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Abstract

Data and replication instructions for “Anticipated Productivity and the Labor Market,” conditionally accepted at *Quantitative Economics*.

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Data Availability and Provenance

Below we describe how we obtained all data used in the paper. The FRED data series were downloaded directly with MATLAB using the program `Code/do_FredData.m` which requires MATLAB’s Datafeed Toolbox (<https://www.mathworks.com/products/datafeed.html>). All other data series were downloaded manually from the relevant websites, as we describe in detail below. Copies of all data accessed and prepared for analysis in `Code/do_data.m` have been saved in `Code/data`. ASCII files containing the raw data series are also provided in the directory.

We summarize these files in a table below after describing how they are obtained. For details on how we use this underlying data to construct the variables used in our analysis, see `Code/do_data.m` and the Online Appendix.

1. Aggregate macroeconomic data were downloaded from the FRED database maintained by the Federal Reserve Bank of St. Louis (<https://fred.stlouisfed.org>). The variables used are gross domestic product (FRED code GDP), non-durables consumption (PCND), services consumption (PCESV), durables consumption (PCDG), gross private domestic investment (GPDI), GDP deflator (GDPDEF), non-institutional population (CNP16OV), total non-farm employment (PAYEMS), the unemployment rate (UNRATE), the unemployment level (UNEMPLOY), the level of short-term unemployment (UEMPLT5), the civilian labor force (CLF16OV), non-farm business sector hours (HOANBS), total non-farm hires (JT-SHIL), and research and development (Y694RC1Q027SBEA). All of these series are saved in `Code/data/fred_data.mat`. Downloaded on September 28, 2022.
2. The NYSE stock return was downloaded from the CRSP database via WRDS (<https://wrds-www.wharton.upenn.edu>). Access to this dataset requires a subscription. A copy of the data is saved in `Code/data/wrds_crisp.xlsx`. Downloaded on June 4, 2019.
3. The 19 wage series in Figure 2 of the main text were obtained from the following sources:

The BEA compensation per hour series is derived from the BEA NIPA data, downloaded from https://apps.bea.gov/iTable/index_nipa.cfm. Specifically, after navigating to the URL above, first click “Begin using the data...,” followed by “view data in XLS or other formats,” and finally “Section 2 Personal Income and Outlays” to download the Excel file that can

be found in our archive, `Code/data/Section2All_xls.xlsx`. Downloaded on December 10, 2019.

The CPS median weekly earnings series is obtained from FRED (LES1252881500Q) and is saved in `Code/data/fred_data.mat`. Downloaded on September 28, 2022.

The Basu-House new-hire wage data can be downloaded from <https://data.nber.org/data-appendix/w22279/> by clicking on `wages.xlsx`, and is saved in `Code/data/wages.xlsx`. Downloaded on December 2, 2019.

The remaining 16 CES Sectoral Wage Series are obtained from FRED, with FRED codes listed in Table II.2 of the Online Appendix. These series are saved as `Code/data/fred_data.mat`. Downloaded on September 28, 2022.

4. Our baseline measure of aggregate utilization-adjusted TFP, as well as our measures of raw (unadjusted) TFP and labor productivity, were downloaded from the Federal Reserve Bank of San Francisco at <https://www.frbsf.org/economic-research/indicators-data/total-factor-productivity-tfp/> by clicking on the link “Download latest data”. A copy of this data is saved in `Code/data/quarterly_tfp_update.xlsx`. The file used in the paper was last updated by John Fernald on September 5, 2019 and downloaded on November 12, 2019.
5. The technological standards index was downloaded from the publicly available data repository on Justus Baron’s website, <https://justusbaron.org/data/>, by clicking on the link “Standard_series_33_35_US”. A copy of this data is saved in `Code/data/auxdata_baronschmidt.xlsx`. Downloaded on April 14, 2020.
6. The vacancies series was obtained from the composite help-wanted index on Regis Barnichon’s personal website, <https://sites.google.com/site/regisbarnichon/research>, by clicking on the link “Data: Composite Help-Wanted Index” and downloading the Excel file. A copy of this data is saved in `Code/data/CompositeHWI.xlsx`. Downloaded on March 22, 2022.

Dataset List

File	Location	Source	Series	Provided?
<code>fred_data.mat</code>	<code>Code/data</code>	FRED	Basic aggregates; wages	Yes
<code>wrds_crisp.xlsx</code>	<code>Code/data</code>	CRSP	Stock price	Yes
<code>Section2All_xls.xlsx</code>	<code>Code/data</code>	BEA	Hourly compensation	Yes
<code>Wages.xlsx</code>	<code>Code/data</code>	NBER	New hires wage	Yes
<code>quarterly_tfp_update.xlsx</code>	<code>Code/data</code>	FRB-SF	TFP measures	Yes
<code>auxdata_baronschmidt.xlsx</code>	<code>Code/data</code>	Justus Baron	Tech. standards	Yes
<code>CompositeHWI.xlsx</code>	<code>Code/data</code>	Regis Barnichon	Vacancies	Yes
<code>monthly_data.tsv</code>	<code>Code/data</code>	Multiple above	Monthly Raw Series in ASCII	Yes
<code>quarterly_data.tsv</code>	<code>Code/data</code>	Multiple above	Quarterly Raw Series in ASCII	Yes

Instructions for Replication of All Results

Below we describe all relevant information for replication of our results, including the structure of the replication files, software and hardware requirements, and how to implement the replication.

Code structure

All replication files may be found in the directory `Code`.

Within the `Code` directory, the MATLAB script `run_all.m` replicates all results in the paper. This script has five main sections: (i) “Setup” (clears MATLAB variables, adds relevant directories for helper files, and sets options for figures); (ii) “Load data from FRED” (fetches data from FRED via `do_FredData.m`—this is currently commented since it does not need to be called again because all data from FRED are saved in `Code/data`); (iii) “Construct data and estimate VARs” (constructs empirical results for Section 2 and Online Appendix III for various specifications); (iv) “Estimate models with different wage assumptions” (estimates versions of the model with the agnostic wage, the flow wage, and the Nash wage using the empirical VAR results); and (v) “Generate figures & tables” (generates all figures and tables in the Manuscript and Online Appendix).

Also within the `Code` directory, the folder `data` contains all data sources (as described above), the folder `DSGE_tools` contains tools for solving the model, the folder `ts_box` contains tools for time series analysis, and the folder `latex` contains tools for constructing tables formatted for L^AT_EX.

Software

This code was last run/tested on Mac OSX 12.5 using MATLAB R2022b. The code requires MATLAB's Symbolic Toolbox, Optimization Toolbox, Parallel Computing Toolbox, Econometrics Toolbox, and Statistics and Machine Learning Toolbox. Original download of FRED data via `Code/do_FredData.m` (which is commented out in `Code/run_all.m`) also used MATLAB's Datafeed Toolbox. No additional toolboxes are needed to replicate the results.

Hardware

These programs have no special hardware requirements. The code was most recently run on an 8-core 2019 Macbook Pro.

“1-click” replication, including all figures & tables

To replicate all results from the underlying data and generate all tables and figures in the paper, call:

```
>> run_all
```

from the `Code` directory. Full execution of this code will take roughly five minutes to complete on an 8-core computer using MATLAB's Parallel Computing toolbox. All tables and figures are saved to `Tex/figures_output`. The Beveridge curve slope results are printed to the screen.

Figure/Table Correspondance

Figure	Source File
Figure 1	figures_output/figure1.eps
Figure 2	figures_output/figure2.eps
Figure 3	figures_output/figure3.eps
Figure 4	figures_output/figure4.eps
Figure 5	figures_output/figure5.eps
Figure 6	figures_output/figure6.eps
Figure 7	figures_output/figure7.eps
Figure 8	figures_output/figure8.eps
Figure 9	figures_output/figure9.eps
Figure 10	figures_output/figure10.eps
Figure 11	figures_output/figure11.eps
Figure I.1	figures_output/figure_q_nash.eps
Figure III.2	figures_output/figure_var_short.eps
Figure III.3	figures_output/figure_model_inflation.eps
Figure III.4	figures_output/simulation_var.eps

Table	Source File
Table 1	figures_output/vd.text
Table 2	figures_output/params_calib.text
Table 3	figures_output/params_agno.text
Table 4	figures_output/params_flow.text
Table I.1	figures_output/params_nash.text
Table II.2	figures_output/wage_series.text
Table III.3	figures_output/vd_td.text
Table III.4	figures_output/vd_theory.text