GPEC 435 — Fall 2021

Topics in International Trade

Empirical Exercise 10: The dynamics of comparative advantage

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Due date and time: **November 5, 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 file

ITPD-E by USITC	`itpd.dta`
Ready code	`ee10-dataprep.do`

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

You may find the ready data preparation code `ee10-dataprep.do` a useful reference in the online lecture folder. If you wish to proceed with data preparation on your own, you may find the code from lectures 11 and 4 useful references: `lec11.do` in the online lecture folder `https://econweb.ucsd.edu/muendler/teach/21f/435/lec11`, showing the sample reduction to 68 countries and a rest-of-the-world economy, and `lec04.do` in the online lecture folder `https://econweb.ucsd.edu/muendler/teach/21f/435/lec04`, showing the construction of numeric source and destination IDs.

Please submit three products to `canvas.ucsd.edu` by the due time: (i) a file with results titled *ee10.pdf*, (ii) a log file titled *ee10.log*, and (iii) a Stata code file titled *ee10.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.

   (a) Construct one single data file for trade in goods and services at the *industry* level. Use the ITPD-E data by USITC, do not remove self trade, keep all years 2000 through 2015, and all industries as well as the variable for broad sectors. Identify the 68 top-exporting source countries over all years and reduce the ITPD data to the 68 top-exporting source countries plus a newly defined country ROW (rest of the world); for sample code see lecture 11. Create numeric ID variables for source and destination countries to succinctly estimate fixed effects; for sample code see lecture 4.
   Hint: You may use ready data preparation code from *ee10-dataprep.do* in the online lecture folder `https://econweb.ucsd.edu/muendler/teach/21f/435/gen` to complete this step.

   (b) Compute for each source country s's industry i at time t its revealed comparative advantage

   $$RCA_{sit} \equiv \frac{EX_{sit}/EX_{s\cdot t}}{EX_{\cdot it}/EX_{\cdot\cdot t}}$$

   according to Balassa (1965), where EX_{sit} are exports. For all feasible years (2010 through 2015), compute the decadal change in log RCA ($\ln RCA_{si,t+10} - \ln RCA_{si,t}$).
   Hint: You may re-use your earlier code for the construction of log RCA and its decadal change in Empirical Exercise 2.

2. Gravity-based absolute advantage measures.

   (a) To construct a measure of absolute advantage (similar to the numerator in the Balassa measure), but free of geographic confounders, linearly estimate log gravity and then extract the source-industry-year effects.

      i. Concretely, estimate a standard log gravity specification with OLS, including observations with self trade, using only fixed effects and their combinations to remove possibly many geographic determinants of trade: condition on source-industry-year, destination-industry-year, source–destination-industry and source-destination-year fixed effects.
      Hint: You may find the command `reghdfe` useful—with no bilateral variables but the option `absorb(..., savefe)` for all source-industry-year, destination-industry-year, source-destination-industry and source-destination-year fixed effects. The regression may require long runtime.

      ii. Immediately after completion of the regression, generate an indicator variable `_insmpl` that records whether an observation is in the log gravity regression sample and save the output (in a file such as *itpd-indlvl-2000-2015-sample.dta*. (You do not want to repeat the regression and instead work on the remaining data preparations.)

      iii. Extract absolute advantage as the exponentiated source-industry-year fixed effect from the log gravity regression, and make the United States in the year 2015 and an industry of your choice the reference category for the destination-industry-year effects.
      Hint: You may find the following code useful:

```
qui summ ind if _insmpl
local minind = `r(min)'
tab ind if ind==`minind' // reference industry
qui summ __hdfe2__ if dest_iso3=="USA" & year==2015 & ind==`minind'
local dst_fe_usa15minind = `r(mean)'
gen double exp_srcfe = exp( __hdfe1__ + `dst_fe_usa15minind' ///
                                                    + _b[\_cons] )
```

      iv. Compute gravity-based log absolute advantage $\ln A_{sit}$ as the log of the exponentiated source-industry-year fixed effect, and compute the decadal change in gravity-based log absolute advantage ($\ln A_{si,t+10} - \ln A_{si,t}$).

3. Regressions.

   (a) Similar to Empirical Exercise 2, but for more years, run an ordinary least squares regression to project the decadal change in $\ln A_{si,t+10} - \ln A_{si,t}$ on the level of $\ln A_{si,t}$ for gravity-based absolute advantage, and again for the related Balassa comparative-advantage measures ($\ln RCA_{si,t+10} - \ln RCA_{si,t}$ projected on $\ln RCA_{si,t}$). Restrict the broad sector to manufacturing only. Condition on source-year and industry-year fixed effects in each regression.

   (b) Run one more pair of comparable regressions: Restrict the broad sector to services only.

4. Interpretation.

   - In two sentences, compare your finding between measures of advantage and between the manufacturing and services sectors.
   Hint: Conditioning on source-year and industry-year fixed effects in the regressions under (3) allows you to interpret the coefficient estimates as related to *comparative advantage*.

References

Balassa, Bela. 1965. "Trade Liberalization and Revealed Comparative Advantage." *Manchester School of Economic and Social Studies*, 33: 99–123.