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Session 11 Ex-post FTA-impact analysis

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Outline

- Gravity models for FTA impact assessment
- Trade-creation and trade diversion in gravity models
- Dealing with econometric issues

Gravity models for FTA impact assessment

- The standard theoretical gravity specification includes *exporter-time* and *importer-time* fixed effects, and considers only international trade flows (i.e. for $i \neq j$).
- The basic FTA-gravity model include an FTA dummy
 $RTA_{ijt} = 1$ if country i and j are in the same FTA at time t , and 0 otherwise.

OLS:

$$\ln X_{ij,t} = \pi_{i,t} + \chi_{j,t} + \beta_1 \ln DIST_{ij} + \beta_2 CNTG_{ij} + \beta_3 LANG_{ij} + \beta_4 CLNY_{ij} + \beta_5 RTA_{ij,t} + \varepsilon_{ij,t}$$

PPML:

$$\ln X_{ij,t} = \exp \left[\pi_{i,t} + \chi_{j,t} + \beta_1 \ln DIST_{ij} + \beta_2 CNTG_{ij} + \beta_3 LANG_{ij} + \beta_4 CLNY_{ij} + \beta_5 RTA_{ij,t} \right] \times \varepsilon_{ij,t}$$

Trade-creation and trade diversion

- Suppose that countries i and j belong to a common FTA, whereas country k does not.
- If, after the FTA's formation, i imports more from j and less from k , trade diversion is likely.
- If, in contrast, country i imports more from j and k , trade creation is likely.

Ex. whether MERCOSUR is trade diverting or trade creating?

- Two dummy variables:
 - *BothinM* = 1 if i and j are both members of MERCOSUR at time t and 0 otherwise
 - *OneinM* = 1 if the importer (i) belongs to MERCOSUR but the exporter (j) does not.

$$\ln X_{ijt} = \beta_0 + \beta_1 i + \beta_2 j + \beta_3 \ln(\text{dist}_{ij}) + \beta_4 \text{cont}_{ij} + \beta_5 \text{lang}_{ij} + \beta_6 \text{ccol}_{ij} + \beta_7 \text{col}_{ij} + \beta_8 \text{landlock}_{ij} + \beta_9 \text{OneinM}_{ijt} + \beta_{10} \text{BothinM}_{ijt} + \varepsilon_{ijt} \quad (3.8)$$

Assuming all RTA coefficients are significant:

$\beta_9 > 0$ and $\beta_{10} > 0$ implies trade creation.

$\beta_9 > 0$ and $\beta_{10} < 0$ suggests trade diversion.

Limitations

- FTAs are likely to have reverse causality with trade.
- FTAs may have non-linear and phasing-in effects over time.
- Trade diversion from domestic sales does not capture in the model without domestic trade data
- FTA may be created to serve non-trade goals.

DEALING WITH ECONOMETRIC ISSUES

Addressing potential endogeneity of RTAs

- Following Baier and Bergstrand (2007), the gravity specification is modified to include pair fixed effects (μ_{ij}) in addition to the theoretically-motivated *importer-time* and *exporter-time* fixed effects:

$$X_{ij,t} = \exp \left[\pi_{i,t} + \chi_{j,t} + \mu_{ij} + \beta_5 RTA_{ij,t} \right] \times \varepsilon_{ij,t}$$

Testing for potential “reverse causality” between trade and RTAs

- Adding a new variable capturing the future level of RTAs to specification
- If RTAs are exogenous to trade flows, the parameter β_6 associated with the coefficient of a future RTA should be statistically not different from zero. (Wooldridge, 2010; Baier and Bergstrand, 2007)

$$X_{ij,t} = \exp \left[\pi_{i,t} + \chi_{j,t} + \mu_{ij} + \beta_5 RTA_{ij,t} + \beta_6 RTA_{ij,t+4} \right] \times \varepsilon_{ij,t}$$

Allowing for potential non-linear and phasing-in effects of RTAs

- In order to allow for non-linear effects of RTAs and/or to capture the possibility that the effects of RTAs change over time, specification is further modified to include various lags (up to 12 years) of the variable *RTA*:

$$X_{ij,t} = \exp \left[\pi_{i,t} + \chi_{j,t} + \mu_{ij} + \beta_5 RTA_{ij,t} + \beta_6 RTA_{ij,t-4} + \beta_7 RTA_{ij,t-8} + \beta_8 RTA_{ij,t-12} \right] \times \varepsilon_{ij,t}$$

Allowing for trade-diversion from domestic sales

- Following Dai et al. (2014) and Anderson and Yotov (2016), the gravity specification is re-estimated by expanding the sample to include *intra-national* trade flows data in addition to
- *international* trade flows. The idea is that RTAs may be diverting trade from domestic to international sales and, therefore, the estimates of the variable *RTA* that are based on *international* trade only may be biased downward.

EMPIRICAL EXERCISES

Exercise 5

Use data from "agGravityData.dta" and estimate the gravity model to quantify trade creation and diversion of NAFTA

1. Create NAFTA dummies since 1994:

nafta =1 if home (ccode) is NAFTA a member

pnafta = 1 if partner (pcode) is nafta member

intra_nafta=1 if trade bewteen NAFTA members

imp_nafta_rest =1 if nafta's imports from the rest of the world

2. Estimate the gravity models and comments on impacts of NAFTA in terms of trade creation and trade diversion

3. Estimate the gravity models and comment on the evolution of trade creation and diversion

4. Is there export diversion?

Hint: create non-NAFTA export dummy:

exp_nafta_rest =1 if nafta's exports to the rest of the world

Bonus: Find the way to comment on the evolution of export diversion