

Replication material

for Schoder and Tercioglu (2023): “A Climate-Fiscal Policy Mix to Achieve Turkiye's Net-Zero Ambition under Feasibility Constraints.” Policy Research Working Paper 10551. World Bank Group.

Overview

This folder contains all scripts and datasets required to replicate the tables and figures in the working paper using R-Studio and Dynare for Matlab. There are two steps: First, the “Turkey_data.Rmd” file in the “data”-folder compiles the dataset from a raw data file. Second, the “main.m”-file executes all necessary routines sequentially. Intermediate output is produced which is used by subsequent routines. The final results are stored in the “output” folder. The file names indicate the corresponding figures in the paper. The “main.m”-file includes more information.

Caveat

The Matlab script employs Monte-Carlo simulation methods with quasi-random seeds which lead to minor numerical deviations across runs on different CPUs. Therefore, plots may slightly deviate from those in the paper. The selection of parameters in Figure B2 may differ from that in the paper.

Erratum

There is a typo in Table B5. It incorrectly reports the prior mean for the “windfall profit shock for energy firms” as 0.1. It is 0.01 in the script.

Data Availability and Provenance Statement

All data is publicly available. The raw data and data sources can be found in "data/Turkey_data.xls".

Variable Name	Description
NAEXKP01TRQ661S	FRED: Gross Domestic Product by Expenditure in Constant Prices: Total Gross Domestic Product for Turkey, Index 2015=100, Quarterly, Seasonally Adjusted
NAEXKP02TRQ661S	FRED: Gross Domestic Product by Expenditure in Constant Prices: Private Final Consumption Expenditure for Turkey, Index 2015=100, Quarterly, Seasonally Adjusted
NAEXKP04TRQ661S	FRED: Gross Domestic Product by Expenditure in Constant Prices: Gross Fixed Capital Formation for Turkey, Index 2015=100, Quarterly, Seasonally Adjusted
NAEXKP03TRQ661S	FRED: Gross Domestic Product by Expenditure in Constant Prices: Government Final Consumption Expenditure for Turkey, Index 2015=100, Quarterly, Seasonally Adjusted

TURGDPDEFQISMEI	FRED: GDP Implicit Price Deflator in Turkey, Index 2015=100, Quarterly, Seasonally Adjusted
NAEXKP06TRQ661S	FRED: Gross Domestic Product by Expenditure in Constant Prices: Exports of Goods and Services for Turkey, Index 2015=100, Quarterly, Seasonally Adjusted
NAEXKP07TRQ661S	FRED: Gross Domestic Product by Expenditure in Constant Prices: Less: Imports of Goods and Services for Turkey, Index 2015=100, Quarterly, Seasonally Adjusted
LFEMTTTTTRQ647S	FRED: Employed Population: Aged 15 and Over: All Persons for Turkey, Persons, Quarterly, Seasonally Adjusted (2005 was completely missing I linearly interpolated the missing values)
Unemployment	TUIK, seasonally adjusted
IRSTCI01TRM156N	FRED: Immediate Rates: Less than 24 Hours: Call Money/Interbank Rate for Turkey, Percent, Quarterly, Not Seasonally Adjusted
RBTRBIS	FRED: Real Broad Effective Exchange Rate for Turkey, Index 2010=100, Quarterly, Not Seasonally Adjusted
COMP	TUIK: Current price compensation of employees, seasonally adjusted (Unit: Thousand Turkish Liras)
IRLTLT01EZM156N	FRED: Long-Term Government Bond Yields: 10-year: Main (Including Benchmark) for the Euro Area, Percent, Quarterly, Not Seasonally Adjusted
ENRGY0TRM086NEST	FRED: Harmonized Index of Consumer Prices: Energy for Turkey, Index 2015=100, Quarterly, Not Seasonally Adjusted
00XE00TRM086NEST	FRED: Harmonized Index of Consumer Prices: Overall Index Excluding Energy for Turkey, Index 2015=100, Quarterly, Not Seasonally Adjusted
Investment Public	TUIK: in 1998 prices (seasonally and calendar adjusted)
Investment Private	TUIK: in 1998 prices (seasonally and calendar adjusted)
O	World Bank: CO2 emissions (kt)
PRENTO01TRQ661S	FRED: Total Energy Production for Turkey, Index 2015=100, Quarterly, Seasonally Adjusted
EU GDP per capita	Eurostat: Chain linked volumes, quarterly, Index 2010=100, per capita (Not seasonally adjusted)
EU Export Price Deflator	Eurostat: Price index (implicit deflator), 2010=100, euro, seasonally adjusted
EU GDP deflator	Eurostat: Price index (implicit deflator), 2010=100, euro, seasonally adjusted
FRED: TURLOCOSTORSTM	Leading Indicators OECD: Component series: Short-term interest rate: Original series for Turkey, Percent, Quarterly, Not Seasonally Adjusted

CP0000TRM086NEST	FRED: Harmonized Index of Consumer Prices: All Items for Turkey, Index 2015=100, Quarterly, Not Seasonally Adjusted
Fossil fuel supply	IEA: total fossil fuel energy supply (PJ)
Renewable supply	IEA: total renewable energy supply (PJ)
Household energy consumption	IEA: total final household (residential+public) energy consumption (PJ)
Firm energy consumption	IEA: total final firm (industry+transportation) energy consumption (PJ)
Fossil_energy_price_consumers	IEA: Weighted average of coal, gas and oil prices for consumers (unit: national currency per MWh)
Fossil_energy_price_producers	IEA: Weighted average of coal, gas and oil prices for producers (unit: national currency per MWh)
Core goods capital stock	WIOD: Nominal capital stock
Energy capital stock	WIOD: Nominal capital stock
OECD_pO_price	IEA: Average gas and oil producer price in OECD (unit: 2015 USD per MWh)
BSCURT02TRM160S	FRED: Business Tendency Surveys for Manufacturing: Capacity Utilization: Rate of Capacity Utilization: European Commission and National Indicators for Turkey, Percent, Quarterly, Seasonally Adjusted
INTDSRTRM193N	FRED: Interest Rates, Discount Rate for Turkey, Percent per Annum, Quarterly, Not Seasonally Adjusted
LCEAMN01TRQ657S	FRED: Hourly Earnings: Manufacturing for Turkey, Growth rate previous period, Quarterly, Seasonally Adjusted
HOHWMN02TRQ661N	FRED: Weekly Hours Worked: Manufacturing for Turkey, Index 2015=100, Quarterly, Not Seasonally Adjusted
PiL_min	TUIK: Mining gross wages
PiL_con	TUIK: Construction gross wages
PiH_fin	TUIK: Finance gross wages
PiH_IT	TUIK: information services gross wages
BG	Public sector net debt from Turkish Ministry of Treasury and Finance (in Billions of TL)

Software Requirements and Runtime

The data compilation requires R-Studio (version 2022.07.2 or newer). Model estimation and simulation require Dynare (version 5.0 or newer) for Matlab (version R2022a or newer). The overall run time is approximately 84 hours. Details on the runtimes of each step in the estimation/simulation are provided in the "main.m"-file.