The Impacts of Trade Facilitation Measures on International Trade Flows

An application to Central America

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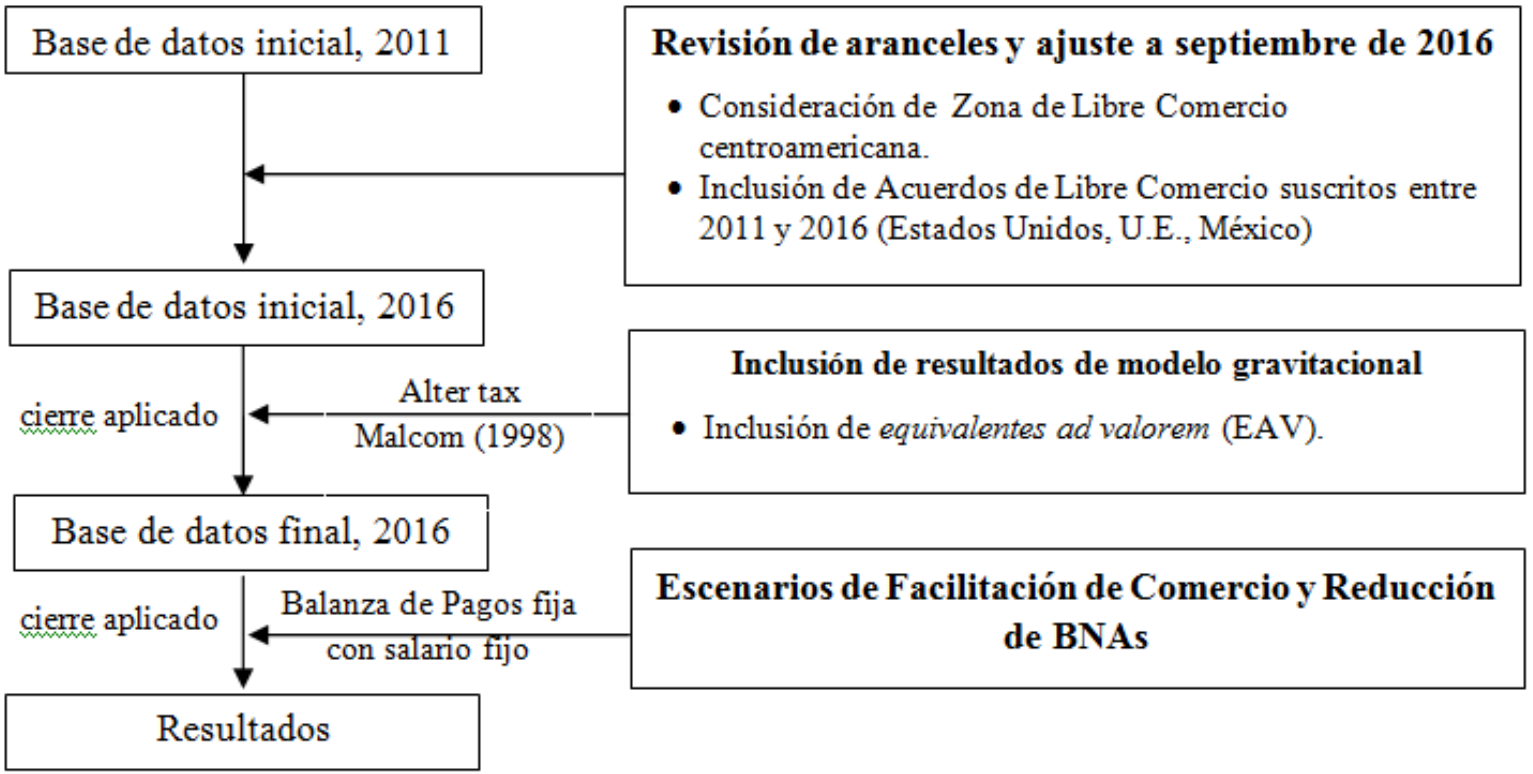
Motivation

- In the recent years, trade facilitation has become a hot topic of analysis in the context of International Trade.
  - The relative success of tariffs reduction force to look another type of frictions in trade relations.
  - The emergence of Global Value Chains significantly increases trade in intermediate goods.
- According to a recent study by the World Economic Forum 2014. A modest improvement in trade facilitation would lead to a 2.6% increase in world GDP with a 9.4% increase in world exports.

Application

Esquema 1

Procedimiento para la actualización de base de datos de GTAP a 2016 y las simulaciones de BNA



Fuente: CEPAL, elaboración propia.

Results

- In the paper, I study the impact of trade facilitation variables on bilateral trade through an augmented gravity model.
- The analysis uses a panel that includes trade data from 2004 and 2010 that includes 6 countries in Central America.
- The results show that trade facilitation variables summarized in time to produce an import or export (without transport) have a negative effect on the trade performance
- Our calculations shows that the average ad valorem equivalents tariff (AVEs) in Central America is about 30%.

Literature Review: Gravity Estimation

- We follow the seminal work of Anderson and Van Wincoop (2003) and Eaton and Kortum (2002) that build up the econometric estimation from the solution of a microeconomic model.
  1. This early models assume symmetry in the trading costs
  2. Do not take account the no relation between countries (zero values in trade)
  3. Potencial bias by the heteroscedasticity of the error term in the multiplicative form.
- To solve the first two problems a two stage estimation procedure was propose by Helpman, Melitz and Rubinstein (2008) thereafter HMR.
- And to solve the third we use a Poisson maximum likelihood estimator propose by Silva and Tenreyro (2012).

Literature Review: Trade Facilitation

- Hummels (2001) and Djankov et. al. (2008), study the effect of processing time on trade and found that the delay of one day is associated with a reduction in bilateral trade of at least one percent.
- Dennis and Pastor (2011) show that improving trade facilitation helps promote export diversification
- On the other hand Zaki (2010) evaluates the different aspects of trade facilitation in developing countries and developed through a gravitational model. He estimates ad valorem equivalent rates (EAVs) of administrative barriers to trade. His results shows that average import AVE is 27.5 % and the average for exports is 14.36 %.

Model: Gravity Setup (HMR)

$$Ln(X_{ijt}) = \beta_0 + \alpha_i * Ln(Y_{it}) + \beta_j * Ln(Y_{it}) + \lambda_j + \xi_i + \tau_t - \gamma * ln(D_{ijt}) + f(\omega_{ij}) + u_{ij}$$

- Wher X_{ijt} are the exports from i to j at time t, Y_{it} represents the GDP of the origin country i, Y_{jt} represents the GDP of the destination country j. λ_j, ξ_i are country fix effects and τ_t is the time fix effect. Finally D_{ijt} represent trade barrier variables in which trade facilitation are included.
- In addition ω_{ij} is the variable that corrects for the non-existence of trade and $f(\cdot)$ is the functional form that entry in the gravitational model. The last term u_{ij} is the stochastic error.

Model: Ad valorem equivalents tariffs (AVEs)

$$AVE^{time}_{(f,i,k)} = \frac{\gamma^{time}_{ik}}{\epsilon_{ik}}$$

- Where, $EAV^{time}_{f,i,k}$ is the cost per day associated to the trade f (import o export) from country i due to delay in the processing from k products; γ^{time}_{ik} is the time coefficient of the gravity equation and and the ϵ_{ik} is the demand elasticity of the product k in the country i.

$$AVE_{(i,j,k)} = AVE^{time}_{(x,i,k)} \cdot Days_x + AVE^{time}_{(m,j,k)} \cdot Days_m \quad (1)$$

Data

- The analysis is based on annual data, the source for trade data is the UN Comtrade. This database provides information on the value and quantity of exports at a 6-digit level of disaggregation in the harmonized system between 1998 and 2010 for about 200 countries.
- Product data is taken from the World Bank Database.
- Indicators of a continent, region, common language and Mediterranean origin come from the database that has CEPPI this is also the source of different measures of geographical distances between countries.
- The trade facilitation data are obtained from the Doing Business project web page.

Descriptive Statistics

Variable	N	Mean	Std. Dev.	Min	Max
Doc Exp.	5250	5.4	1.5	3	9
Days Exp	5250	20.5	8.5	10	38
Doc Imp.	4674	7.6	3.02	2	21
Days Imp	4674	28.9	20.5	4	117

Table: Trade facilitation average doing business database

Descriptive Statistics cont.

País	Export		Import	
	Doc	Days	Doc	Days
Costa Rica	5	19.2	5	19
El Salvador	6.8	16.1	7.6	14.8
Guatemala	7.9	17.2	5.5	19.3
Honduras	5	16.8	6.3	20.2
Nicaragua	5.1	28.1	5.2	27.5
Panama	3	10	3	9

Table: Centroamérica average doing business database

Estimation: Probability to trade

Table: Probit Centro America

Variable	Coefficient	(Std. Err.)
Distance	-0.749	(0.012)
GDP_d	0.486	(0.005)
GDP_o	0.526	(0.006)
FTA	0.745	(0.013)
Common Lenguageún	0.334	(0.052)
$Mediterranean_d$	-0.311	(0.013)
Intercept	5.025	(.104)
N	210842	
Log-likelihood	-34368.622	
$\chi^2_{(15)}$	26290.32	

Estimation: Gravity Regressions

Variables	OLS	Poisson	Panel FE	Panel RE	Poisson FE	HMR
Dist.	-0.977	-1.022		-1.036		-1.015
	(15.38)**	(34.66)**		(4.94)**		(6.15)**
Time	0.874	-1.362	-1.576	-1.113	-1.362	-1.363
	(0.96)	(88.21)**	(176.02)**	(56.32)**	(145.41)**	(5.50)**
Time	-1.214	-0.884	-1.038	-1.034	-0.575	-0.576
	(7.75)**	(20.34)**	(5.20)**	(5.19)**	(76.02)**	(6.14)**
GDP_d	0.876	0.653	0.636	0.618	0.619	0.786
	(8.93)**	(67.66)**	(4.34)**	(4.23)**	(24.49)**	(3.72)**
GDP_o	0.96	0.886	0.873	0.862	0.7568	0.551
	(32.11)**	(30.54)**	(19.21)**	(13.56)**	(84.19)**	(8.02)**

$*p \leq 0.05$;$**p \leq 0.01$

Coefficients for control dummy variables not shown

This results are similar that the results reported in Head y Mayer (2015)

Average ad valorem equivalents tariff: Partners

Import/Export	CostaRica	El Salvador	Guatemala	Honduras	Nicaragua	Panama
Costa Rica		28.5	30.5	31.2	32.9	28.1
El Salvador	26.6		26.8	27.5	29.2	24.4
Guatemala	32.7	30.8		24.3	35.2	30.5
Honduras	27.3	25.5	21.3		29.9	25.2
Nicaragua	44.2	42.4	44.4	45.1		42.1
Panama	21.8	20.0	22.0	22.8	24.4	

Table: AVE's

Gravity Regressions: Sectors

Import/Export	EEUU	UE28	Asia Pa	RM	Mexico	RestoAP	RestoALC
Costa Rica	27.2	26.7	27.7	29.8	27.4	28.2	29.2
El Salvador	23.4	23.0	24.1	26.2	23.6	24.3	24.9
Guatemala	29.6	29.2	29.9	32.8	29.7	30.7	32.2
Honduras	24.2	23.8	25.9	25.6	24.4	25.3	26.5
Nicaragua	41.1	40.7	41.9	44.1	41.3	42.5	44.9
Panama	18.3	18.7	20.3	20.6	18.9	19.9	20.9

Table: AVE's

Conclusions

- The results show that trade facilitation variables affect the trade performance
- Our estimates with the gravitational model are similar to those reported in the literature Head y Mayer (2015)
- Our calculations show that the average ad valorem equivalents tariff (AVEs) in Central America is about 30%.

Extensions

- Test the robustness of the result with a cross section GPD in the sectorial estimations
- Include other trade facilitation variables