

# Jobs and Matches: Quits, Replacement Hiring, and Vacancy Chains —Replication Notes

Yusuf Mercan and Benjamin Schoefer\*

July 10, 2019

The main directory contains four subfolders.

1. Model: Contains MATLAB code that estimates and simulates the model, and plots model generated figures.
  - (a) The folder contains user written functions for formatting figures for publication contained under *./Model/export\_fig-master*.
  - (b) The code uses some functions from the CompEcon Toolbox written by Paul Fackler and Mario Miranda. It is available at <https://pfackler.wordpress.ncsu.edu/compecon/154-2/>. The specific functions used (*dprod.m*, *goldenx.m* and *optget.m*) are included in the replication folder.
2. Data Plots: Contains MATLAB code that plots empirical figures.
3. Stata:
  - (a) Contains Stata code that creates .csv files read by MATLAB to plot the empirical time series figures.
  - (b) It also contains a subfolder IAB\_Confidential\_Data, which contains the Stata code for the analysis of the German confidential firm survey data.
4. Data: Contains data used in the paper. Also serves as a directory where intermediate datasets are saved.

## 1 Model

*mainCode.m* is the main file the reader should start from.

1. The code first estimates the model. The reader can set variable *calibrate\_baseline* to 1 to estimate the baseline model in the main text. To solve the model with endogenous search and heterogenous match quality, the reader should set *calibrate\_extended* to 1 instead. The outcome of the estimation in each case is a .txt file including the resulting parameter values as well as the objective function value.

---

\*For questions please contact [yusuf.mercan@unimelb.edu.au](mailto:yusuf.mercan@unimelb.edu.au)

2. Once the estimation is complete, the code solves for the steady state of the model.
3. The next section computes the perfect-foresight transition dynamics of the model following various one-time unanticipated shocks and plots the resulting impulse responses. As explained in the paper, there are different scenarios under which the impulse responses are computed:
  - (a)  $Cost = 'c(v)'$  or  $'c(n)'$  determines whether the vacancy stock or only newly created vacancies enter the sunk vacancy creation cost function.
  - (b)  $repost$  determines whether there is vacancy reposting above and beyond the steady state value.  $repost=1$  means that repostings are constrained to be the same as in steady state, and  $repost=0$  means that repostings follow the full equilibrium dynamics of the model.
4. The final part of the code plots figures related to the vacancy multiplier and its decompositions.

## 2 Replicating Figures

**Figure 1**

- Panel (a): Run `./Data Plots/PlotIABVacancy.m`
  - Uses numbers contained in `./Data/IAB_Data/iab.xlsx`.
  - The Excel sheet is a compilation of publicly accessible aggregate time series data of the IAB Vacancy Survey (IAB Stellenerhebung), described in the main text, and accessible via:  
[https://fdz.iab.de/de/FDZ\\_Establishment\\_Data/](https://fdz.iab.de/de/FDZ_Establishment_Data/) (IAB\_Job\_Vacancy\_Survey/IAB\_SE0015.aspx (German) and  
[https://fdz.iab.de/en/FDZ\\_Establishment\\_Data/IAB\\_Job\\_Vacancy\\_Survey/IAB\\_SE0015.aspx](https://fdz.iab.de/en/FDZ_Establishment_Data/IAB_Job_Vacancy_Survey/IAB_SE0015.aspx) (English). Aggregate counts are presented in “Auszahlungen”.
  - Matlab code `plotIABVacancy.m` also generates Appendix Figure A1 Panel (a) (time series of vacancy composition).
- Panel (b):
  - The coefficient plot reports point estimates and confidence intervals based on regressions in the confidential establishment survey data from Germany. The establishment survey is the Linked-Employer-Employee-Data of the IAB (LIAB), with information here:  
[https://fdz.iab.de/en/Integrated\\_Establishment\\_and\\_Individual\\_Data/LIAB.aspx](https://fdz.iab.de/en/Integrated_Establishment_and_Individual_Data/LIAB.aspx).
  - Regressions were conducted in a secure data research center in May 2015. Data access for on-site research can be obtained by application, following the steps outlined by the Research Data Center of the IAB (Forschungsdatumzentrum) on the following link:  
[https://fdz.iab.de/en/FDZ\\_Data\\_Access/FDZ\\_On-Site\\_Use.aspx](https://fdz.iab.de/en/FDZ_Data_Access/FDZ_On-Site_Use.aspx)
  - The underlying Stata `.do` files are XXXX.do.
- Panel (c), (d), (e): Run `./Data Plots/plot_JOLTS_LTS_NBER.m`

## Figure 2

- Panel (a), (b), (c): First run `./Stata/time_series_jolts_counterfactual.do` then run `./Data Plots/plotCounterfactualSeries.m`
- Panel (d): Run `./Stata/f_quit.do` and then run `./Data Plots/plotFQuits.m`

## Figure 3

- Panel (a): This is generated running `./Model/mainCode.m`, which internally calls function `./Model/plotCrowdout.m`.
- Panel (b): The construction of the estimates is detailed in the figure note.

## Figure 4

Figure 4 panels are generated within `./Model/mainCode.m` at the very end, after the estimation is done and the transition paths are solved.

## Figure 5

Figure 5 panels are generated within `./Model/mainCode.m`. For each shock, after the transition path is solved, `mainCode.m` internally calls function `./Model/plotIRFFigures.m` to generate impulse responses of various endogenous variables in the model.

## German Establishment Survey: Figure 1 Panel (b), Appendix Tables A1,2, Appendix Figure A1 Panel (b)-(f)

- Appendix Tables A1,2 report point estimates and confidence intervals based on regressions in the confidential establishment survey data from Germany. Figure 1 Panel (b) plots the estimates from Appendix Table A.2 Column (4) right column. Appendix Figure A1 Panels (b)-(f) plot binned scatter plots from the establishment survey against regional unemployment variation.
- The establishment survey is the Linked-Employer-Employee-Data of the IAB (LIAB), as of the 2015 “version 2” (matched employer-employee version), with detailed information here:  
[https://fdz.iab.de/en/Integrated\\_Establishment\\_and\\_Individual\\_Data/LIAB.aspx](https://fdz.iab.de/en/Integrated_Establishment_and_Individual_Data/LIAB.aspx).
- Regressions were conducted in a secure data research center in May 2015. Data access for on-site research can be obtained by application, following the steps outlined by the Research Data Center of the IAB (Forschungsdatumzentrum) on the following link:  
[https://fdz.iab.de/en/FDZ\\_Data\\_Access/FDZ\\_On-Site\\_Use.aspx](https://fdz.iab.de/en/FDZ_Data_Access/FDZ_On-Site_Use.aspx)
- The underlying Stata .do files are in Stata subfolder IAB\_Confidential\_Data.
  - Stata .do file `master.do` establishes (to be adjusted depending on local data structure and project name) path names and calls on the subsequent two programs.
  - Stata .do file `prepare_estsurvey.do` prepares the establishment survey panel data and also generates local unemployment rates. It draws on worker-level data set associated with the LIAB version of the data (confidential), and on IAB-provided local unemployment counts. It finally draws on the establishment survey panel data set (confidential).

- Stata .do file *IAB\_LIAB\_results.do* draws on the prepared establishment data set (generated in *prepare\_estsurvey.do*) and conducts the empirical analyses resulting in Figure 1 Panel (b), Appendix Tables A1,2, Appendix Figure A1 Panel (b)-(f). Commentary and full code is provided in the .do files.

### **Appendix Figure A3**

Figure A3 panels are generated within *./Model/mainCode.m*, as in main paper Figure 5, but using the extended model from Appendix , as described in the code.

### **Appendix Figure A4**

Figure A4 panels are generated within *./Model/mainCode.m*, as in main paper Figure 4, but using the low-crowd out calibration, as described in the code.

### **Appendix Figure A5**

Figure A5 panels are generated within *./Model/mainCode.m*, as in main paper Figure 5, but using the low-crowd out calibration, as described in the code.