

Explaining Investment Rules in Trade Agreements

A Bayesian Spatial Probit Approach

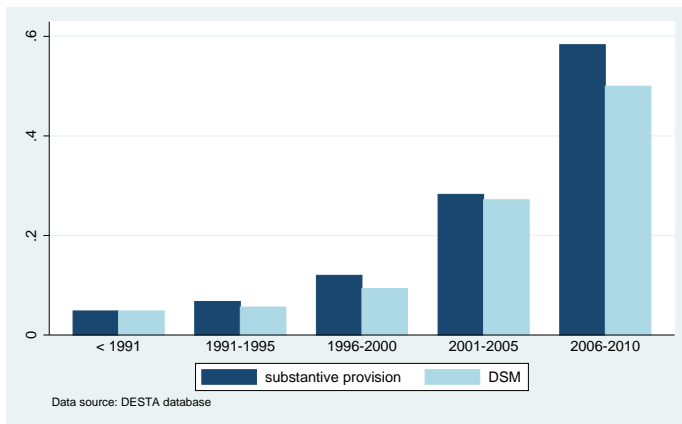
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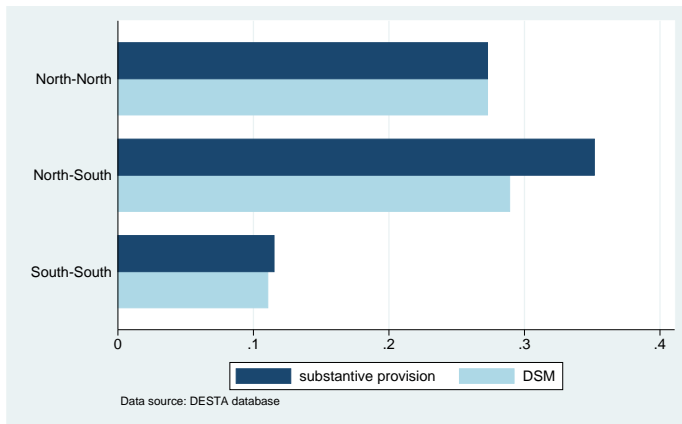
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Including investment rules in trade agreements has become **more common** over time ...



...but also **more controversial!**

- higher trade and investment flows?
- less policy space?



- Gravity variables predict relatively well which countries form a PTA and BIT (e.g. Baier and Bergstrand, 2004; Bergstrand and Egger, 2013).
- PTAs are very heterogeneous (Horn, Mavroidis and Sapir, 2010; Kohl, Brakman and Garretsen, 2013; Dür, Baccini and Elsig, 2014).
- PTAs are deeper for North-South pairs and countries involved in production network trade (Damuri, 2012; Orefice and Rocha, 2013).
- “Contagion effects” / “competitive diffusion” (Egger and Larch, 2008; Baldwin and Jaimovich, 2012; Baccini, Dür and Elsig, 2012; Baccini and Dür, 2012; Baccini and Dür, 2013; Neumayer, Nunnenkamp and Roy, 2014; Baccini, Dür and Haftel, 2014)

→ no study looking specifically at the determinants of investment rules in trade agreements

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Globalisation

...with GVCs, trade and investment matters are closely intertwined;

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Evolution

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Identification

...they always do so (model treaty);

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...they always do so (model treaty);

Imitation

...other countries do it, too (spatial interdependence).

- **investment provisions:** dummy indicator on the inclusion of (i) a substantive investment provision and (ii) a dispute-settlement mechanism in the FTA (1990-2010), kindly provided by DESTA team (Dür et al., 2014)
- **GVC trade:** indicator on GVC participation, kindly provided by UNCTAD based on EORA-MRIO database (Lenzen et al., 2012, 2013); inward and outward stock of FDI (WDI)
- **regulatory variation:** indicators on legal frameworks, property rights protection, political regimes etc. (QoG dataset Teorell et al., 2013)
- **others:** gravity variables (CEPII); real GDP, GDPpc (WDI); BITs (UNCTAD)...

Explanatory variables are lagged 5 years to reduce simultaneity bias.

The variable of interest is

$$y = \begin{cases} 1 & \text{a substantive investment provision/DSM is included;} \\ 0 & \text{no substantive investment provision/DSM is included.} \end{cases} \quad (1)$$

The underlying latent variable follows a **spatial autoregressive process**

$$y_{ij}^* = \rho W y_{ij}^* + X_{ij} \beta + \epsilon_{ij}, \quad (2)$$

where W is a row-normalised spatial weighting matrix of dimension $n \times n$ which captures the degree of interdependence between observations. When rearranging terms,

$$(I - \rho W) y^* = X \beta + \epsilon \quad (3)$$

$$y^* = (I - \rho W)^{-1} X \beta + (I - \rho W)^{-1} \epsilon \quad (4)$$

it becomes evident that errors are non-spherical/ obs not independent.

→ Remedy: **Bayesian MCMC simulation**

Bayesian MCMC simulation: How does that work?

Challenge:

joint posterior distribution of the parameters $f(y^*, \beta, \rho|y)$ unknown

Solution:

Metropolis Hastings-within-Gibbs sampling

Gibbs sampling: sampling through the (known) conditional densities $f(y^*|\beta, \rho, y)$, $f(\beta|y^*, \rho, y)$ and $f(\rho|\beta, y^*, y)$ to approximate the the joint posterior density

Metropolis-Hastings sampling: approximating the distribution of ρ since it is not well-behaved and cannot be sampled from directly

(cf. Franzese et al., 2010; Wilhelm and de Matos, 2013)

Globalisation

Spatial probit estimation based on Bayesian MCMC simulations

VARIABLES	(1) INV contiguity	(2) INV distance	(3) INV trade	(4) DSM contiguity	(5) DSM distance	(6) DSM trade
FDIsum	0.0010*** (0.0002)	0.0018*** (0.0003)	0.0020*** (0.0003)	0.0012*** (0.0002)	0.0015*** (0.0002)	0.0017*** (0.0003)
GVCsum	-0.4393** (0.2045)	0.1598 (0.2019)	0.2859 (0.1992)	-0.2067 (0.2412)	0.1793 (0.2358)	0.2998 (0.2455)
Gravity variables	yes	yes	yes	yes	yes	yes
Institutional variables	yes	yes	yes	yes	yes	yes
Period indicators	yes	yes	yes	yes	yes	yes
Spatial lag	yes	yes	yes	yes	yes	yes
Constant	yes	yes	yes	yes	yes	yes
Obs	1572	1572	1572	1572	1572	1572
Draws	11000	11000	11000	11000	11000	11000
Burn-In	1000	1000	1000	1000	1000	1000
AIC	1233.267	1200.881	1195.345	669.5957	778.1298	796.695

Standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Regulatory variation

Spatial probit estimation based on Bayesian MCMC simulations

VARIABLES	(1) INV contiguity	(2) INV distance	(3) INV trade	(4) DSM contiguity	(5) DSM distance	(6) DSM trade
GDPdiff	-0.0731 (0.0472)	-0.1190*** (0.0422)	-0.1193*** (0.0412)	-0.0284 (0.0544)	-0.0421 (0.0505)	-0.0600 (0.0500)
DEMOCdiff	-0.0624*** (0.0089)	-0.0785*** (0.0096)	-0.0814*** (0.0098)	-0.1314*** (0.0135)	-0.117*** (0.0139)	-0.1331*** (0.0142)
LEGPROPdiff	0.0187 (0.0411)	-0.0051 (0.0400)	(0.0399)	-0.0025 (0.0457)	-0.0832* (0.0452)	-0.0864* (0.0450)
CHECKSsum	0.0376** (0.0178)	0.1296*** (0.0161)	0.1428*** (0.0155)	0.0295 (0.0195)	0.0888*** (0.0179)	0.0181*** (0.0136)
Gravity variables	yes	yes	yes	yes	yes	yes
GVC variables	yes	yes	yes	yes	yes	yes
Period indicators	yes	yes	yes	yes	yes	yes
Spatial lag	yes	yes	yes	yes	yes	yes
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Obs	1572	1572	1572	1572	1572	1572
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Evolution

Spatial probit estimation based on Bayesian MCMC simulations

VARIABLES	(1) INV contiguity	(2) INV distance	(3) INV trade	(4) DSM contiguity	(5) DSM distance	(6) DSM trade
1996-2000	-0.2713* (0.1475)	-0.1315 (0.1409)	-0.0517 (0.1398)	0.0573 (0.1757)	0.0278 (0.1702)	0.1652 (0.1666)
2001-2005	-0.0853 (0.1572)	0.1085** (0.1514)	0.1761 (0.1485)	0.4407** (0.1820)	0.4779*** (0.1802)	0.6103*** (0.1782)
2006-2010	0.5668*** (0.1594)	0.5618*** (0.1515)	0.5659*** (0.1529)	0.8876*** (0.1838)	0.9049*** (0.1794)	0.9847*** (0.1798)
Gravity variables	yes	yes	yes	yes	yes	yes
GVC variables	yes	yes	yes	yes	yes	yes
Institutional variables	yes	yes	yes	yes	yes	yes
Spatial lag	yes	yes	yes	yes	yes	yes
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Identification

Spatial probit estimation based on Bayesian MCMC simulations						
VARIABLES	(1) INV contiguity	(2) INV distance	(3) INV trade	(4) DSM contiguity	(5) DSM distance	(6) DSM trade
BIT	-0.3440*** (0.1174)	-0.2878** (0.1158)	-0.2169* (0.1159)	-0.1863 (0.1250)	-0.3113** (0.1258)	-0.2141* (0.1243)
PROPENSITY	0.7739*** (0.0981)	0.7269*** (0.1197)	0.8978*** (0.1184)	0.7191*** (0.1096)	0.5248*** (0.1132)	0.8470*** (0.1174)
Gravity variables	yes	yes	yes	yes	yes	yes
GVC variables	yes	yes	yes	yes	yes	yes
Institutional variables	yes	yes	yes	yes	yes	yes
Spatial lag	yes	yes	yes	yes	yes	yes
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Imitation

Spatial probit estimation based on Bayesian MCMC simulations

VARIABLES	(1) INV contiguity	(2) INV distance	(3) INV trade	(4) DSM contiguity	(5) DSM distance	(6) DSM trade
spatial lag	0.8173***	0.2851***	0.1462*	0.6739***	0.6430***	0.6113***
Gravity variables	yes	yes	yes	yes	yes	yes
GVC variables	yes	yes	yes	yes	yes	yes
Institutional variables	yes	yes	yes	yes	yes	yes
Constant	yes	yes	yes	yes	yes	yes
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The importance of trade within GVCs (**globalisation**) can partly explain why investment rules are included in trade agreements, but. . .

. . . it also matters how trends evolve over time (**evolution**), whether countries stay true to their national policies, e.g. follow model treaties, (**identification**) and how other countries design their FTAs (**imitation**).

Spatial interdependence is important to take into account.

Differences in various institutional variables (**regulatory variation**) – despite increasing the need for common international rules – rather seem to reduce the likelihood of countries including investment rules in their FTA.

Thanks for your attention!

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