

The Political Economy of PTAs: An Empirical Investigation

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Motivation

- theory suggests CUs welfare dominate FTAs
- yet many PTAs take the form of FTAs
- propose/extend model that can explain this
- empirically test determinants suggested by the model
- the determinants of forming an agreement
- as well as the determinants of its type (FTA vs CU)

Outline

- preview of results
- related literature
- model setup and solution
- predictions of the model
- empirical analysis
- conclusion

Preview of main results

- If income inequality in prospective member countries is high, and trade imbalances between them are significant, no PTA will be formed in political equilibrium.
- If a PTA is formed, geographical specialization of production favors a FTA, while uniform production structures lead to a CU.

Literature

- Ornelas (2007), Saggi (2006): Customs Unions raise welfare compared to FTA
- Grossman and Helpman (1995), Krishna (1998): Welfare reducing FTA are politically viable in the presence of pressure groups
- Ornelas (2005): With endogenous tariffs the formation of welfare reducing FTA is likely to be undermined
- Facchini, Silva, Willmann (2013): FTA politically feasible instead of CU due to strategic delegation.
- Baier and Bergstrand (2004): Empirical determinants of FTA formation.
- Larch and Egger (2008): Incorporate domino effect of PTA formation.

The model: Setup

- three countries: A and B are the prospective members; country F represents the rest of the world.
- $n + 1$ goods are produced:
 - numeraire good 0 is produced by all countries using only labor according to an identity production function, and is freely traded
 - goods 1 thru ϕn are produced by duopolies with one firm in F, and $\alpha \geq 0.5$ of the other firm located in A, and $(1 - \alpha)$ in B.
 - goods $\phi n + 1$ thru n are produced by duopolies with one firm in F, and share α $(1 - \alpha)$ of the other firm in B (A).
 - cross-border ownership: share β of a firm owned by locals (and $(1 - \beta)$ by stakeholders in the other member country)
 - marginal costs are constant; oligopolists compete on quantity (Cournot).

The model: Setup

- Mass one of individuals in each prospective member country.
- Individuals supply one unit of labor, but differ in their ownership share of duopolists. Let $\gamma_{s,l}$ be the fraction of the duopolists' profits received by individual l in country s .
- We assume wlog $\bar{\gamma} = 1$, typical wealth distributions imply $\gamma^m \leq 1$, where m denotes the median of the distribution.
- Each individual has quasi-linear preferences

$$u(x) = x^0 + \sum_{i=1}^{n\phi} (Hx^i - 0.5(x^i)^2) + \sum_{j=n\phi+1}^n (Hx^j - 0.5(x^j)^2)$$

- Note that markets are segmented.

The model: Setup

The indirect utility function of individual l takes the form:

$$\begin{aligned} v(\mathbf{t}, \gamma_{A,l}) &= 1 + \gamma_{A,l} \sum_{i=1}^{n\phi} \left(\alpha \beta \pi_A^i(\mathbf{t}) + (1 - \alpha)(1 - \beta) \pi_B^i(\mathbf{t}) \right) \quad (1) \\ &+ \gamma_{A,l} \sum_{j=n\phi+1}^n \left((1 - \alpha) \beta \pi_A^j(\mathbf{t}) + \alpha (1 - \beta) \pi_B^j(\mathbf{t}) \right) \\ &+ \sum_{i=1}^{n\phi} t_{F,A}^i x_{F,A}^i(\mathbf{t}_A) + \sum_{j=n\phi+1}^n t_{F,A}^j x_{F,A}^j(\mathbf{t}_A) \\ &+ \sum_{i=1}^{n\phi} (1 - \alpha) t_{B,A}^i x_{B,A}^i(\mathbf{t}_A) + \sum_{j=n\phi+1}^n \alpha t_{B,A}^j x_{B,A}^j(\mathbf{t}_A) \\ &+ \text{consumer surplus} \end{aligned}$$

Sequence of the game

The game has four stages:

- 1 Given MFN tariffs (status quo) the median voters of A and B decide whether a FTA or a CU will replace the status quo
- 2 If the status quo is abandoned, voters in A and B elect a local representative
- 3 The representatives choose the tariff level vis-a-vis the rest of the world, while free trade prevails between A and B
- 4 Firms compete in quantities, taking as given the trade policies chosen in Stage 3.

Solution procedure

- we solve the game backwards
- considering variations $\phi > 0.5$, $\alpha < 1$, and $\beta < 1$ in turn
- start with stage 4
- tariff rates are given at this stage
- country s ' firm producing good i for country d 's market solves the following maximization problem:

$$\max_{x_{s,d}^i} \left[p_d^i - c - t_{s,d}^i \right] x_{s,d}^i$$

- standard Cournot problem

Stage 4

- using the fact that demand is linear, and focusing on market A, we obtain the following equilibrium quantities and prices:

$$x_{A,A}^i = \frac{(H + (1 - \alpha)t_{B,A}^i + t_{F,A}^i - c)}{3}$$
$$x_{F,A}^i = \frac{(H + (1 - \alpha)t_{B,A}^i - 2t_{F,A}^i - c)}{3}$$
$$x_{B,A}^i = \frac{(H - (2 + \alpha)t_{B,A}^i + t_{F,A}^i - c)}{3}$$
$$p_A^i = \frac{(H + (1 - \alpha)t_{B,A}^i + t_{F,A}^i + 2c)}{3}$$

- similar expressions for goods j and markets B and F

Third and Second stage

- Determine the identity of each representative, and the tariff choice under three policy regimes:
 - 1 Status quo policy: Most Favorite Nation tariffs
 - 2 Free Trade Area: non-cooperative preferential agreement
 - 3 Customs Union: cooperative preferential agreement
- different constraints on tariffs under each regime
 - 1 uniform external tariffs under MFN
 - 2 no tariffs between A and B under FTA
 - 3 dito plus CET under CU

Third and Second stage, cont'd

Important results:

- standard tariff complementarity for MFN vs FTA
- tariffs under FTA lower than under MFN
- cooperative tariff setting only under CU
- strategic delegation only for CU
- more protectionist representatives under CU
- and thus higher tariffs for CU

First stage

- median voter decides on policy regime
- status quo (MFN) vs PTA
- and if PTA, which type
- we'll look at solution graphically
- considering variations $\phi > 0.5$, $\alpha < 1$, and $\beta < 1$ in turn

Trade imbalance: surplus country A

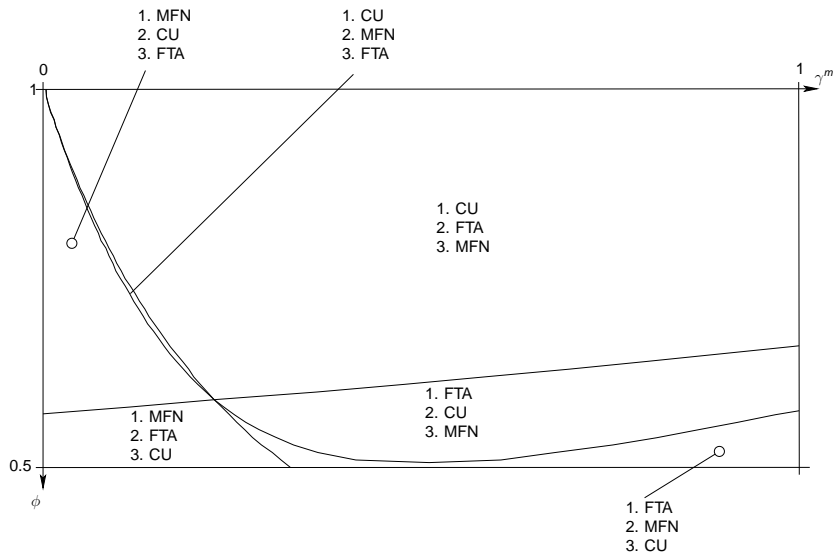


Figure: The median voter's ranking

Trade imbalance: deficit country B

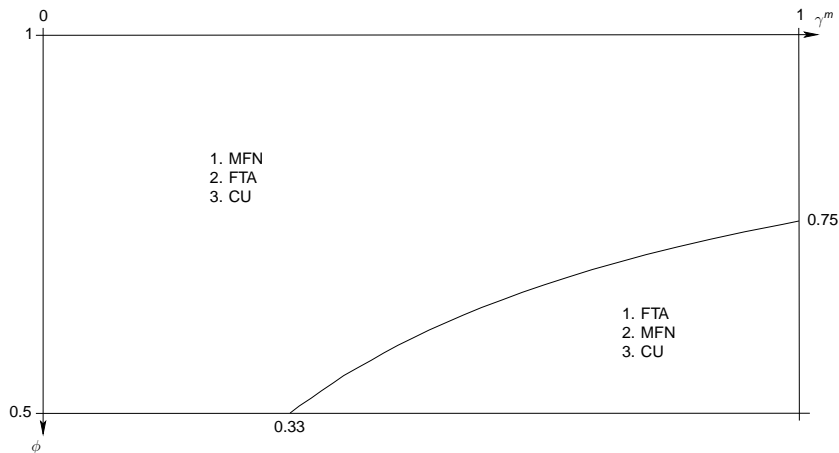


Figure: The median voter's ranking

Trade imbalance

Insights:

- deficit country is the 'constraint'
- PTA only if trade imbalance not too large
- and if inequality is not too high

Geographical specialization

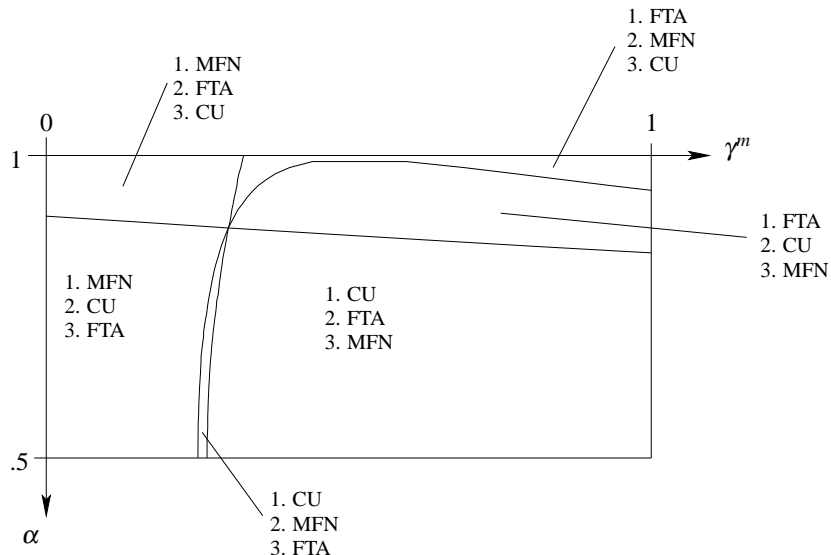


Figure 1: The Median's Rankings

Geographical specialization

Insights:

- PTA only if inequality not too high
- if production structures geographically specialized: FTA
- for more uniform production structures across space: CU
- results similar for cross-border ownership

Theoretical results

quick summary of results; that is, hypotheses to be tested empirically

- If income inequality in prospective member countries is high, and trade imbalances between them are significant, no PTA will be formed in political equilibrium.
- If a PTA is formed, geographical specialization of production favors a FTA, while uniform production structures lead to a CU.

Data

- dyadic country-pair panel dataset
- comprising 124 countries
- time period 1950–2000
- in five year steps
- PTA classification based on Mattevi (2005)
- own variables: IMB, INEQ, GEO
- plus standard variables as controls

Data

PTA classification:

- de jure: FTA, CU, partial
- PTA dummy, FTA dummy for type
- discard partial

Main variables:

- IMB_{abt} : IMF's direction of trade database
- $INEQ_{abt}$: max net Gini taken from Solt's Standardized World Income Inequality Database
- $GEO_{abt} = |SER_{at} - SER_{bt}| + |IND_{at} - IND_{bt}| + |AGR_{at} - AGR_{bt}|$

Standard variables:

- $NATURAL$, $DCONT$, $REMOTE$, $GDPSUM$, $GDPSIM$
- DKL , $SDKL$, $DROWKL$

Data

Main Variables	(1) All Sample	(2) PTA	(3) FTA	(4) CU
Geographic specialization (GEO)	42.11 (25.19)	26.33 (19.48)	30.89 (19.95)	21.55 (17.79)
Inequality (INEQ)	40.93 (10.26)	34.22 (8.04)	32.32 (7.38)	36.20 (8.22)
Trade-Imbalance (IMB)	0.66 (0.34)	0.33 (0.29)	0.37 (0.28)	0.31 (0.29)
Total number of observations	30906	773	395	378
Number of EU country pairs	248	248	0	248

Empirical strategy

- probit model with selection
- as in Van de Ven and Van Pragg (1981)
- $PTA_{abt} = \alpha_0 + \alpha_1 INEQ_{ab,t-5} + \alpha_2 IMB_{ab,t-5} + \beta X_{ab,t-5} + \epsilon_{abt}$
- expected signs: $\alpha_1 < 0$ and $\alpha_2 < 0$
- $FTA_{abt} = \theta_0 + \theta_1 GEO_{ab,t-5} + \theta_2 (GEO \times INEQ)_{ab,t-5} + v_t$
- expected signs: $\theta_1 > 0$ and $\theta_2 < 0$
- year fixed effects and averages of RHS variables

Empirical results

	Predicted Sign	(1)	(2)	Marginal Effects
CU-FTA decision (latent)				
GEO	+	0.05** (0.01)	0.06** (0.01)	0.001** (0.0005)
GEO*INEQ	-	-0.001** (0.0002)	-0.002** (0.0002)	
PTA decision (selection)				
INEQ	-	-0.017** (0.006)	-0.028** (0.006)	-0.001** (0.0002)
IMB	-	-0.127 (0.101)	-0.111 (0.101)	-0.004 (-0.004)

Matrix X Elements

Number of Obs.	30906	30906	30906
Number of Obs. with FTA-CUs	773	773	773
LR test of indep. eqns.	136.97**	153.51**	153.51**
Year Fixed Effects	No	Yes	Yes

Empirical Results

	Predicted Sign	(1)	(2)	Marginal Effects
Matrix X Elements				
Natural	+	0.694** (0.035)	0.703** (0.035)	0.025** (0.001)
DCONT	+	0.204** (0.06)	0.193** (0.057)	0.007** (0.002)
REMOTE	+	0.843** (0.199)	0.871** (0.21)	0.032** (0.007)
GDPSUM	+	1.092** (0.091)	0.599** (0.114)	0.022** (0.004)
GDPSIM	+	0.302** (0.133)	0.107 (0.135)	0.004 (0.004)
DKL	+	0.402** (0.198)	0.347* (0.196)	0.012* (0.007)
SDKL	-	-0.323** (0.087)	-0.319** (0.084)	-0.012** (0.003)
DROWKL	-	0.929** (0.181)	0.883** (0.182)	0.032** (0.007)

Economic Relevance

- consider marginal effects for GEO and INEQ
- if former increases by one standard deviation
- likelihood of FTA vs CU increases by 1.94%
- if later increases by one standard deviation
- likelihood of PTA increases by 2.5%

Robustness checks

- include (significant) standard variables in CU-FTA eqtn
- include additionally cross-border ownership
- include INEQ and IMB in PTA eqtn
- see table 3 in paper
- 10 yr instead of 5 yr lags
- cross-section only
- PTA specification of Baier, Bergstrand and Feng (2013)
- use controls of Egger and Larch (2008)
- see table 4 in paper

Conclusion

- extend political economy model of PTA formation
- suggest novel determinants of PTA formation
- and for the choice of PTA type
- test predictions empirically
- evidence for the role of inequality and trade imbalances in PTA formation
- and for the role of geographical specialization and cross-border ownership in the choice of FTA vs CU