README for *"When Does Mandatory Price Disclosure Lower Prices? Evidence from the German Fuel Market"* by Felix Montag, Alina Sagimuldina, and Christoph Winter

Overview

This file contains instructions on how to replicate the analysis in the main article and the Online Appendix.

The do-file 00_master.do runs all the code necessary to replicate the empirical analysis. The Julia script 20_Model simulation.jl runs the code necessary to replicate the model simulations in Figures 1, 2, A1, and A2.

The replication folder is organized as follows:

- 01_raw_data contains all raw data, which is organized into folders thematically.
- 02_code includes all the code, where any table or figure in the paper is replicated in the do-file that contains the table / figure name in its title.
- 03_dta contains intermediate data sets. This folder can be empty pre-replication.
- 04_output contains the output tables / figures in the paper. This folder can be empty pre-replication.

Steps for replication

Data availability and data access

Station-level prices for Germany before the introduction of mandatory price disclosure were provided by mehr-tanken.de, which is an information service provider allowing consumers to self-report petrol prices. Researchers interested in this data can contact mehr-tanken.de directly.

The user search data was provided by Tankerkönig. Researchers interested in this data can contact Martin Kurz at mkurz@tankerkoenig.de.

All other data is publicly available and part of the replication package.

Do-file structure for replication of empirical analysis

All do-files for replication of the empirical analysis are included in the subfolder 02_code. The do-file 00_master.do specifies the paths in which the data are located and outputs should be saved, installs all packages necessary to run the analysis that are not part of the standard Stata 17 installation, and calls all the other files necessary for the analysis.

Do-files 1_ to 11_ load and process the different data sets and prepare them for the subsequent analyses. Do-files 12_ to 19_ carry out the analysis and produce the different output tables and figures. The file name of every do-file specify which tables

/ figures are being produced in that file (e.g., 12_Summary_statistic_Table1andB1.do produces Table 1 and Table B1).

Conditional on obtaining the proprietary data on pre-MPD prices in Germany from mehr-tanken.de and the search data from Tankerkönig, replicators can run the entire analysis by:

1) Adapt the paths in 00_master to their own machine's path.
2) Run the commented-out installation of any Stata packages that they may not have installed once.
3) Run the commented-out installation of the osrmtime package (to calculate shortest distances using the road network) once.
4) Run the commented-out preparation of the road maps for Germany and France using osrmprepare.
5) Run the remaining code in 00_master that calls all do-files that replicate the empirical analysis in our paper.

Computational requirement

The code for the empirical analysis was run on a 2-core (2 processor) Intel Xeon Platinum 8160 CPU @ 2.10GHz server with 32GB RAM and took about 4 days to run.

We ran the analysis using Stata 17. Most additional packages required for the analysis can be installed from the Boston College Statistical Software Components (SSC) archive. Code that installs all these packages is included in the do-file 00_master.do.

The osrmtime package is not available via SSC and needs to be installed manually. 00_master.do includes code that installs osrmtime using the installation files in 01_raw_data/07_Osrm.

Reproducing the model simulation (Figures 1, 2, A1, and A2) requires running the script in 20_Model simulations.jl in Julia. The script is self-contained and requires loading the following packages: Plots, QuadGK, and LaTeXStrings.

Data sources

1) 01_Mehr_Tanken: Station-level price data notified by app users to the app mehr-tanken.de for September 2012 until September 2013. Unavailable as part of the replication package (see above for data access).
2) 02_Other_Datasets:
    a. 20180427_MWV_Spritbeschaffungskosten_Steuern.xlsx: Monthly taxes and input prices for gasoline and diesel in Germany from the Mineralölwirtschaftsverband (link to source in file).
    b. 31122013_Auszug_GV.xlsx: Excerpt from the municipal register in Germany based on the 2011 Census, provided by the German Statistical Office.
    c. Abbildung11_Bundestagsbericht_daten.xls: Transcription of data in Figure 11 of German Ministry for Economic Affairs and Energy (2018).

   d. Google Trends_multiTimeline.csv: Google trends search intensity for different search terms (see file) between January 2013 and to December 2014.
   e. Nutzungszahlen_apps.xlsx: App usage intensity data from the Informationsgemeinschaft zur Feststellung der Verbreitung von Werbeträgern e.V. Downloaded from http://www.ivw.de.
   f. Oil_Bulletin_Prices_History.xlsx: Historical weekly prices on country-level fuel prices and taxes for different European countries from https://energy.ec.europa.eu/data-and-analysis/weekly-oil-bulletin_en.
   g. RBRTEd.xlsx: Europe Brent Spot Price FOB in Dollars per Barrel (daily) from the U.S. Energy Information Administration. Link to data in file.
   h. Station_Information_20150906.xlsx: Addresses and coordinates for every German fuel station by fuel station ID.
   i. Wechselkurs_euro-dollar.xlsx: Euro / Dollar exchange rate from the European Central Bank.
   j. ZipAGSlist.xlsx: mapping of zip codes to municipality identifiers in Germany.
   k. Zuordnung_plz_ort.xlsx: Mapping of open street map IDs to zip code.
3) 03_TankenTanken: Station-level price data for October 2013 until December 2014 reported to market transparency unit (MTU) by fuel stations in Germany and made available by TankenTanken.
4) 04_France_prices:
   a. France_ZIP codes.xlsx: List matching ZIP codes in France to regions.
   b. Frankreich_Steuern und Abgaben_diesel.xlsx: taxes on diesel by region in France including sources.
   c. Frankreich_Steuern und Abgaben_petrol.xlsx: taxes on gasoline by region in France including sources.
   d. PrixCarburants_annuel_2013.dta: Extracted relevant price information from xml files downloaded from https://www.prix-carburants.gouv.fr/rubrique/opendata/ and converted to dta.
   e. PrixCarburants_annuel_2014.dta: Extracted relevant price information from xml files downloaded from https://www.prix-carburants.gouv.fr/rubrique/opendata/ and converted to dta.
5) 05_Coordinates: maps and shapefiles extracted from OSM maps by osrmprepare.
6) 06_Germany_osrm_map: OSRM map downloaded from https://download.geofabrik.de/europe/germany.html. All other files based on files that osrmprepare extracted from Germany-latest.osm.pbf file.
7) 07_Osrm: osrmtime package downloaded from https://github.com/christophrust/osrmtime.
8) 08_Germany_radio:
   a. 20180302_DE_stationlist.csv: Transmitters and reception area for every radio station in Germany provided by https://www.fmlist.org/ul_login.php.
   b. Radioberichte über Tankstellenpreise.xlsx: Hand-collected radio reports about fuel prices.
9) 09_France_osrm_map: OSRM map downloaded from https://download.geofabrik.de/europe/france.html. All other files based on files that osrmprepare extracted from France-latest.osm.pbf file.

10) 10_Consumer_search: Search queries of users of Tankerkönig for January until May 2015, as well as October until December 2015 including location of search, fuel type search, searcher ID. Unavailable as part of the replication package (see above for data access).