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Latin American Integration Effects on Trade Relationships: Survival, Growth and Initial Volume

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Abstract:

In this paper, we analyze the effects of economic integration agreements on trade survival, initial volumes of trade, and export growth. We focus on annual trade data at the 5-digit SITC level for Latin America exports to over 150 countries from 1962 to 2009 and examine whether these effects differ depending on the required depth of the agreement. We also test whether the quality of trade agreements has an impact on the survival of trade relationships. Results indicate that the effects of trade agreements in Latin America differ from those found in previous studies; that those effects are also different depending on the trade agreements depth, and that higher quality agreements lead to higher increases in the survival rate of trade relationships.

Keywords: economic integration agreements; Latin America; trade survival; random effects probit

JEL Classification: F14; F15

Introduction

In a previous work (Besedes *et al.* 2015), from now on referred to as BMN, have studied the effects of trade agreements on the survival of trade relationships. Their results, however, must not necessarily be homogeneous across regions as aggregation may hide different trade reactions to economic integration agreements.

For example, (Florensa *et al.* 2014 and Florensa *et al.* 2015) have found that in Latin America, EIA's effect on the intensive and extensive margins of trade, and the effect of institutional variables and the quality of trade agreements differ markedly from those found for the whole world. Whereas (Florensa *et al.* 2011) on the survival of trade relationships in Argentina's provinces-obtain results that are in line with the ones found for developed countries.

In the present paper we focus on Latin America with the objective of testing whether the effects of Economic Integration Agreements (EIAs) on trade survival are similar to those described for the whole world. To this aim, we have applied BMN's methodology.

Our main contributions are the expansion of BMN's work by examining whether these effects differ according to the kind of integration agreement and by analyzing trade duration, growth and initial value sensitivity to trade agreement quality.

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1. Literature review

Several studies have analyzed the duration of trade as well as the determinants of exports survival. (Besedes and Prusa 2006, and Nitsch 2009) analyzed the duration of imports for US and Germany, respectively; (Carrere and Strauss-Khan 2014) studied developing countries exports survival in the OECD. In the same line, (Minondo Uribe-Etxeberria and Requena 2012) consider the length of exports using data for the regions of Spain, and (Florensa *et al.* 2011) analyze the extensive and intensive margins of trade for Argentinian provinces and the determinants of their survival rate.

All the above mentioned papers found that the duration of trade relationships was extremely short. In fact, a high failure rate along with low percentages in the number of long-term trade relationships show the relevant role played by survival. Both (Besedes and Prusa 2006, and Florensa *et al.* 2011) have found that high failure rates of the newly-started relations are not necessarily a consequence of the level at which the products are encoded, and that exports relationships which start with higher values, offer a higher survival rate throughout the service years than those of a smaller initial size. *Furthermore*, in a study for Córdoba (Argentina), (Diaz Cafferata *et al.* 2011), proved one of the (Rauch and Watson 2003) hypotheses: homogeneous goods provincial exports survival rate is lower than that of differentiated ones.

The literature that investigates the effects of EIAs on the length of trade relationships is fairly recent and therefore scarce. (Kamuganga 2012) has studied treaties among African countries and BMN have examined the effect of economic integration agreements on trade relationships length using annual trade for 180 countries. BMN have found that trade agreements significantly increase the survival of those trade relationships which had already started when the agreement took place; however, these agreements increase the hazard of trade ceasing and also reduce the initial volumes for those relationships that started afterwards. The longer the elapsed time since the signature of the agreement, the higher the hazard of trade for both kinds of spells. Therefore, the positive effect of trade agreements on the survival of preexisting spells diminishes over time, whilst the negative effect on new spells worsens.

2. Descriptive data

Throughout this paper we will consider three different 'levels' of EIAs, in accordance with (Baier and Bergstrand 2007). The weakest, or 'shallowest', form of integration we consider is Non Reciprocal Preferential Trade Agreements (NRPTA), labeled 'Level 1 EIAs'. These are unilateral agreements, by which developed nations concede trade benefits to developing countries by granting "the most favored nation" status. These type of agreements are usually extended to several countries at once

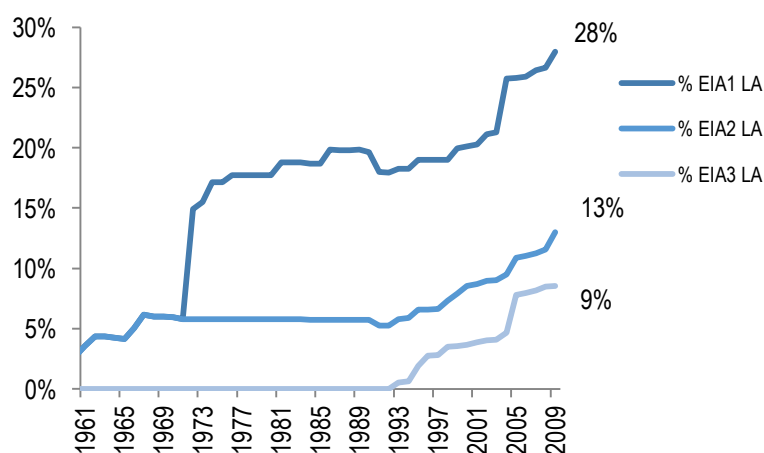
A second level of integration, considered 'deeper', as it entails a bilateral negotiation, is Preferential Trade Agreements, by which two countries grant each other special trade benefits. Finally, we consider a third class of agreements which comprehends the 'deepest' levels of integration: Free Trade Agreements, Customs Unions, Common Markets, and Economic Unions, though the latter two are not present in Latin America.

Figure 1 shows the evolution of utilization rates²⁶ of Latin American EIAs over time for three different minimum levels required to consider an agreement as an EIA. Whereas global trade integration grew substantially at the beginning of the seventies, when the utilization of EIA jumped from 2.5% to over 10%, a similar pattern can be seen in Latin America, where the percentage of trade relationships with trade agreements increased from less than 10% to about 20% in a few years. The utilization rate has grown ever since, with a new upward shift at mid-2000s; it has now reached 21% for the world and 28% for Latin America.²⁷

²⁶ We define the utilization rate as ratio between the country pairs that have signed an EIA and total number of country pairs.

²⁷ All utilization rates referring the world were taken from (Besedes *et al.* 2015).

Figure 1. Utilization rates for Latin America



Source: own calculation based on (Bergstrand 2015)

In Latin America, in particular, these trade agreements have been mostly shallow. Most of the integration that took place in the early seventies has taken the form of NRPTA (EIAs of Level 1). It was during the mid-nineties that deep integration began to take place with the creation of MERCOSUR and the proliferation of Free Trade Agreements, signed mainly by Chile, Colombia and Peru. Consequently, the utilization rate for EIAs of level 3 or higher (Free Trade Agreements and Custom Unions) rose from less than 1% in 1990 to 5% in 2000 and 9% in 2009. The Appendix contains a list of all trade agreements considered and their classification.

Table 1. Survival of trade relationships for Latin America 1962-2009

Spell length	Number of spells	Fraction of spells
1	271,083	49.24%
2	76,094	13.82%
3	41,160	7.48%
4	26,521	4.82%
5	20,737	3.77%
6	15,498	2.82%
7	12,434	2.26%
8	10,783	1.96%
9	8,657	1.57%
10	7,982	1.45%
11-20	36,684	6.66%
21-30	13,900	2.52%
31-40	6,921	1.26%
40 +	2,093	0.38%
TOTAL	550,547	100%

Source: own calculation based on WITS.

Table 1 shows that almost half of trade relationships in Latin America do not survive past their first year, 70% fail by year 3 and almost 90% have ceased by year 10. Less than ten thousand (about 1.64%) of the more than half a million spells included in our sample survived more than 30 years. Albeit low, these survival rates are in fact higher than those for the whole world. The world's survival rate for 1, 3, 10 and 30 years are 45%, 22%, 7% and 1.4%, respectively, even lower than for Latin America in all cases.

3. Methodology

a. Empirical strategy

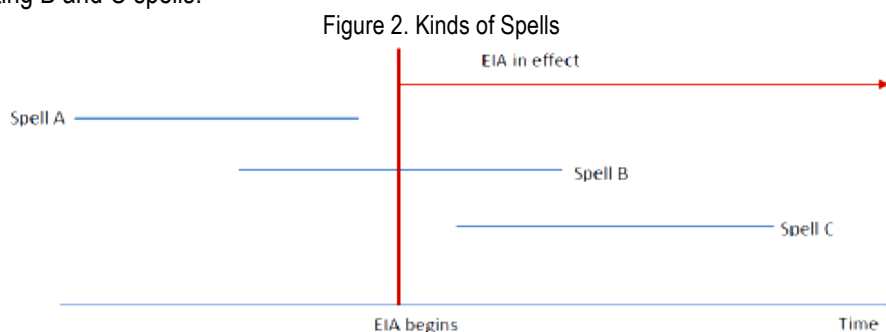
BMN's methodology was followed and a random effects logit²⁸ was run for the probability of trade ceasing and a fixed effects panel regression was run for the growth and initial value of exports. In all regressions, only the founders of the Latin American Integration Association (LAIA), Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru, Uruguay and Venezuela, were considered.

a.1. Random Effects Logit

The focus of attention has been the effects of an EIA on the hazard of trade ceasing. Figure 2 reproduces BMN's Figure 2, in which three kinds of spells are differentiated. Spells such as spell A start and end before the agreement goes into effect; spells such as spell B start before the agreement takes place but do not end until it has taken effect; finally, spells such as spell C start and end after an agreement has taken place.

In order to capture the different effects an EIA may have on trade hazard, BMN's methodology was followed and three dummy variables were constructed. The first one, 'EIA exists', identifies all pairs of countries which have ever had an agreement, whether it has already taken place or not. This variable allows analyzing whether spells such as A have different hazards than spells between countries which never sign an agreement. Thus, we control for possible endogeneity of EIAs, that is, countries with unusually long – or short - spells may tend to sign more agreements.

The second dummy variable, 'EIA in effect', identifies the years following the signing of an agreement, as shown in Figure 2. This allows us to distinguish between A and B spells but not between B and C ones. The third dummy variable is called 'Spell starts after EIA' and identifies those spells that started after the agreement has taken place thus differentiating B and C spells.



Source: (Besedes *et al.* 2011)

The definition of what constitutes an EIA is crucial for a region such as Latin America. Many developed countries have granted LA countries the "most favored nation" status (Non Reciprocal Preferential Trade Agreement, NRPTA), which is considered an EIA by (Baier and Bergstrand 2007) and the specific literature. However, this kind of agreement does not necessarily entail serious integration intentions, and therefore, their characteristics may be different from those of the deeper agreements signed since the 90s. Moreover, as all Latin American countries have received these benefits, it would be impossible to distinguish them from the Free Trade Agreements signed afterwards. For this reason, we have constructed the dummy variables considering three minimum levels of integration for an agreement to be considered an EIA.

The first criterion considers all agreements registered on the WTO as an EIA. This is the one followed by BMN and allows us to compare our main results. The next two criteria require an agreement to be classified at least

²⁸ Besedes *et al.* (2015) run a random effects probit, whereas we use a logit because of computational limitations. As a robustness test, we have run a logit model using the same sample they do and we have found identical signs (these results are available upon request). Therefore, we believe we can compare our results with theirs without worrying about differences on the marginal effects.

as a Preferential Trade Agreement by WTO or as a Free Trade Agreement, respectively²⁹. This discrimination lets us examine whether the effects of economic integration on the hazard of trade ceasing vary depending on the depth of the agreement. A random effects logit was run using the ones considered in the literature of duration of trade as explanatory variables: the spell current length at every point in time, the exports initial volume, exporter and importer GDP, distance, common border, and common language (Besedes 2008, and Fugazza and Molina 2011).

Four specifications to measure the effects of trade integration were considered. The first one, adds the dummies 'EIA exists' and 'EIA in effect' to the standard variables. The second specification includes the additional dummy 'Spell starts after EIA'; the third specification adds a fourth dummy, Years since EIA, which measures the length an agreement has been in place. This variable allows the identification of whether the effect of an agreement depends on the time span it has been in place, either diminishing in time as its effect dilutes, or increasing as its effects consolidate through time.

The last specification explores the quality of trade agreements, a feature that could distinguish LA countries from the rest of the world. Many attempts at promoting economic integration have failed throughout time, among which LAIA, the ANDEAN community, and now allegedly MERCOSUR - (Peña 2016) - can be mentioned. However, the usual depth measures of an EIA do not consider how many of its provisions have been actually enforced. Therefore, in our fourth specification, we have included the variable constructed by (Kohl *et al.* 2016) which measures trade integration agreements quality in addition to the three dummy variables that we have considered. It is expected that the sign of this variable be negative, as higher quality of trade agreements should promote the survival of trade relationships. There is no *a priori* hypothesis on how its effects vary across spells of the type A, B, or C. Each specification was run three times, once for each minimum level of integration considered.

a.2. Fixed effects panel regression

A panel regression for the growth and initial volume of exports, including country pair, time, and 3-digit SITC code fixed effects was run. Export growth was defined as:

$$XGrowth_t = \frac{export_t - export_{t-1}}{export_{t-1}} \quad (1)$$

All regressions are run in logarithms and, as in our trade hazard analysis, three different minimum levels of integration for EIAs were considered.

b. Data sources

Exports from the eleven founding LAIA countries – Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru and Venezuela – to 157 countries were analyzed for the period 1962-2009. Trade data were obtained from WITS, and were classified according to the 5-digit Standard Industrial Trade Classification (SITC), Revision 1. The variable indicating the level of integration between country pairs takes the form of a polychotomous index built by (Baier *et al.* 2014).

Exporter and importer GDPs were measured in current dollars and were obtained from the World Development Indicators provided by the World Bank; distance, adjacency and common language were obtained from CEPII. The trade agreements quality index constructed by (Kohl *et al.* 2016) was utilized. It measures trade agreements heterogeneity and it takes values between 0 (lowest institutional quality) and 1 (highest institutional quality). The database contains a list of 296 agreements (43 including LAIA countries) and provides a set of indexes for each agreement. The simple average of the indexes of Coverage, Index(C), and of Enforceability, Index (E) was used. When a pair of countries has entered into more than one agreement³⁰, the one with the greatest resulting value was considered.

²⁹ Baier *et al.* (2014) also consider Customs Unions, Common Markets and Economic Unions; we do not include them as a separate threshold as they are scarces or they do not exist in Latin America.

³⁰ For example, Argentina and Bolivia are currently signatories of three agreements: they both are LAIA members since 1981 with an index value of 0.20. Bolivia signed a treaty with MERCOSUR in 1997 with an index of 0.39 and signed another treaty as a member of the Andean Community in 1998 with an index of 0.27.

4. Results

Following BMN, we first examine the effects of EIAs on trade ceasing hazard. Afterwards, we analyze its impact on the growth of trade volume within each spell, and finally we examine the effects on the initial volume of each spell. Within each of these characteristics, we distinguish the effects of different kinds of agreements.

a. Hazard

We estimate trade ceasing hazard by using a random effects logit which allows us to control for unobserved heterogeneity. As usual in the specific literature, we assume that hazard depends on the logarithm of the duration of the spell, measured in years. Results are presented in Table 2. All standard variables have the expected signs and the magnitudes are similar to those found by BMN; these results do not vary across different definitions of EIA. However, the similarities become nuanced when the impact of the EIA dummies is compared. The specifications that should be used as a direct comparison with BMN are those labeled as EIA ≥ 1 .

In parallel to the results for the whole world, the existence of an EIA for a pair of countries ('EIA exists') decreases the hazard of trade ceasing. This effect is maintained across all specifications, although its effect is somewhat lower for deeper trade agreements (-0.19 for EIA ≥ 1 , -0.164 for EIA ≥ 2 and -0.117 for EIA ≥ 3). This implies that countries which have signed an EIA at any point of the sample period have a lower risk than those that have not. Therefore, EIAs in Latin America could be seen as a way of reinforcing otherwise relatively safe trade relationships.

However, and conversely to the results for the whole world, in specification 1, an active EIA has a positive but non-significant effect on the hazard of trade ceasing, that is, the effect of the EIA over the survival of trade is nil. For EIAs greater or equal than 2 (PTA or higher), the result is negative and non-significant. Finally, when we only consider FTAs or deeper, the coefficient has a negative sign and is highly significant. This result is contrary to that found by BMN, in which an EIA in effect increased the hazard of trade. For Latin America, countries with an economic integration agreement start with a low level hazard, and the signing of a shallow EIA has no additional effect. However, when the EIA is deep enough, the final effect is the reduction of the overall exports hazard.

In our second specification, which considers whether a spell starts before or after an EIA has been signed, we also find that the effect of an EIA depends on the depth of the trade agreement. Considering the shallower agreements as a threshold (NRPTA and PTA, EIAs 1 and 2 respectively), we find that EIAs lower the hazard of trade ceasing for those spells that began after the signing of the agreement, but rise the risk for the already existing spells in opposition to the results found by BMN for the world as a whole. When setting a higher bar for an agreement to be counted as an EIA, however, the results vary: an integration agreement benefits both the spells that had started at the time of its signing and those that come afterwards. The comparison with our previous specification reveals that the nil effect of EIAs in effect on hazard for shallow EIAs was the result of a combination of an increase in the hazard of the existing spells and a reduction in the ones that start afterwards. On the other hand, the reduction in risk produced by the deeper EIAs benefits both preexisting and new trade relationships.

In our third specification, which takes into account time (in years) since the signing of the EIA, the effects once again differ from those for the whole world and across levels of trade agreements. Whereas hazard increases as more time elapses since the signing of an EIA for the whole world, the opposite is true for Latin America. For the shallower EIAs, their impact on trade hazard is positive both for those spells which were already ongoing at the time of the signing and for those that start afterwards. As time passes, however, hazard is steadily reduced. The same happens for deeper EIAs, although the initial effect is a reduction of risk for all spells, those that start after the signing and those that had started before. Contrarily to BMN, in Latin America, the older the agreements, the more effective they become. Besides, this effect doubles for FTAs. These results suggest that trade agreements implementation and enforcement are important issues and that time is needed to achieve full effect.

Finally, specification 4 incorporates trade agreement quality, as measured by (Kohl *et al.* 2016), into the explanatory variables. We find that its effect on trade hazard is significant and negative as expected; that is, the better the quality of an agreement, the higher the survival rate of trade relationships. The addition of this variable reduces the coefficient of "EIA exists" thus suggesting that the effect of an EIA depends on its quality. This result is particularly relevant for Latin America, where economic integration agreements abound (there are two customs unions in effect – Mercosur and Andean) but their quality is particularly low.

Table 2. The Effect of EIA on the Hazard of Trade Ceasing

	EIA >= 1				EIA >= 2				EIA >= 3			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Spell Duration (ln)	-0.591***	-0.595***	-0.549***	-0.548***	-0.591***	-0.594***	-0.567***	-0.561***	-0.569***	-0.574***	-0.566***	-0.564***
	-207,96	-207,50	-179,40	-178,84	-208,03	-207,66	-191,04	-189,32	-197,06	-195,66	-190,31	-188,79
Initial Exports (ln)	-0.114***	-0.114***	-0.119***	-0.119***	-0.113***	-0.113***	-0.116***	-0.118***	-0.118***	-0.118***	-0.119***	-0.119***
	-107,11	-106,83	-109,04	-109,5	-106,34	-106,32	-107,32	-108,67	-108,80	-109,02	-109,35	-109,34
Exporter GDP (ln)	-0.258***	-0.259***	-0.256***	-0.250***	-0.249***	-0.251***	-0.250***	-0.246***	-0.247***	-0.248***	-0.248***	-0.247***
	-115,52	-115,58	-112,60	-109,66	-111,20	-111,48	-110,3	-108,28	-109,87	-109,89	-109,98	-109,08
Importer GDP (ln)	-0.081***	-0.080***	-0.073***	-0.075***	-0.094***	-0.093***	-0.088***	-0.086***	-0.089***	-0.089***	-0.089***	-0.088***
	-51,50	-50,61	-44,78	-45,7	-64,58	-64,33	-59,96	-58	-60,53	-60,23	-59,99	-59,6
Distance (ln)	0.257***	0.257***	0.258***	0.252***	0.254***	0.253***	0.257***	0.257***	0.250***	0.248***	0.244***	0.244***
	46,49	46,47	45,43	44,09	45,66	45,52	45,33	45,04	44,47	44,17	43,35	43,13
Adjacency	-0.029***	-0.021**	0.018*	0.037***	-0.003	0.012	0.057***	0.042***	0.039***	0.039***	0.044***	0.046***
	-2,77	-2,04	1,68	3,42	-0,29	1,12	5,17	3,8	3,51	3,53	3,94	4,12
Common Language	-0.251***	-0.249***	-0.222***	-0.207***	-0.215***	-0.208***	-0.166***	-0.189***	-0.207***	-0.206***	-0.206***	-0.203***
	-30,78	-30,48	-26,38	-24,43	-25,54	-24,56	-19,15	-21,52	-24,59	-20,14	-24,38	-23,93
EIA Exists	-0.190***	-0.183***	-0.160***	-0.153***	-0.164***	-0.156***	-0.142***	-0.129***	-0.117***	-0.116***	-0.121***	-0.095***
	-18,81	-18,04	-15,45	-14,75	-18,69	-17,72	-15,89	-14,29	-15,68	-15,47	-16,11	-12,19
EIA is in Effect	0.007	0.101***	0.107***	0.131***	-0.003	0.095***	0.099***	0.335***	-0.269***	-0.207***	-0.142***	-0.067***
	0,81	7,78	8,20	10,01	-0,34	7,04	7,30	21,71	-35,22	-20,14	-12,73	-5,28
Spell Starts After EIA		-0.112***	0.106***	0.072***		-0.131***	0.109***	-0,024		-0.112***	-0.024*	-0,018
		-9,95	8,59	5,75		-9,77	7,35	-1,55		-8,91	-1,74	-1,26
Years Since EIA			-0.012***	-0.010***			-0.012***	-0.009***			-0.022***	-0.023***
			-44,59	-33,71			-37,43	-27,55			-14,25	-14,59
Quality of the Agreement				-0.292***				-0.527***				-0.212***
				-21,38				-32,14				-12,1
Constant	6.610***	6.591***	6.297***	6.255***	6.635***	6.664***	6.479***	6.318***	6.504***	6.519***	6.559***	6.516***
	77,65	77,35	72,48	71,89	78,09	78,34	75,19	73,03	75,83	78,92	76,22	75,58
Observations	1.817.136	1.817.136	1.817.136	1.817.136	1.817.136	1.817.136	1.817.136	1.817.136	1.817.136	1.817.136	1.817.136	1.817.136
Wald Chi Sq.	122.069	121.973	119.558	119.435	121.837	122.013	120.315	120.107	120.190	120.483	119.804	119.574
Log Likelihood	-852.782	-852.733	-851.711	-851.479	-852.835	-852.788	-852.073	-851.547	-852.062	-852.022	-851.919	-851.845

Notes: ***, **, * indicate significance at 1, 5 and 10%, respectively

Source: own calculation

b. Trade Growth

We estimate the effects of EIAs on trade growth by running a fixed effects panel regression on exports growth. The standard variables – spell duration, initial exports, exporter's GDP and importer's GDP, distance, common language and adjacency – are all significant, they have the expected signs and their coefficients don't vary much across specifications and definitions of EIA (Table 3).

The variable 'EIA exists' has a positive and significant effect for all specifications in which agreements of level 2 or higher are considered. This implies that countries that sign trade agreements are the ones whose trade already had a high growth rate. The presence of a trade agreement – 'EIA in effect' – also has a positive effect that persists throughout all specifications, though it is non-significant for some specifications when the deeper EIAs are considered.

The effect on EIAs that start after the agreement has entered in effect, on the other hand, is consistently nil. The impact of the signing of EIAs on growth rates seems to be evenly distributed between existing and new spells. However, as time passes, the effect of an agreement on trade decreases, as can be seen in the coefficient of the variable 'Years since EIA', which is negative in all cases. This implies that trade agreements have a positive effect on trade growth that declines over time, in contrast with its effect on hazard, which increases. Finally, the quality of trade agreements has a positive effect on growth for EIAs when considering EIAs ≥ 1 and EIAs ≥ 3). The effect is nil when considering both PTAs and FTAs.

c. Initial Volume of Trade

We finally run a fixed effect panel regression on the initial volume of trade (Table 4). The usual variables have the expected sign: exporter and importer's GDPs and adjacency have a positive sign, and distance has a negative one. Contrary to expectations, common language has a negative sign, which is always significant across specifications and different levels of agreements.

Our interest; however, lays in the effect of the integration dummies. The variable 'EIA exists' is consistently negative and significant implying that countries that have signed an integration agreement at some point of the sample usually have lower initial volumes of trade. The variable 'EIA in effect', conversely, varies depending on the depth of integration. For shallower EIAs, the initial volume of trade is increased, whereas for deeper ones it is decreased. Something similar occurs with the time elapsed since EIAs are signed: it has a positive sign for EIAs ≥ 1 , and a negative one for deeper agreements. Finally, trade agreements quality reduces the initial trade volumes for shallower EIAs, while it has a nil effect for FTAs.

Table 3. The Effect of EIA on the Growth of Trade

	EIA >= 1				EIA >= 2				EIA >= 3			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Spell	-0.281***	-0.281***	-0.278***	-0.279***	-0.282***	-0.282***	-0.282***	-0.282***	-0.280***	-0.280***	-0.277***	-0.277***
Duration (ln)	-11,521	-11,521	-11,399	-11,445	-11,571	-11,584	-11,584	-11,566	-11,503	-11,503	-11,368	-11,354
Initial	-0.037***	-0.037***	-0.037***	-0.037***	-0.037***	-0.037***	-0.037***	-0.037***	-0.037***	-0.037***	-0.037***	-0.037***
Exports (ln)	-64,176	-64,037	-64,044	-64,125	-64,335	-64,333	-64,331	-64,350	-64,075	-63,956	-63,773	-63,815
Exporter	0.016***	0.016***	0.016***	0.016***	0.016***	0.016***	0.016***	0.016***	0.016***	0.016***	0.016***	0.016***
GDP (ln)	23,733	23,734	23,767	23,974	25,783	25,783	25,756	25,784	25,508	25,475	25,543	25,388
Importer	0.011***	0.011***	0.010***	0.010***	0.009***	0.009***	0.009***	0.009***	0.010***	0.010***	0.009***	0.009***
GDP (ln)	9,833	9,735	9,539	8,791	8,335	8,340	8,337	8,309	8,902	8,899	8,845	8,728
Distance (ln)	0.004*	0.004*	0.004*	0.006***	0.008***	0.008***	0.008***	0.007***	0.006***	0.006***	0.006**	0.006**
	1,726	1,732	1,751	2,660	3,359	3,353	3,347	3,226	2,738	2,735	2,412	2,500
Adjacency	0.016***	0.017***	0.018***	0.014***	0,006	0,005	0,005	0,006	0.010**	0.010**	0.010**	0.010**
	4,206	4,218	4,497	3,522	1,468	1,338	1,319	1,437	2,379	2,379	2,499	2,409
Common	0.014***	0.014***	0.014***	0.013***	0,005	0,005	0,005	0,005	0.010***	0.010***	0.010***	0.011***
Language	4,095	4,079	4,134	3,921	1,519	1,480	1,466	1,296	3,030	3,029	2,977	3,051
EIA Exists	-0,010	-0,009	-0,007	-0,011*	0,013***	0,013***	0,013***	0,014***	0,017***	0,017***	0,017***	0,013***
	-1,557	-1,524	-1,181	-1,722	3,123	3,128	3,107	3,299	4,853	4,850	4,830	3,584
EIA is in	0.017***	0.018***	0.019***	0.015**	0.022***	0.020***	0.020***	0.026***	0.006*	0,006	0.015***	0,007
Effect	2,954	2,767	2,971	2,329	5,109	3,683	3,678	3,841	1,667	1,564	3,066	1,226
Spell Starts		-0,002	0,004	0,007		0,003	0,002	-0,001		-	0,007	0,008
After EIA		-0,373	0,869	1,457		0,578	0,331	-0,136		0,029	1,187	1,232
Years Since			-0.000**	-0.000***			0.000	0.000			-0.002***	-0.002***
EIA			-2,116	-2,941			0,114	0,187			-3,170	-3,208
Quality of the				0.038***				-0,012				0.025***
Agreement				6,538				-1,430				3,058
Observations	571.855	571.855	571.855	571.855	571.855	571.855	571.855	571.855	571.855	571.855	571.855	571.855
R2 Within	0,008181	0,008184	0,008209	0,008212	0,008192	0,008190	0,008190	0,008193	0,008165	0,008165	0,008196	0,008200
R2 Between	0,036312	0,036320	0,036366	0,036442	0,036590	0,036595	0,036594	0,036635	0,036397	0,036397	0,036373	0,036358
R2 Overall	0,019520	0,019520	0,019526	0,019607	0,019745	0,019745	0,019745	0,019748	0,019593	0,019593	0,019610	0,019628
RMSE	0,836846	0,836846	0,836835	0,836816	0,836800	0,836807	0,836807	0,836826	0,836831	0,836830	0,836817	0,836808

Notes: ***, **, * indicate significance at 1, 5 and 10%, respectively

Source: own calculation

Table 4. The Effect of EIA on the Initial Volume of Trade

	EIA >= 1			EIA >= 2			EIA >= 3		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Importer GDP (ln)	0.149***	0.148***	0.147***	0.124***	0.130***	0.131***	0.127***	0.128***	0.128***
	71,160	70,216	69,858	65,554	68,381	68,692	66,706	67,128	67,095
Exporter GDP (ln)	0.106***	0.107***	0.108***	0.111***	0.107***	0.107***	0.109***	0.107***	0.107***
	36,246	36,456	36,655	37,410	36,072	36,094	36,901	36,375	36,367
Distance (ln)	-0.053***	-0.051***	-0.053***	-0.030***	-0.037***	-0.038***	-0.041***	-0.049***	-0.049***
	-7,048	-6,729	-6,958	-3,974	-4,877	-4,997	-5,392	-6,432	-6,399
Adjacency	0.115***	0.104***	0.111***	0.081***	0.149***	0.142***	0.120***	0.127***	0.127***
	7,870	7,081	7,493	5,351	9,749	9,259	7,839	8,298	8,275
Common Language	-0.149***	-0.152***	-0.147***	-0.165***	-0.119***	-0.129***	-0.150***	-0.148***	-0.148***
	-13,369	-13,592	-13,110	-14,218	-10,109	-10,977	-13,116	-12,936	-12,958
EIA Exist	-0.370***	-0.390***	-0.384***	-0.139***	-0.094***	-0.082***	-0.021**	-0.022**	-0.025**
	-26,911	-27,418	-26,878	-11,756	-7,919	-6,866	-2,005	-2,140	-2,338
EIA is in Effect	0.100***	0.076***	0.075***	0.113***	0.287***	0.345***	-0.198***	-0.033**	-0.042**
	8,226	5,869	5,799	9,081	20,899	23,316	-17,149	-2,197	-2,398
Years Since EIA		0.002***	0.003***		-0.013***	-0.012***		-0.036***	-0.035***
		5,476	6,360		-30,051	-28,201		-16,980	-16,889
Quality of the Agreement			-0.088***			-0.238***			0,025
			-4,615			-10,501			1,002
Constant	-4.810***	-4.833***	-4.821***	-4.645***	-4.612***	-4.605***	-4.522***	-4.399***	-4.401***
	-35,802	-35,955	-35,862	-34,480	-34,237	-34,196	-33,563	-32,602	-32,611
Observations	522.619	522.619	522.619	522.619	522.619	522.619	522.619	522.619	522.619
R2 Within	0,046	0,045	0,046	0,046	0,048	0,048	0,046	0,047	0,047
R2 Between	0,250	0,250	0,250	0,246	0,247	0,247	0,247	0,247	0,247
R2 Overall	0,196	0,196	0,196	0,194	0,195	0,195	0,194	0,194	0,194
RMSE	1,706	1,706	1,706	1,705	1,702	1,703	1,705	1,704	1,704

Notes: ***, **, * indicate significance at 1, 5 and 10%, respectively

Source: own calculation

Conclusions

In this paper we have applied (Besedes *et al.* 2011) methodology to test the effects of Latin America Economic Integration Agreements (EIAs) on trade survival, initial volumes of trade relationships and export growth. We have found that their results do not necessarily hold when examining the Latin American experience, as several of their dummy variables reverse their signs. We have also found that the effects on trade depend heavily on the depth of the agreements considered for this region. These results should warn us against conducting worldwide analyses, as regional differences may be lost when aggregating, especially in regions with fewer spells. Our empirical analysis allows us to conclude that:

- economic Integration Agreements have a positive effect on the survival rate of trade; however, this effect is lower for deeper trade agreements. Therefore, countries which have signed an EIA face a lower risk than those that have not.
- for spells started before the agreement signing and continued afterwards, the effect depends on the depth of the agreement: only agreements that are FTAs or deeper have a significant positive effect.
- spells started after an EIA has been signed face a low risk of trade ceasing, however the magnitude of this significant effect depends on the depth of the integration agreement.
- the hazard rate decreases as time elapses since the signing of an EIA both for those spells which were already ongoing at the time of the signing and for those that started afterwards.
- regarding the effect of trade agreements quality, higher quality agreements lead to higher increases on the survival rate of trade relationships.
- when trade growth is taken as a dependent variable, the estimated coefficients suggest that countries that signed trade agreements are those whose trade has already had a high growth rate. The signing of an EIA has a positive effect on growth, though this effect decreases overtime.
- finally, the evaluation of the effect on the initial volume of trade shows that countries that have signed an integration agreement have lower initial volumes of trade. However, for spells that started before the agreement and continued afterwards, the effect depends on the depth of integration: for shallower ones the effect is positive whereas for deeper EIAs it is negative.

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Appendix

List of Latin American Economic Integration Agreements

EIA 1: Non Reciprocal Preferential Trade Agreements (NRPTA)

- European Union GSP¹ (1971);
- Japan GSP (1971);
- Norway GSP (1971);
- Liechtenstein GSP (1972);
- New Zealand GSP (1972);
- Switzerland GSP (1972);
- Australia GSP (1974);
- Canada GSP (1974);
- United States GSP (1976);
- Russia GSP (1994);
- Iceland GSP (2000);
- Turkey GSP (2002);
- Belarus GSP (2004).

EIA 2: Preferential Trade Agreements (PTA)

- Latin American Free Trade Association – LAFTA (1960-1980), conformed by Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru, Uruguay and Venezuela;
- Andean Community – CAN (1969-1995), conformed by Bolivia, Colombia, Ecuador and Peru;
- Latin American Integration Association – LAIA- (1981), conformed by Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru, Uruguay and Venezuela. Cuba joined in 1999;
- Venezuela – CARICOM²(1993);
- Colombia - CARICOM (1995).

EIA 3: Free Trade Agreements (FTA), Customs Unions (CU), Common Markets (CM) and Economic Unions (EU)

- Andean Community– CAN (1969), conformed by Bolivia, Chile, Colombia, Ecuador and Peru. Chile left in 1976; Venezuela joined in 1973 and left in 2006;
- Venezuela – Guatemala (1987);
- MERCOSUR (1991), conformed by Argentina, Brazil, Paraguay and Uruguay;
- Bolivia – Chile (1993);
- Chile – Venezuela (1993);
- Andean Community (1995) became a Customs Union;
- Bolivia – Mexico (1995);
- Colombia – Mexico (1995);
- Mexico – Costa Rica (1995);
- North American Free Trade Agreement – NAFTA (1995), conformed by Canada, Mexico and the United States;
- Chile – MERCOSUR (1996);
- Chile – Canada (1997);
- Chile – Peru (1998);
- Mexico – Nicaragua (1998);
- Chile – Mexico (1999);
- Mexico – European Union (2000);

¹ Generalized system of preferences.

² Conformed by Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, Montserrat, Saint Lucia, St. Kitts and Nevis, St. Vincent and the Grenadines, Suriname and Trinidad and Tobago. Haiti joined in 2002.

- Mexico – Israel (2000);
- Mexico – EFTA³ (2001);
- Mexico – Northern Triangle⁴ (2001);
- Chile – Central America⁵ (2002);
- Chile – Costa Rica (2002);
- Chile – El Salvador (2002);
- Chile – European Union (2003);
- Chile – EFTA (2004);
- Chile – Korea (2004);
- Chile – United States (2004);
- CAN – MERCOSUR (2005);
- Mexico – Japan (2005);
- Trans-Pacific Strategic Economic Partnership – TPSEP (2006), conformed by Brunei, Chile, New Zealand and Singapore;
- Chile – China (2007);
- Chile – Honduras (2008);
- Chile – India (2008);
- Chile – Japan (2008);
- Chile – Colombia (2009);
- Chile – Panama (2009);
- Peru – United States (2009).

³ Conformed by Iceland, Liechtenstein, Norway and Switzerland.

⁴ Conformed by El Salvador, Guatemala and Honduras.

⁵ Conformed by Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua.

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