Read Me

Ryan Chahrour[*] Rosen Valchev[†]

Boston College Boston College

October 1, 2021

Abstract

Data and replication instructions for *Trade Finance and the Durability of the Dollar* published in the <u>Review of Economic Studies</u>.

---
[*]Department of Economics, Boston College, Chestnut Hill, MA 02467, U.S.A. *e-mail*: valchev@bc.edu
[†]Department of Economics, Boston College, Chestnut Hill, MA 02467, U.S.A. *e-mail*: ryan.chahrour@bc.edu

Instructions for Replication of Model Solutions:

Software:

This code was last run/tested in Mac OSX 10.14 using Matlab R2020a. The code has also been tested on Windows 10, Matlab release R2020a. The code requires Matlab's Symbolic and Parallel Computing Toolboxes, as well as an installed/supported mex C compiler. (See detailed notes below.) No additional toolboxes are needed to replicate the results here.

Hardware:

These programs have no special hardware requirements. Running the full replication code takes about 1 hour on an 8-core 2019 Intel Macbook Pro. Replication times on Windows are somewhat longer.

Quick-start Guide:

- All figures and tables can be reproduced from saved results by calling:

  ```
  >> run_all
  ```

  from the root directory.

- To replicate all the computations used in these figures, change line 12 of `run_all.m` to `scratch=true;` and again call

  ```
  >> run_all
  ```

  from the root directory.

Additional details on code structure and function

The main replication files are all contained in the root directory. Helper functions are stored in directories labeled `/mex_tools` and `/DSGE_tools`. The code relies on automatically-generated m-files and mex files. These files are stored in `/auto_generated`; versions of all automatically generated files are included with this repository. Templates for automatically-generated files are found in the `/tofill_files` directory.

- The file `run_all.m` calls each computational step in a self-contained Matlab code "cell", with comments describing what is happening. This makes it possible to reproduce each calculation/result by selecting the corresponding cell and pressing "command+enter".

- The file `simplify_expressions.m` contains symbolic versions of all mode equilibrium conditions. This file generates symbolic versions of these equations, and performs several substitutions that speed up computation. The main outputs are `resid_ss_mex.c` and `resid_dyn_mex.c`, which compute residuals to the model equilibrium conditions in the steady state or in transition respectively. This command also computes many auxiliary quantities and compiles the required mex programs.

- If you have not used mex-functions before, setup on the latest Mac OS X is much easier than in the old days. Download Xcode from the Mac App store and *open it once*, waiting for all components to install. Then, start matlab and call `>> mex -setup`. Mex functions should now compile when you call e.g. `>> simplify_expressions`.

  On Windows, follow the instructions here to install the free MinGW compiler.

- The file `steady_solve.m` finds the steady state of the economy for the baseline and several other parameterizations of the model. This file calls `steady_state_finder.m`, which searches for a steady state by experimenting with many initial allocations of bond holdings. Considering a fine grid of starting values help the procedure to uncover multiple steady states when they exist. The file `disp_steady.m` displays many steady-state quantities from the current output of `steady_solve.m`.

- The file `shooting.m` uses the above mex code to compute the residuals for a conjectured dynamic path of the economy. The program `shooting_solve.m` attempts to solve the perfect foresight path of the economy by zeroing out the residuals returned by `shooting.m`. We refer to shooting solutions as "flight paths" throughout the code comments.

- The file `attraction_regions.m` follows a wide grid of initial points and looks for perfect foresight paths that converge to each possible steady state. It keeps track of whether the search is successful or not, and uses homotopy to get the best starting points to be sure that possible solutions are not overlooked.

- Files ending with `_row.m` refer to a version of the model which posits an exogenous demand for rest-of-world assets. These results are only used in the steady-state calculation presented in the second panel of Table 3.

Data Availability and Provenance:

This section describes the sources of data for the regressions reported in Online Appendix C. The replication files include a copy of each spreadsheet with data described below.

1. The invoicing share data comes from Gopinath (2016) and can be downloaded from https://scholar.harvard.edu/files/gopinath/files/data_invoice_currencies.xlsx. This data is included in the spreadsheet `Invoicing Share.xlsx`.

2. The portfolio holdings data comes from the IMF's CPIS database which can be accessed at https://data.imf.org/?sk=B981B4E3-4E58-467E-9B90-9DE0C3367363&sId=1420666037900. In this replication archive we include three spreadsheets based on this database, as follows:

- `DebtAssets_CPIS.xlsx` provides a table with data on the variable "Assets, Debt Securities, BPM6, US Dollars" which represents year-end data on the total holdings of foreign debt securities by country and year of observation. We have downloaded data for the same list of countries as the ones in the Gopinath (2016) invoice share database, for the year-ends 1997-2019 (e.g. Dec 2017, Dec 2018, Dec 2019). To make sure you obtain the *total* foreign holdings of each country, in the query set "Counterpart Country" as "World". Lastly, note that the CPIS database itself has a gap between 1998-2000, hence the first two time observations are Dec 1997 and then Dec 2001.

- `DebtAssets_FXdenom_CPIS.xlsx` provides a table with data on the (six) variables "Assets, Debt Securities, Denominated in X currency, BPM6, US Dollars" where X ∈ {USD, British Pound, Euros, Japanese Yen, Swiss Francs, and Other currencies}, which are data on the total holdings of foreign debt securities by country and year of observation, broken down by the currency denomination of those debt assets.

- `USDebtAssets_CPIS.xlsx` is a spreadsheet with data on holdings of US Debt securities by foreign countries – we obtain this by selecting "Assets, Debt Securities, BPM6, US Dollars" and "Counterpart Country" as the "United States".

3. GDP data is from the World bank World Development Indicators database which can be accessed at https://databank.worldbank.org/source/world-development-indicators. The variable we use is "GDP (current US$)", series code "NY.GDP.MKTP.CD". This data is included in the spreadsheet `GDP_worldbank.xlsx`.

4. The data on total Imports and Exports by country is from the IMF's database on Direction of Trade Statistics (DOTS), which can be accessed at https://data.imf.org/?sk=9D6028D4-F14A-464C-A2F2-59B2CD424B85. The variables we use are "Goods, Value of Exports, Free on Board (FOB), US Dollars" and "Goods, Value of Imports, Free on Board (FOB), US Dollars", in both cases the "Counterpart Country" is "World". This data is included in the spreadsheets `Exports_IMF.xlsx` and `Imports_IMF.xlsx`.

5. The data for US exports and imports from a particular country is from the US Census Bureau database, which can be accessed after making a free account at https://usatrade.census.gov/index.php?do=login. Once logged-in, select "Harmonized System (HS) District-level Data", and then for both Exports and Imports, make the following selections

- Measures: Value($US)
- Commodity: All Commodities
- Country: Select the country list to match the one `Invoicing Share.xlsx`.
- Domestic/Foreign: Total Exports
- District: All Districts
- Time: 1999-2019

A copy of the US exports and imports dataset we use is included in the spreadsheets `USExports_Census.xlsx` and `USImports_Census.xlsx`.

6. The data on bank liabilities to non-bank entities is the same one as used in Gopinath and Stein (2020), and can be downloaded from the *QJE* dataverse replication site here: https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/CI13SP. Download the file called `Data2_liability_allinstruments_currencies.csv`. In our replication files we attach a spreadsheet called `BIS_locbank_GS.xlsx` which contains this data (with country rows re-ordered to conform with the ordering in the invoice data spreadsheet described above).

To reproduce the tables reported in Online Appendix C call `>>appendix_tables.m` from the root directory. These empirical results are also reproduced as part of the replication of the whole paper which is done by `run_all.m`

Dataset List:

Data file / Folder	Source	Notes	Provided?
Invoicing Share.xlsx	Gopinath (2016)	USD Invoicing data	Yes
DebtAssets_CPIS.xlsx	IMF	Foreign debt holdings	Yes
DebtAssets_FXdenom_CPIS.xlsx	IMF	Foreign debt assets by currency comp.	Yes
USDebtAssets_CPIS.xlsx	IMF	US-issues foreign debt assets	Yes
GDP_worldbank.xlsx	World Bank	Nominal GDP (in US$)	Yes
Exports_IMF.xlsx	IMF DOTS	Total Exports (in US$)	Yes
Imports_IMF.xlsx	IMF DOTS	Total Imports (in US$)	Yes
USExports_Census.xlsx	US Census Bureau	US Exports, by country (in US$)	Yes
USImports_Census.xlsx	US Census Bureau	US Imports, by country (in US$)	Yes
BIS_locbank_GS.xlsx	Gopinath and Stein (2020)	US$ bank liabilities, by country	Yes

References

Gopinath, G. (2016). The International Price System. In *Jackson Hole Symposium Proceedings*.

Gopinath, G. and J. C. Stein (2020). Banking, Trade, and the Making of a Dominant Currency. *The Quarterly Journal of Economics 136*(2), 783–830.