

## README FILE

Paper: ``From Population Growth to Firm Demographics: Implications for Concentration, Entrepreneurship and the Labor Share''

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The code was last run on a **2-core Intel-based laptop with MacOS version 11.6.**

All data sources are public use data and can be directly downloaded from the websites provided in the References section of this README file. A copy of the data is provided as part of this archive.

### R Files

All R code was run using **R version 3.5.3 (64-bit)**. To run a .R file ensure that you are in the correct working directory and simply run the source file. The main files are in `../replication_material/R code/` and should be run from this folder.

Below we provide a description of each file.

The cleaning file `clean_data.R` should be run before running the other R files.

#### **clean\_data.R**

Cleans BDS data files downloaded from the US Census. The final datasets contain information on average size, exit rates and concentration for

- the aggregate (`bds_f_all_cleaned.csv`)
- by firm age (`bds_f_age0to25plus_cleaned.csv`)
- by sector (`bds_f_sic_cleaned.csv`)
- by firm age x sector. (`bds_f_age0to25plus_sic_cleaned.csv`)

The cleaned csv files are stored in `../replication_material/R code/cleaned` files in folder. These files are then used for the data analysis.

### **makefigs\_Fig2\_Fig3.R**

Uses the cleaned data files to make Figures 2 and 3 in the paper. The figures are saved as pdf files in the `../replication_material/figures` folder.

### **tab1.R**

Run regressions reported in Table 1. The output for each variable is displayed in the R console.

### **tab2\_panelA.R**

Runs regressions reported in Panel A of Table 2. The output for each variable is displayed in the R console.

### **tab2\_panelB.R**

Carries out the calculations reported in Panel B of Table 2. The output for each variable is displayed in the R console.

The files in `../replication_material/R code/raw files` are all BDS tables in .csv format directly downloaded from the website and called by the R files. Further documentation can be found in the BDS website provided in the References section of this README file.

## **Matlab Files**

All Matlab programs were last run on **Matlab R2019a (64-bit)**.

The main files are in `../replication_material/MatlabFiles/code` and should be run from this folder. The correct order to run the files is

1. `main.m`
2. `stationary_alttheories.m`
3. `rts_counterfactual/stationary_hrts.m`
4. `maketables.m`
5. `makefigs.m`

### **feed\_data.m**

This function is called by `main.m`. It takes the model parameters as input, reads the assigned csv file with a labor force growth time series, and returns a structure with various moments of interest.

### **main.m**

Runs the benchmark model, as well as the constant 1978 LFG model and the constant 2014 LFG model and stores the output in benchmark.mat.

### **makefigs.m**

Loads the benchmark.mat file created by main.m to generate Figures 1, 4, 5, 6, 7, 8, 9, and 11 of the paper. All figures are stored as .eps files in the ./replication\_material/figures folder.

### **maketables.m**

Loads the benchmark.mat file created by main.m, the alteqbm\_bench.mat, alteqbm\_lpop.mat, alteqbm\_lrow.mat, alteqbm\_hentry.mat files created by the stationary\_alttheories.m file, and the alteqbm\_hrts.mat file created by the rts\_counterfactual/stationary\_hrts.m file to generate Tables 3, 4, 5, and 6 of the paper.

### **n.m**

This is the maximized firm employment function used by various .m files.

### **prof\_fn.m**

This is the maximized firm profit function used by various .m files.

### **stationary.m**

This function takes model parameters as input, solves for the stationary equilibrium, and returns a structure with the results. It is called by main.m. The solution method used takes zstar equal to 1 as given and solves for the entry cost as a residual from the entry market condition.

### **stationary\_alt.m**

This function takes model parameters as input solves for the stationary equilibrium, and returns a structure with the results. It is called by stationary\_alttheories.m. The main difference with stationary.m is that this code solves for zstar rather than taking it as given.

### **stationary\_alttheories.m**

Solves the 'higher entry cost', the 'decrease in mean reversion', as well as the 'our model no transition' models stores the output in alteqbm\_bench.mat, alteqbm\_lpop.mat, alteqbm\_lrow.mat, and alteqbm\_hentry.mat.

### **tauchen2.m**

This function discretizes the AR(1) process for two types. The output is a grid of productivities and two transition matrices used by various .m files.

### **vfn.m**

This function performs the value function iteration used by various .m files.

### **zstar\_fun.m**

This function takes entry cost as given and solves for zstar. It is used when solving for alternative models.

### **rts\_counterfactual/stationary\_hrts.m**

This function solves the 'higher returns to scale for high type' model in the alternative models section. A separate code was needed for this as it requires to keep track of the distribution of high type and low type separately.

**rts\_counterfactual/n.m**, **rts\_counterfactual/prof\_fn.m**, **rts\_counterfactual/zstar\_fun.m**, **rts\_counterfactual/tauchen2.m**, and **rts\_counterfactual/vfn.m** are adapted versions of these same files above to be used in the 'higher returns to scale' model.

The files in `./replication_material/MatlabFiles/data_summary_stats` are all .csv files called with summary statistics calculated by the authors from various sources cited in the paper and called by the various Matlab files above. A description of each file is provided below.

- `avgfsize.csv`: Time series of average firm size in BDS from 1978 to 2014
- `entranttoemp.csv`: Time series of the ratio of new firms to total employment in BDS from 1978 to 2014
- `exit_rate.csv`: Time series of firm exit rate in BDS from 1978 to 2014
- `fagedist.csv`: Contains the firm age distribution (both firm share and employment share) in BDS data in 1978 and in 2014.
- `fsizeempdist.csv`: Contains the firm size distribution (both firm share and employment share) in BDS data in 1978 and in 2014.
- `laborshare_KSZ.csv`: Contains the labor share in Koh, Santaaulalia-Llopis, and Zheng (2020). Retrieved from the paper's replication materials available at <https://onlinelibrary.wiley.com/doi/full/10.3982/ECTA17477>
- `laborshare.csv`: Contains the labor share in Karabarounis and Neiman (2014). Retrieved from the paper's replication materials available at <https://sites.google.com/site/loukaskarabarounis/research>
- `shareemp_250plus.csv`: Time series of share of employment by firms size 250 or above in BDS from 1978 to 2014

- startup\_rate\_1940\_1960.csv: Time series of the entry rate in the Survey of Current Business from 1940 to 1962.
- startup\_rate.csv: Time series of the firm entry rate in BDS from 1978 to 2014
- US\_laborforce\_norise.csv: Counterfactual constant labor force growth series equal to the 1978 labor force growth rate from 1851 to 2014.
- US\_laborforce\_notransition.csv: Counterfactual constant labor force growth series equal to the 2014 labor force growth rate from 1851 to 2014.
- US\_laborforce.csv: Labor force growth series from 1940 to 2014 in Lebergott (1964) and BLS' Current Population Survey.

## References

Bureau of Labor Statistics (BLS), "Current Population Survey," (2018), <https://www.bls.gov/cps/aa2019/cpsaat01.htm>, (accessed April 1, 2018).

Karabarbounis, L. and B. Neiman, "Replication Material to: The Global Decline of the Labor Share," *The Quarterly Journal of Economics* 129 (2014), 61–103, <https://sites.google.com/site/loukaskarabarbounis/research> (last accessed on January 2022).

Koh, D., R. Santaeulàlia-Llopis and Y. Zheng, "Replication Material to: Labor Share Decline and Intellectual Property Products Capital," *Econometrica* 88 (2020), 2609–2628, <https://onlinelibrary.wiley.com/doi/full/10.3982/ECTA17477> (last accessed on January 2022).

Lebergott, S., *Manpower in Economic Growth: The American Record Since 1800* (McGraw-Hill Book Company, 1964)

U.S. Census Bureau, "Business Dynamics Statistics (BDS)," (2018), [https://www.census.gov/ces/dataproducts/bds/data\\_firm.html](https://www.census.gov/ces/dataproducts/bds/data_firm.html) (accessed April 1, 2018).

U.S. Department of Commerce, "Survey of Current Business," (1921-2014), <https://fraser.stlouisfed.org/title/46> (accessed April 1, 2018).