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Latin American integration and the survival of trade relationships

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Abstract

In a previous work, Besedes et al. (2015) studied the effects of trade agreements on the survival of trade relationships. Their main results were that trade agreements significantly increase the survival of trade relationships which had already started when the agreement takes place. Moreover, they find that these agreements increase the hazard and reduce the initial volumes for those that start afterwards. These results, however, may not be homogeneous across regions as aggregation may hide different reactions of trade to economic integration agreements (EIAs). In the present paper we use annual trade data at the 5-digit SITC level for Latin America exports to over 150 countries from 1962 to 2009. We analyze whether the effects of EIAs on trade survival, initial volumes of trade and export growth are the same as those described for the whole world (mostly, they are not). As our main contribution, we examine if these effects differ depending on the required depth for an agreement to be considered as an EIA (they do). We also test if the quality of trade agreements, as measured by Kohl et al. (2016) has an impact on the survival of trade relationships (it does).

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

JEL code: F14, F15

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1. Introduction

In a previous work, Besedes, Moreno-Cruz and Nitsch (2015), from now on referred to as BMN, studied the effects of trade agreements on the survival of trade relationships. Their main findings were that trade agreements significantly increase the survival of trade relationships which had already started when the agreement takes place. Moreover, they find that these agreements increase the hazard and reduce the initial volumes for those that start afterwards.

These results, however, must not necessarily be homogeneous across regions as aggregation may hide different reactions of trade to economic integration agreements. Florensa et al. (2014, 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. Nonetheless, Florensa et al. (2011, 2012) worked on the survival of trade relationships in Argentina's and Brazil's provinces and they found results in line with the ones found for developed countries. Firstly, they found that the duration of exports relationships is extremely short, 50% of them fall within the first two years and the relations lasting throughout a period throw a low percentage. Secondly, export relations started with higher values offer a higher survival rate with respect to those of a smaller size throughout the service years. Finally, the high failure rates of the newly-started relations are not the consequence of the level the products are encoded at.

However, the above mentioned papers have not taken into account the effects that economic integration agreements might have had on the survival of trade relationships.

In the present paper we apply BMN methodology exclusively to Latin America, to test whether the effects of Economic Integration Agreements (EIAs) on trade survival are equal to those described for the whole world. Our main contributions consist in expanding their work by examining if these effects differ depending on the kind of integration agreement and analyzing if they are sensitive to the quality of trade agreements. We do this by requiring successively higher integration levels in order to count an agreement as an EIA. We first take into account every agreement as an EIA as BMN do. Then, we consider only Preferential Trade Agreements or deeper (thus discarding Non Reciprocal Preferential Trade Agreements), and lastly we take into account only Free Trade Agreements and Customs Unions. Finally, we test if the quality of an agreement has an impact on survival, growth and initial volume of trade, by using the novel Kohl et al. (2016) index.

The rest of the article is organized as follows. Section 2 reviews the relevant literature; Section 3 relates the present state and evolution of Latin American economic integration; Section 4 describes the methodology; Section 5 presents the main results and Section 6 concludes.

2. Literature review

Several studies have analyzed the duration of trade as well as the determinants of exports survival; however, the literature that investigates the effects of EIAs on the length of trade relationships is fairly recent and therefore scarce.

Among the former, we can mention Besedes and Prusa (2006) and Nitsch (2009), which analyzed the duration of imports for US and Germany, respectively; Carrere and Strauss-Khan (2013) that studied developing countries exports survival in the OECD; Minondo Uribe-Etxeberria and Requena (2012) that also considers the length of exports using data for the regions of Spain and Florensa et al. (2010), that analyzes the extensive and intensive margins of trade for Argentina provinces and the determinants of their survival rate.

All the above mentioned papers found that the duration of trade relationships was extremely short. 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. (2010) found that high failure rates of the newly-started relations are not 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 with respect to those of a smaller initial size. Furthermore, Diaz Cafferata et al. (2011), in a study for Córdoba (Argentina) prove one of the Rauch and Watson (2003) hypothesis: the survival rate of provincial exports of homogeneous goods is lower than that of differentiated ones.

With regard to literature that considers the relationship between economic integration and survival, we can mention Kamuganga (2012) which studies treaties between African countries and BMN that examine how economic integration agreements affect the length of trade relationships using annual trade for 180 countries.

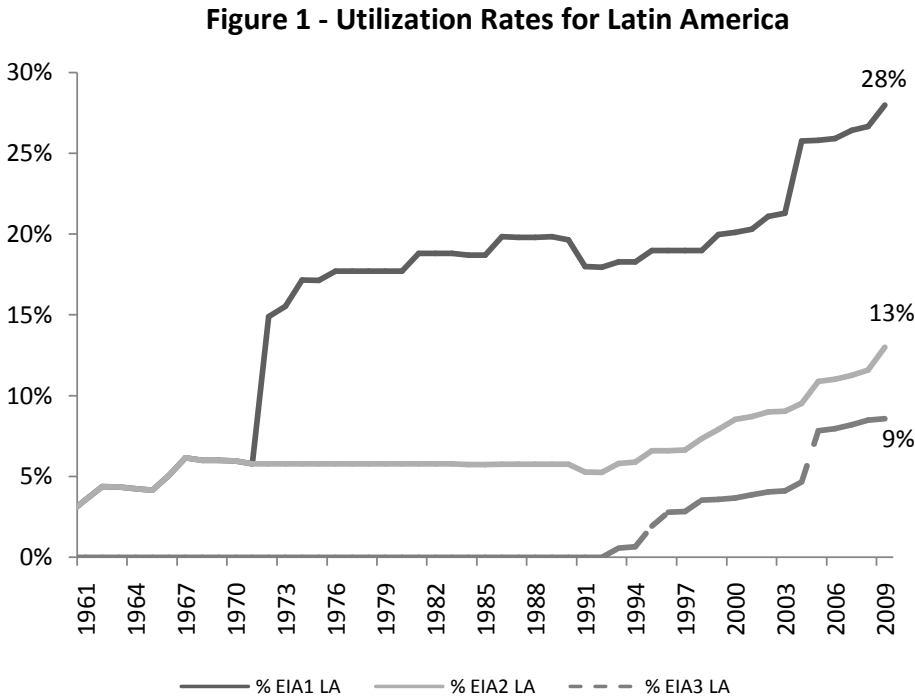
These last authors find that trade agreements significantly increase the survival of trade relationships which had already started when the agreement takes place; however these agreements increase the hazard of trade ceasing and reduce the initial volumes for those relationships that start afterwards. As the elapsed time since the signature of the agreement increases, the hazard of trade rises for both kinds of spells. Therefore, over time, the positive effect of trade agreements on the survival of preexisting spells diminishes, whilst the negative effect on new spells worsens. This pattern may be due to trade agreements helping to solidify the exports of traditional goods, increasing their survival rates, and encouraging the export of goods in which the country has fewer comparative advantages and are thus riskier and more prone to failure.

3. Descriptive data

Throughout this paper we will consider three different 'levels' of Economic Integration Agreements (EIAs), similar to those defined by Baier and Bergstrand (2007). The weakest (or 'shallowest') form of integration that we consider are Non Reciprocal Preferential Trade Agreements (NRPTA), which we label as 'Level 1 EIAs'. These are unilateral agreements, usually extended to several countries at once, by which developed nations grant developing countries the 'most favored nation' status, which concedes them trade benefits. A second level of integration, which we consider as 'deeper' as it entails a bilateral negotiation, are Preferential Trade Agreements, by which two countries grant each other special trade benefits short of free trade. 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 (although the latter two are not present in Latin America).

Figure 1 shows the evolution of utilization rates¹ of EIA over time for three different minimum levels required to consider an agreement as an EIA. 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.²



¹We define the utilization rate as the ratio between the country pairs that have signed an EIA and the total number of country pairs.

²All utilization rates referring the world were taken from Besedes et al. (2015).

In Latin America, however, these trade agreements have been mostly shallow. Most of the integration that took place in the early seventies took 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. In consequence, 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. Table A in 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: authors, 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. Of more than half a million spells included in our sample, less than ten thousand (about 1.64%)

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, in all cases lower than for Latin America.

4. Methodology

4.1 Empirical strategy

We follow BMN's methodology and run a random effects logit³ for the probability of trade ceasing, and a fixed effects panel regression for the growth and initial value of exports. In all our regressions, we consider only the founders of the Latin American Integration Association (LAIA): Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru, Uruguay and Venezuela.

4.1.1. Random Effects Logit

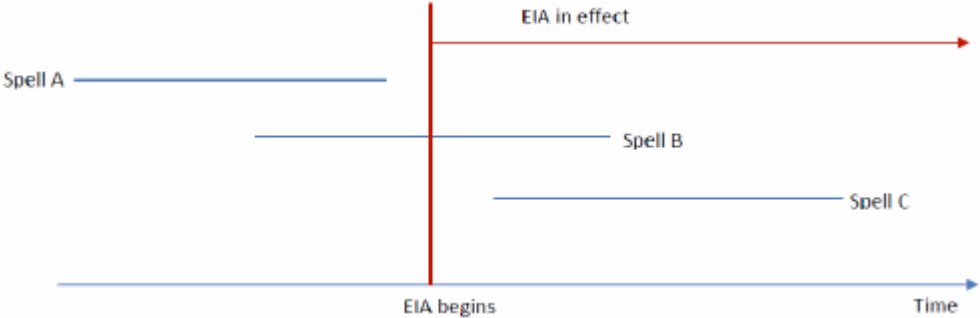
We are mainly interested in the effects of an EIA on the hazard of trade ceasing. Figure 2 reproduces Figure 2 of BMN, in which three kinds of spells are differentiated. Spells such as spell A start and end before the agreement goes into effect; spells such as spell B start before the agreement takes 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.

To capture the different effects an EIA may have on trade hazard, we follow BMN and construct three dummy variables. The first of them, 'EIA exists' identifies all pairs of countries which have ever had an agreement, whether it has already taken place or not.

³Besedes 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.

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.

Figure 2: Kinds of Spells



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 spells of the kind of A and of B, but not between B and C. The third dummy variable is called ‘Spell starts after EIA’ and identifies those spells that started after the agreement has taken place, thus differentiating spells of the kind of B and of C.

The definition of what constitutes an EIA is no trivial matter 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 usual literature. However, we consider that this kind of agreement does not entail serious integration intentions, and thus their characteristics may be different from those of the deeper agreements signed since the 90s. Moreover, as all Latin American countries are recipients of these benefits, they do not

allow us to distinguish them from the Free Trade Agreements signed afterwards. Hence, we construct 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 as a Preferential Trade Agreement by WTO or as a Free Trade Agreement, respectively⁴. 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.

We run a random effects logit using as explanatory variables those considered in the literature of duration of trade: the current length of the spell at every point in time, the initial volume of exports, GDP of the exporter and the importer, distance, common border, and common language, as in Besedes (2008) and Fugazza and Molina (2011).

We consider four specifications to measure the effects of trade integration. The first one adds to the standard variables the dummies 'EIA exists' and 'EIA in effect'. The second specification includes the additional dummy 'Spell starts after EIA'; the third specification adds a fourth variable which measures how long an agreement has been in place. This variable allows us to identify if the effect of an agreement depends of how long it has been in place, either diminishing in time as its effect dilutes, or increasing as its effects consolidate through time.

⁴Baier and Bergstrand (2013) also consider Customs Unions, Common Markets and Economic Unions; we do not include them as a separate threshold as they are scarce or they do not exist in Latin America.

In the last specification we explore a feature that could distinguish LA countries from the rest of the world: the (low) quality of their institutions, including their trade agreements. Many attempts of promoting economic integration have failed through time, among which we can mention LAIA, the ANDEAN community, and now possibly MERCOSUR (Peña, 2016). However, the usual measures of the depth of an EIA do not consider how many of its provisions are really enforceable, and not only expressions of desire. Therefore, we include in our fourth specification the variable constructed by Kohl et al. (2016) which measures the quality of trade integration agreements, in addition to the three dummy variables that we have considered. We expect the sign of this variable to be negative, as higher quality of trade agreements should promote the survival of trade relationships, but we have no *a priori* hypothesis on how its effects vary across spells of the type A, B or C. We run each specification three times, once for each minimum level of integration considered.

4.1.2 Fixed effects panel regression

We run a panel regression for the growth and initial volume of exports, including country pair, time, and 3-digit SITC code fixed effects. We define export growth as:

$$X Growth_t = \frac{export_t - export_{t-1}}{export_{t-1}}$$

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

4.2 Data sources

We analyze exports from the eleven founding LAIA countries – Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru and Venezuela – to 157 countries for the period 1962-2009. Trade data were obtained from WITS, and are classified according to 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. (2011) and is available at www.nd.edu/~jbergstr/.

Exporter and importer GDPs are 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. We utilize the trade agreements quality index constructed by Kohl et al. (2016) which measures trade agreements heterogeneity, and 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. We use the simple average of the indexes of Coverage, Index(C), and of Enforceability, Index(E). If a pair of countries has entered into more than one agreement⁵ we consider that with the greatest resulting value.

5. Results

Following BMN, we first examine the effects of EIA's on the hazard of trade ceasing. Afterwards, we analyze its impact on the growth of the volume of trade 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.

⁵For 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.

5.1 Hazard

We estimate the hazard of trade ceasing 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 of the standard variables have the expected signs and magnitudes are similar to those found by BMN; these results do not vary across different definitions of EIA. However, the similarities are more nuanced when comparing the impact of the EIA dummies. 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 in 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 consider only agreements that are FTAs or deeper, the coefficient has a negative sign, and is highly

significant. This effect 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 of hazard, and the signing of a shallow EIA has no additional effect. However, when the EIA is deep enough, the final effect is to reduce the overall hazard of exports.

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 raise the risk for the spells that already existed: the exact opposite 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 as those that come afterwards. Comparing to our previous specification, we find 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 the time in years since the signing of the EIA, the effects once again differ with those for the whole world and across levels of trade agreements. Whereas for the whole world the hazard increases as more time

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*** -207.96	-0.595*** -207.50	-0.549*** -179.40	-0.548*** -178.84	-0.591*** -208.03	-0.594*** -207.66	-0.567*** -191.04	-0.561*** -189.32	-0.569*** -197.06	-0.574*** -195.66	-0.566*** -190.31	-0.564*** -188.79
Initial Exports (ln)	-0.114*** -107.11	-0.114*** -106.83	-0.119*** -109.04	-0.119*** -109.5	-0.113*** -106.34	-0.113*** -106.32	-0.116*** -107.32	-0.118*** -108.67	-0.118*** -108.80	-0.118*** -109.02	-0.119*** -109.35	-0.119*** -109.34
Exporter GDP (ln)	-0.258*** -115.52	-0.259*** -115.58	-0.256*** -112.60	-0.250*** -109.66	-0.249*** -111.20	-0.251*** -111.48	-0.250*** -110.3	-0.246*** -108.28	-0.247*** -109.87	-0.248*** -109.89	-0.248*** -109.98	-0.247*** -109.08
Importer GDP (ln)	-0.081*** -51.50	-0.080*** -50.61	-0.073*** -44.78	-0.075*** -45.7	-0.094*** -64.58	-0.093*** -64.33	-0.088*** -59.96	-0.086*** -58	-0.089*** -60.53	-0.089*** -60.23	-0.089*** -59.99	-0.088*** -59.6
Distance (ln)	0.257*** 46.49	0.257*** 46.47	0.258*** 45.43	0.252*** 44.09	0.254*** 45.66	0.253*** 45.52	0.257*** 45.33	0.257*** 45.04	0.250*** 44.47	0.248*** 44.17	0.244*** 43.35	0.244*** 43.13
Adjacency	-0.029*** -2.77	-0.021** -2.04	0.018* 1.68	0.037*** 3.42	-0.003 -0.29	0.012 1.12	0.057*** 5.17	0.042*** 3.8	0.039*** 3.51	0.039*** 3.53	0.044*** 3.94	0.046*** 4.12
Common Language	-0.251*** -30.78	-0.249*** -30.48	-0.222*** -26.38	-0.207*** -24.43	-0.215*** -25.54	-0.208*** -24.56	-0.166*** -19.15	-0.189*** -21.52	-0.207*** -24.59	-0.206*** -20.14	-0.206*** -24.38	-0.203*** -23.93
EIA Exists	-0.190*** -18.81	-0.183*** -18.04	-0.160*** -15.45	-0.153*** -14.75	-0.164*** -18.69	-0.156*** -17.72	-0.142*** -15.89	-0.129*** -14.29	-0.117*** -15.68	-0.116*** -15.47	-0.121*** -16.11	-0.095*** -12.19
EIA Is In Effect	0.007 0.81	0.101*** 7.78	0.107*** 8.20	0.131*** 10.01	-0.003 -0.34	0.095*** 7.04	0.099*** 7.30	0.335*** 21.71	-0.269*** -35.22	-0.207*** -20.14	-0.142*** -12.73	-0.067*** -5.28
Spell Starts After EIA		-0.112*** -9.95	0.106*** 8.59	0.072*** 5.75		-0.131*** -9.77	0.109*** 7.35	-0.024 -1.55		-0.112*** -8.91	-0.024* -1.74	-0.018 -1.26
Years Since EIA			-0.012*** -44.59	-0.010*** -33.71			-0.012*** -37.43	-0.009*** -27.55			-0.022*** -14.25	-0.023*** -14.59
Quality of the Agreement				-0.292*** -21.38				-0.527*** -32.14				-0.212*** -12.1
Constant	6.610*** 77.65	6.591*** 77.35	6.297*** 72.48	6.255*** 71.89	6.635*** 78.09	6.664*** 78.34	6.479*** 75.19	6.318*** 73.03	6.504*** 75.83	6.519*** 78.92	6.559*** 76.22	6.516*** 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

elapses since the signing of an EIA, for Latin America the opposite is true. 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, the hazard is steadily reduced. The same happens for deeper EIAs, although the initial effect is a reduction of risk for all spells, both those that start after the signing as those that had started before. Contrarily to BMN, agreements in Latin America become more effective the older they are, and this effect doubles for Free Trade Agreements; this may suggest that their implementation and enforcement is an important issue, and they need time to achieve its full effect.

Finally, specification 4 incorporates the quality of a trade agreement, 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. Adding this variable distinctly reduces the coefficient of “EIA exists”, suggesting that the effect of an EIA depends on its quality. This result is particularly relevant for Latin America, in which economic integration agreements abound (there are two customs unions in effect – MERCOSUR and Andean), but their quality is particularly low.

5.2 Trade Growth

We estimate the effects of EIAs on Trade Growth by running a fixed effects panel regression on the Growth of Exports. The standard variables – spell duration, initial exports, exporter’s GDP and importer’s GDP, distance, common language and adjacency –

are all significant, have the expected signs and their coefficients don't vary much across specifications and definitions of EIA.

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 those 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, although it is non-significant for some specification 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 seem 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 a trade agreement has a positive effect on 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.

5.3 Initial Volume of Trade

Finally, we run a fixed effect panel regression on the Initial Volume of trade. The usual variables have the expected sign: exporter's and importer's GDP and adjacency have a

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 Duration (ln)	-0.281*** -11.521	-0.281*** -11.521	-0.278*** -11.399	-0.279*** -11.445	-0.282*** -11.571	-0.282*** -11.584	-0.282*** -11.584	-0.282*** -11.566	-0.280*** -11.503	-0.280*** -11.503	-0.277*** -11.368	-0.277*** -11.354
Initial Exports (ln)	-0.037*** -64.176	-0.037*** -64.037	-0.037*** -64.044	-0.037*** -64.125	-0.037*** -64.335	-0.037*** -64.333	-0.037*** -64.331	-0.037*** -64.350	-0.037*** -64.075	-0.037*** -63.956	-0.037*** -63.773	-0.037*** -63.815
Exporter GDP (ln)	0.016*** 23.733	0.016*** 23.734	0.016*** 23.767	0.016*** 23.974	0.016*** 25.783	0.016*** 25.783	0.016*** 25.756	0.016*** 25.784	0.016*** 25.508	0.016*** 25.475	0.016*** 25.543	0.016*** 25.388
Importer GDP (ln)	0.011*** 9.833	0.011*** 9.735	0.010*** 9.539	0.010*** 8.791	0.009*** 8.335	0.009*** 8.340	0.009*** 8.337	0.009*** 8.309	0.010*** 8.902	0.010*** 8.899	0.009*** 8.845	0.009*** 8.728
Distance (ln)	0.004* 1.726	0.004* 1.732	0.004* 1.751	0.006*** 2.660	0.008*** 3.359	0.008*** 3.353	0.008*** 3.347	0.007*** 3.226	0.006*** 2.738	0.006*** 2.735	0.006** 2.412	0.006** 2.500
Adjacency	0.016*** 4.206	0.017*** 4.218	0.018*** 4.497	0.014*** 3.522	0.006 1.468	0.005 1.338	0.005 1.319	0.006 1.437	0.010** 2.379	0.010** 2.379	0.010** 2.499	0.010** 2.409
Common Language	0.014*** 4.095	0.014*** 4.079	0.014*** 4.134	0.013*** 3.921	0.005 1.519	0.005 1.480	0.005 1.466	0.005 1.296	0.010*** 3.030	0.010*** 3.029	0.010*** 2.977	0.011*** 3.051
EIA Exists	-0.010 -1.557	-0.009 -1.524	-0.007 -1.181	-0.011* -1.722	0.013*** 3.123	0.013*** 3.128	0.013*** 3.107	0.014*** 3.299	0.017*** 4.853	0.017*** 4.850	0.017*** 4.830	0.013*** 3.584
EIA Is In Effect	0.017*** 2.954	0.018*** 2.767	0.019*** 2.971	0.015** 2.329	0.022*** 5.109	0.020*** 3.683	0.020*** 3.678	0.026*** 3.841	0.006* 1.667	0.006 1.564	0.015*** 3.066	0.007 1.226
Spell Starts After EIA		-0.002 -0.373	0.004 0.869	0.007 1.457		0.003 0.578	0.002 0.331	-0.001 -0.136		- 0.029	0.007 1.187	0.008 1.232
Years Since EIA			-0.000** -2.116	-0.000*** -2.941			0.000 0.114	0.000 0.187			-0.002*** -3.170	-0.002*** -3.208
Quality of the Agreement				0.038*** 6.538				-0.012 -1.430				0.025*** 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

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*** 71.160	0.148*** 70.216	0.147*** 69.858	0.124*** 65.554	0.130*** 68.381	0.131*** 68.692	0.127*** 66.706	0.128*** 67.128	0.128*** 67.095
Exporter GDP (ln)	0.106*** 36.246	0.107*** 36.456	0.108*** 36.655	0.111*** 37.410	0.107*** 36.072	0.107*** 36.094	0.109*** 36.901	0.107*** 36.375	0.107*** 36.367
Distance (ln)	-0.053*** -7.048	-0.051*** -6.729	-0.053*** -6.958	-0.030*** -3.974	-0.037*** -4.877	-0.038*** -4.997	-0.041*** -5.392	-0.049*** -6.432	-0.049*** -6.399
Adjacency	0.115*** 7.870	0.104*** 7.081	0.111*** 7.493	0.081*** 5.351	0.149*** 9.749	0.142*** 9.259	0.120*** 7.839	0.127*** 8.298	0.127*** 8.275
Common Language	-0.149*** -13.369	-0.152*** -13.592	-0.147*** -13.11	-0.165*** -14.218	-0.119*** -10.109	-0.129*** -10.977	-0.150*** -13.116	-0.148*** -12.936	-0.148*** -12.958
EIA Exists	-0.370*** -26.911	-0.390*** -27.418	-0.384*** -26.878	-0.139*** -11.756	-0.094*** -7.919	-0.082*** -6.866	-0.021** -2.005	-0.022** -2.140	-0.025** -2.338
EIA Is In Effect	0.100*** 8.226	0.076*** 5.869	0.075*** 5.799	0.113*** 9.081	0.287*** 20.899	0.345*** 23.316	-0.198*** -17.149	-0.033** -2.197	-0.042** -2.398
Years Since EIA		0.002*** 5.476	0.003*** 6.36		-0.013*** -30.051	-0.012*** -28.201		-0.036*** -16.980	-0.035*** -16.889
Quality of the Agreement			-0.088*** -4.615			-0.238*** -10.501			0.025 1.002
Constant	-4.810*** -35.802	-4.833*** -35.955	-4.821*** -35.862	-4.645*** -34.480	-4.612*** -34.237	-4.605*** -34.196	-4.522*** -33.563	-4.399*** -32.602	-4.401*** -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

positive effect, distance a negative one. Contrary to what was expected, 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, which implies that countries that have at some point of the sample signed an integration agreement usually have lower initial volumes of trade. The variable 'EIA is in effect', conversely, varies depending on the depth of integration considered. For shallower EIAs, they increase the initial volumes of trade, whereas they decrease them for deeper ones. Something similar occurs with the time elapsed since EIAs are signed: it has a positive sign for EIAs ≥ 1 , and a negative when only the deeper agreements are considered. Finally, the quality of the trade agreements reduces the initial volumes of trade for shallower EIAs, while it has a nil effect for FTAs.

6. Conclusions

In this paper we have applied Besedes et al. (2015) 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 hold when examining the Latin American experience, as several of their dummy variables reverse their signs. We have also found that for this region the effects on trade depend heavily on the depth of the agreements considered. These results should warn us against conducting worldwide analyses, as regional differences may be lost when aggregating, especially in regions with a smaller number of spells. Our empirical analysis allows us to conclude that:

a) Economic Integration Agreements have a positive effect on the survival rate of trade; however this effect is lower for deeper trade agreements. This implies that countries which have signed an EIA face a lower risk than those that have not.

b) For those spells that started before the agreement but did not end until after the agreement has begun, the effect depends on the depth of the agreement: only agreements that are FTAs or deeper have a significant positive effect.

c) Spells that started after an EIA has been signed face a lower risk of trade ceasing, however the magnitude of this significant effect depends on the depth of the integration agreement.

d) 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.

e) Regarding the effect of the quality of trade agreements we found that higher quality agreements lead to higher increases on the survival rate of trade relationships.

f) 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, although, this effect decreases with time.

g) Finally, when evaluating the effect on the initial volume of trade, we found that countries that have signed an integration agreement usually have lower initial volumes of

trade. However, for spells that started before the agreement but did not end until after the agreement has begun, the effect depends on the depth of integration considered: for shallower ones the effect is positive whereas for deeper EIAs it is negative.

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Appendix

Table A.1.
List of Latin American Economic Integration Agreements

EIA 1: Non Reciprocal Preferential Trade Agreements (NRPTA)

- European Union GSP⁶ (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 – CARICOM⁷ (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.

⁶Generalized system of preferences.

⁷Conformed 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.

- 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)
- Mexico – Israel (2000)
- Mexico – EFTA⁸ (2001)
- Mexico – Northern Triangle⁹ (2001)
- Chile – Central America¹⁰ (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)

⁸Conformed by Iceland, Liechtenstein, Norway and Switzerland.

⁹Conformed by El Salvador, Guatemala and Honduras.

¹⁰Conformed by Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua.