

readme file for “Lending Relationships and Optimal Monetary Policy”

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Last Edited: 8/10/2021

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## OVERVIEW

The code in this replication package produces moments used in the calibration, figures used in the paper, and data presented in tables and throughout the body of the paper. The data sources are given in the “Data Availability Section” with instructions on how to download. All data are public at time of publication. The computational and software requirements needed are given below. A description of the folders and programs used and detailed instructions on how to run the programs are also given.

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## DATA AVAILABILITY

Data from the 2003 Survey of Small Business Finances (Federal Reserve Board of Governors, 2013) is used to compute moments used in the calibration procedure used in “globals.jl”. The full dataset and documentation is public and can be downloaded from

<https://www.federalreserve.gov/pubs/oss/oss3/ssbf03/ssbf03home.html>

Federal Reserve Bank of Governors (2003). Survey of Small Business Finances.

[www.federalreserve.gov/pubs/oss/oss3/ssbf03/ssbf03home.html](http://www.federalreserve.gov/pubs/oss/oss3/ssbf03/ssbf03home.html).

*Data on the user cost of MSI-ALL is public and can be downloaded at*

<https://fred.stlouisfed.org/series/OCALLP>

Anderson, Richard G. and Jones, Barry E., Real User Cost Index of MSI-ALL Assets (preferred) [OCALLP], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/OCALLP>, August 18, 2021.

*See Appendix A6 about the details of constructing the variable  $\Delta_{\text{innov\_banked}}$  in `globals.jl`. Sources used are Herrera and Minetti (2007), Giannetti (2012), Drexler and Schoar (2014), and Cosci, Meliciani, and Sabato (2016).*

*Data from FFIEC’s Call Reports is public and can be downloaded at <https://cdr.ffiec.gov/>*

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## COMPUTATIONAL REQUIREMENTS AND RUNTIME

Code was last run on OS: Windows 10 Version 10.0.15063 on 7/27/2021

Julia version 1.5.3 (run on Juno version 0.12.6 using Atom version 1.56.0). Packages needed (*Note: to load required Julia packages, uncomment line 14 from the script “main.jl” that runs the script “pkg\_add.jl”*):

- Roots (v1.2.0)
- Optim (v1.4.1)
- Interpolations (v0.13.4)
- FileIO (v1.10.1)
- DataFrames (v1.2.2)
- CSV (v0.8.5)
- MultivariateStats (v0.8.0)
- Plots (v1.20.0)
- Measures (v0.3.1)
- NLSolve (v4.5.1)
- JLD2 (v0.4.13)
- HDF5 (v0.15.6)
- PyPlot (v2.9.0)

Stata (code was last run with version 14)

Python version 2.7.16 (needed only for matplotlib packaged used for plotting)

- Matplotlib (v2.2.5)

Expected computation time: ~18 hours

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## DESCRIPTION OF FOLDERS AND PROGRAMS

The folders and files included in this zip file are:

- 1) code – folder that contains program files
  - a. main.jl – main program
  - b. globals.jl – defines moments (targets), program parameters, and functions
  - c. calib.jl – holds baseline calibration procedure and function for Section 6
  - d. policy.jl – holds routines to compute optimal policy
  - e. robustness.jl – computes robustness exercises in Appendix A7
  - f. plots.jl – creates figures and outputs to ./figures folder
  - g. pkg\_add.jl – downloads necessary Julia packages
- 2) model data – folder containing model output held in .jld2 files
- 3) figures – folder containing final figures in paper
- 4) moneydemandregressions.do – do file to replicate summary statistics and money demand regressions
- 5) readme.pdf

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## INSTRUCTIONS FOR REPLICATORS

To generate figures and data in 2)-3)

1. Open a terminal window (make sure the Julia command-line is in your PATH, using e.g. “sudo ln –s /Applications/Julia-1.5.app/Contents/Resources/Julia/bin/Julia /usr/local/bin/Julia” and replacing the “1.5” with your current version)
2. Change working directory to the folder with 1)-4)
3. To download the required packages (see below) uncomment line 14 from the script “main.jl” which will run the script “pkg\_add.jl”
4. run “julia ./code/main.jl”

\*The “main.jl” script will automatically output figures in the “figures” folder and model data in the “model data” folder.

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## LIST OF TABLES AND PROGRAMS

1. Table 1, produced in program ./code/calib.jl, line 103
2. Figure 4, produced in program ./code/plots.jl, lines 10-157
3. Figure 5, produced in program ./code/plots.jl, lines 159-409
4. Figure 6, produced in program ./code/plots.jl, lines 412-589
5. Figure 7, produced in program ./code/plots.jl, lines 591-680
6. Figure 8, produced in program ./code/plots.jl, lines 683-818
7. Figure 9, produced in program ./code/plots.jl, lines 821-867
8. Figure 10, produced in program ./code/plots.jl, lines 870-1007
9. Figure 11, produced in program ./code/plots.jl, lines 1010-1330

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## REFERENCES

Cosci, Stefania, Valentina Meliciani, and Valentina Sabato (2016). Relationship Lending and Innovation: Empirical Evidence on a Sample of European Firms. *Economics of Innovation and New Technology*, 25, 335-357.

Drexler, Alejandro and Antoinette Schoar (2014). Do Relationships Matter? Evidence from Loan Officer Turnover. *Management Science*, 60, 2381-2617.

Giannetti, Caterina (2012). Relationship Lending and Firm Innovativeness. *Journal of Empirical Finance*, 19, 762-781.

Herrera, Ana Maria, and Raoul Minetti (2007). Informed Finance and Technological Change: Evidence from Credit Relationships. *Journal of Financial Economics*, 83, 223-269.

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