

Empirical Exercise 9: Estimating the effects of WTO accession

October 21, 2021

Instructor: Marc-Andreas Muendler muendler@ucsd.edu
 Teaching Assistant: Jacob Orchard jdorchard@ucsd.edu

Due date and time: October 29, 5pm

Inputs and products

Please use Stata (any version) for your work. You may call any other software from within Stata (including Python, R, Perl, and system-level commands). Please base your analysis on the following files

ITPD-E by USITC `itpd.dta`
 Gravity data by CEPII `cepii-gravdata.dta`

in the online data folder at <https://econweb.ucsd.edu/muendler/teach/21f/435/gen>.

You may find the code accompanying the textbook Yotov et al. (2016) a useful reference, see <https://vi.unctad.org/tpa/web/zips/vol2/Advanced%20Guide%20to%20TPA.zip>. This exercise is a replication of Exercise 1.1 (*Estimating the effects of WTO accession*) in Yotov et al. (2016, p. 55) for the ITPD-E data and the years 2000, 2005, 2010, 2015. For data preparation, you may find the code from lecture 7 a useful reference: `lec07.do` in the online lecture folder <https://econweb.ucsd.edu/muendler/teach/21f/435/lec07>.

Please submit three products to canvas.ucsd.edu by the due time: (i) a file with results titled *ee09.pdf*, (ii) a log file titled *ee09.log*, and (iii) a Stata code file titled *ee09.do* (which may call other software). **Your log file must exhaustively document the steps from the above input files to the output of results.**

Tasks

1. Preliminaries (data construction to match Exercise 1.1 *Estimating the effects of WTO accession* in Yotov et al. (2016, p. 55)).
 - (a) Use the gravity data by CEPII at the source country (origin), destination country, and year level, keep all years, and extract the following variables: population-weighted distance in kilometers (to match the Yotov et al. (2016, p. 55) data), contiguity (shared border), common official language, shared colonial relationship (ever in colonial relationship), the FTA indicator by the WTO, an indicator whether the source country is a WTO member (see the code `lec07.do` for corrections of discrepancies in the GATT/WTO membership indicators), and an indicator whether the destination country is a WTO member.
 - (b) Correct the WTO indicator in the CEPII data by year so that it is set to one if, in the given year, the WTO indicator is one for any partner country.
Hint: For source countries, for example, use the Stata command `egen wto_src = max(gatt_o), by(src year)` and compare the new variable `wto_src` to the existing one `gatt_o`. What do you find?
 - (c) Construct one single data file for trade in goods and services. Use the ITPD-E data by USITC, do not remove self trade, keep the four years 2000, 2005, 2010 and 2015, and aggregate the trade flows to the source country (exporter), destination country (importer), and year level (over all industries).

- (d) Combine (merge) the single ITPD-E trade data for goods and services with the CEPII gravity data at the source country, destination country, and year level. (Make sure your log file reports the merge results; drop all unmatched years.)
- (e) Generate a bilateral WTO indicator that takes the value of one if both the source and destination are in the WTO and the source country acceded to the WTO in a year weakly after the destination (replicating the data for Exercise 1.1 in Yotov et al. (2016, p. 55)).
Hint: Consider the commands `gen byte wto_both = (wto_src==1 & wto_dst==1 & gattyr_src >= gattyr_dst)` and `replace wto_both = 0 if sorc_iso3 == dest_iso3`, where `gattyr_src` stands for the year of accession of the source country and `gattyr_dst` for the year of accession of the destination.

2. Graph (replicating Exercise 1.1 in Yotov et al. (2016, p. 55)).

- After step 1.1 above, create a histogram reporting the frequency of the number of the member countries of the WTO by year of accession.
Hint: Consider the command `histogram gattyr, discrete frequency addlabels`, where `gattyr` stands for year of accession.

3. Regressions.

- (a) Similar to Lecture 7 (but replicating Exercise 1.1 in Yotov et al. (2016, p. 55)), run four specifications of the gravity equation.
- Estimate a standard gravity specification with OLS, excluding observations with self trade, using as regressors the indicator for contiguity, the indicator for common official language, the indicator for a shared colonial relationship, the FTA indicator by the WTO, and the bilateral WTO indicator constructed in 1.2 above. Condition on source-year and destination-year fixed effects. Cluster the standard errors at the level of source-destination pairs.
Hint: You may find the command `reghdfe` useful (with the option `nocons` for OLS regressions with pairwise clustering). If you use the do file by Yotov et al. (2016, p. 55), note that the dependent variable must be in logs for OLS (correct the mistake).
 - Re-estimate the same specification but expressed in multiplicative form with the PPML estimator. Make sure your sample includes zero trade flows.
Hint: Consider using the command `ppmlhdfe`.
 - Re-estimate the previous specification with the PPML estimator but this time by considering international and intra-national trade (not removing observations with self trade). Condition on source-year, destination-year and source-destination pair fixed effects. Cluster the standard errors at the level of source-destination pairs.
 - Generate international border indicators for the years 2000, 2005, 2010 and 2015. Then re-estimate the previous specification with the PPML estimator (not removing observations with self trade) and including as additional regressors the international border indicators for three of the four years 2000, 2005, 2010 and 2015.
Hint: To generate international border indicators by year, you may find it useful to consider commands like `gen byte intlbrdr = (sorc_iso3 = dest_iso3)` and `gen byte intlbrdr_`year' = intlbrdr if year == `year'`.

4. Interpretation.

- Consider the sign on the WTO accession variable in the final regression. In one sentence, provide an explanation for your finding in 2000-2015.

References

Yotov, Yoto V., Roberta Piermartini, José-Antonio Monteiro, and Mario Larch. 2016. *An Advanced Guide to Trade Policy Analysis: The Structural Gravity Model*. Geneva: World Trade Organization.