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Border Effect in Interregional Iberian Trade[1]

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Abstract

Regardless of their formal existence, borders do have an effect of diminishing trade. The reduction that the existence of a border causes on potential trade flows is classified as "border effect". The present paper provides an estimation of such effect on the Portugal –Spain border.

For this, interregional trade relations are considered. All 20 peninsular NUTII regions are concerned. Data used are the interregional Iberian trade matrices provided in Ferreira (2008).

A model for these flows is conducted using, among several other explaining factors, the existence of a national border between regions. Thus the border effect is predicted. On this paper we provide an estimation of border effects by economic sectors, showing that different industries experience in different manners the consequences of borders.

Keywords: border effect, interregional trade, Portugal, Spain

Introduction

Borders have a diminishing effect on trade flows. Even when they do not represent a formal, administrative or fiscal barrier, as in the case of the actual Portugal-Spain border, cultural aspects, fear from the unknown, trading traditions and lack of business networks are some of the factors which lead potential business between actors on different sides of the border not to occur. This decrease in potential trade flows is known as *border effect.* In this paper we aim at estimating this effect on

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interregional trade flows within Portugal and Spain. These effects are computed with a sector classification trying to identify which are the economic sectors more and less affected by the border.

Literature Overview

On the specific subject discussed in the present paper, the border effect on interregional trade flows within the Iberian Peninsula, there is hardly any literature produced. However two interesting sets of literature on two related subjects: border effect in general and trade relations Portugal-Spain.

Regarding border effect, this can be defined as the reduction in trade flows caused by the existence of a national border between two trading regions. One is normally tempted to associate this effect with tariffs and other types of fiscal or administrative barriers to trade. The fact is that even in cases where the border represents no formal barrier to trade, for example within the European Single Market, there is this reduction. This subject has been systematically approached in the end of the twentieth century, when studying the Canadian – USA border, for example in McCallum (1995), Helliwell (1996) and Anderson and Smith (1999a and 1999b). As for the Portuguese and Spanish cases very little has been written on. Gil-Pareja *et al* (2006) presented an interesting research on the Spanish case, focusing in particular the trade of the *Pais Vasco* region. The model we present in the present case follows closely the model carried out in that research. A similar approach was also present by ESTG (2008), this one for the specific case of the interregional trade flows in Portugal and Spain. The present paper is a completion of the one presented in that report introducing, and centring the discussion on the different border effects for different economic sectors.

One of the main problems in discussing this subject is the lack of data available on interregional trade flows for these two countries. A set of estimations exists on the interregional trade in Spain alone, produced by Llano Verduras, having the first of these estimations being published in Llano Verduras (2001). As for data considering both Portuguese and Spanish regions simultaneously we only have knowledge on the estimations presented in Ferreira (2008), which we used to run our model.

The case of trade between Portugal and Spain is an interesting subject to study, due to its historic characteristic. These are very proximate countries, not only geographically, but also culturally, historically and economically. Given so, these should be preferential trading partners. However both have focused their development strategy overseas, somehow neglecting the potential development on the border between them. Only in the end of the twentieth century both simultaneously changed their strategies towards Europe and suddenly both were part of European Single Market. The potential for a fast increase in trade has been analysed and such increase measured by several authors, namely Caetano (1998), Caetano and Ferreira (1999), Lopez Martinez (2003), and several others.

Methodology

Aiming at measuring the border effect in the interregional trade within the Iberian Peninsula, we centred our methodology in designing a model to estimate interregional trade flows. We considered these flows as dependent of the size of the regions, measured by their GDP, the distance between regions, the existence or not of a national border between them and the contiguity between regions. From these models, the coefficients for the national border variable will provide us a good estimation for the border effect. These will show how much trade between two regions has increased by the simple fact they are a part of the same country.

The biggest problem with this approach is the availability of trade flows figures. The model is an attempt to explain existing trade flows, thus availability of such figures is essential to run it. However, no official data exist on interregional trade within the Iberian Peninsula. For this reason so little is known about this reality. The only existing set of data on these relations, as far as we know, is a database of matrices Origin/Destiny from an estimation published in Ferreira (2008). These data are available for the period from 1990 to 2000, being the last year quite incomplete. Thus our model was run considering only the year 1999 which is the most recent one for which interregional trade flows estimations exist.

As for sector classification these figures are available classified in eleven different sectors. This is a mixture of two different classification tables used to produce those estimations, due to the use of two different sources of primary data, international trade statistics and transport statistics[2]. The sector classification is thus the one presented in table 1.

[2] For further information on this procedure please refer to chapter 4 in Ferreira (2008)

Table nr.1. Sector classification

S1	Animals and Vegetables	S7	Cellulose
S2	Food products	S8	Chemicals
S3	Wood, cork and coal	S9	Glass and ceramics
S4	Textiles and clothes	S10	Vehicles and machines
S5	Minerals and fuels	S11	Others
S6	Metals	ST	Total trade

Source: Ferreira (2008)

A similar analysis to this reality was already provided in ESTG (2008). However in that report only total trade is considered, not providing a differentiation among sectors. Therefore we choose to maintain the model as closed as possible to the one used then. Also this is consistent with the types of model tested and presented in the literature discussed above, namely in Gil-Pareja *et al* (2006).

Our model is thus based on a multiple linear regression of the logs of the considered variables. It is presented in equation one:

$$\ln X_{od} = \beta_0 + \beta_1 \ln PIB_o + \beta_2 \ln PIB_d + \beta_3 \ln dist_{od} + \beta_4 Nac + \beta_5 Cont. + \mu_{od} \quad (1)$$

The used variables are the following.

X_{od} – Corresponds to the existing trade between a pair of regions *od* measured in monetary values. O stands for origin and D stands for destiny. Thus trade between two specific regions (say Alentejo and Andaluzia) corresponds to two different values $X_{\text{Alentejo-Andaluzia}}$ and $X_{\text{Andaluzia-Alentejo}}$.

PIB_o – Corresponds to the value of Gross Domestic Product of the region where the trade is originated for each flow. These two variables (including PIB_d) aim at measuring the size of the regions involved in trade, naturally assuming that bigger regions tend to have bigger trade figures. A positive coefficient is thus predicted for this variable.

PIB_d – Similarly to the previous one, measures the GDP of the region destination, the one for which a certain trade flow is sent. Also positive coefficients are expected here because the bigger the region is the more it is expected to trade.

$DIST_{od}$ – Measures the distance between regions origin and destiny, in kilometers. These distances are not the linear distance between the geographical centers of the regions. Instead they are the length of the recommended itineraries provided by a road maps provider between cities. The concept underlying is that most trade is originated by the biggest urban centers instead of a geo center. For each region the main city was identified and used to estimate distances to other regions. In a few cases a pair of cities was used to represent a certain region. In such case the distance to another region is the average of the distances between each of these two cities and the other region. Negative coefficients are expected to these variables, since the greater the distance is, the more expensive and difficult it becomes to establish business relations.

NAC – This is our main variable. Nationality is a *dummy* variable which identifies if two regions *o* and *d* have the same nationality. It assumes the value 1 for each pair of regions from the same country and the value 0 for regions with a national border in between. From this variable we will produce our estimations of the border effect. Being positive for non-crossing border trade, it is expected to present a significantly positive coefficient. Its slope will provide a estimation on how much trade increases for not having a border, *i.e.*, the border effect.

CONT – This variable is measuring contiguity between regions. Again this is a *dummy* variable. It presents the value 1 for each pair of regions which are contiguous, *i.e.*, it is possible to travel by land from one to the other without having to pass by any other region. We believe that there may be some correlation problems between this variable and DIST, two contiguous regions tend to be more proximate than two non-contiguous ones (though not necessarily because distance is based on main cities and not on borders. For example distance between Algarve and contiguous Andaluzia is 326km, while distance between Algarve and non contiguous Lisboa is 292km). Nevertheless we choose to keep it in our original model because it may identify different realities which may influence trade but are not measured solely by distance, for example culture proximity, business networks integration, etc. Positive coefficients are also expected for this variable because contiguity is supposed to have an increasing effect on trade flows.

This model was run for each of the eleven sectors, plus for the total trade values. For each of these 380 observations were used, corresponding to 20 regions times 19 trade partner regions. Software used was SPSS ver. 17.

Results

Having run our models, as described above we found most satisfactory results. Coefficients have the expected signs and most estimated equations and variables are statistically significant.

Table 2 presents the basic measures of the adequacy of each sector estimation and table 3 presents the principal results obtained:

Table nr. 2. Model 1 - statistics

		R^2	F	Sig
S1	Animals and Vegetables	0,733	205,397	0,000
S2	Food products	0,823	348,364	0,000
S3	Wood, cork and coal	0,615	119,615	0,000
S4	Textiles and clothes	0,86	458,321	0,000
S5	Minerals and fuels	0,733	205,142	0,000
S6	Metals	0,659	144,8	0,000
S7	Cellulose	0,456	62,824	0,000
S8	Chemicals	0,661	145,739	0,000
S9	Glass and ceramics	0,538	87,22	0,000
S10	Vehicles and machines	0,727	198,97	0,000
S11	Others	0,825	353,189	0,000
ST	Total trade	0,907	733,611	0,000

Table nr. 3. Model 1 – results

		Coefficients			**95,0% Confidence Interval for B**	
Sector	**Variable**	**B**	**t**	**Sig.**	**Lower Bound**	**Upper Bound**
S1 Animals and Vegetables	(Constant)	-2,649	-2,176	0,03	-5,043	-0,255
	GDP Origin region	0,781	13,332	0	0,666	0,896
	GDP Destination region	0,871	14,862	0	0,755	0,986
	Log Distance	-0,931	-6,086	0	-1,231	-0,63
	Common Nationality	1,581	12,666	0	1,336	1,827
	Contiguous Regions	1,015	5,395	0	0,645	1,385
S2 Food Products	(Constant)	-4,724	-3,289	0,001	-7,549	-1,9
	GDP Origin region	0,96	13,889	0	0,824	1,096
	GDP Destination region	0,962	13,916	0	0,826	1,098
	Log Distance	-1,189	-6,588	0	-1,544	-0,834
	Common Nationality	3,755	25,488	0	3,465	4,044
	Contiguous Regions	0	2,726	0,007	0,169	1,042

		Coefficients			95,0% Confidence Interval for B	
Sector	**Variable**	**B**	**t**	**Sig.**	**Lower Bound**	**Upper Bound**
S3 Wood, Cork and Coal	(Constant)	-6,773	-3,508	0,001	-10,57	-2,976
	GDP Origin region	0,705	7,586	0	0,522	0,888
	GDP Destination region	1,199	12,906	0	1,017	1,382
	Log Distance	-0,993	-4,094	0	-1,47	-0,516
	Common Nationality	2,166	10,937	0	1,776	2,555
	Contiguous Regions	0	3,62	0	0,494	1,668
S4 Textiles and Clothes	(Constant)	-7,848	-5,284	0	-10,769	-4,927
	GDP Origin region	1,145	16,02	0	1,005	1,286
	GDP Destination region	1,231	17,228	0	1,091	1,372
	Log Distance	-1,366	-7,321	0	-1,733	-0,999
	Common Nationality	4,678	30,714	0	4,379	4,978
	Contiguous Regions	0	-0,259	0,795	-0,511	0,392
S5 Minerals and Fuels	(Constant)	2,489	1,58	0,115	-0,608	5,586
	GDP Origin region	0,944	12,455	0	0,795	1,093
	GDP Destination region	0,728	9,608	0	0,579	0,877
	Log Distance	-2,038	-10,301	0	-2,427	-1,649
	Common Nationality	2,429	15,041	0	2,112	2,747
	Contiguous Regions	1952,193	0,453	0,651	-0,368	0,589
S6 Metals	(Constant)	-7,873	-4,314	0	-11,462	-4,284
	GDP Origin region	1,375	15,651	0	1,202	1,547
	GDP Destination region	1,108	12,621	0	0,936	1,281
	Log Distance	-1,476	-6,437	0	-1,927	-1,025
	Common Nationality	1,865	9,964	0	1,497	2,233
	Contiguous Regions	0	-0,102	0,919	-0,584	0,526
S7 Cellulose	(Constant)	-23,566	-7,963	0	-29,386	-17,747
	GDP Origin region	2,079	14,595	0	1,799	2,359
	GDP Destination region	1,538	10,798	0	1,258	1,818
	Log Distance	-1,058	-2,846	0,005	-1,789	-0,327
	Common Nationality	-1,067	-3,516	0	-1,664	-0,47
	Contiguous Regions	2,08	0,114	0,909	-0,847	0,952
S8 Chemicals	(Constant)	-7,796	-4,826	0	-10,973	-4,62
	GDP Origin region	1,182	15,206	0	1,029	1,335
	GDP Destination region	1,106	14,225	0	0,953	1,259
	Log Distance	-1,144	-5,639	0	-1,543	-0,745
	Common Nationality	1,471	8,879	0	1,145	1,797
	Contiguous Regions	0	1,579	0,115	-0,097	0,885
S9 Glass and Ceramics	(Constant)	-10,889	-5,447	0	-14,82	-6,958
	GDP Origin region	1,559	16,207	0	1,37	1,748
	GDP Destination region	0,871	9,054	0	0,682	1,06
	Log Distance	-1,08	-4,299	0	-1,573	-0,586

		Coefficients			95,0% Confidence Interval for B	
Sector	**Variable**	**B**	**t**	**Sig.**	**Lower Bound**	**Upper Bound**
	Common Nationality	0,771	3,761	0	0,368	1,174
	Contiguous Regions	0	0,813	0,417	-0,356	0,859
S10 Vehicles and Machines	(Constant)	-9,782	-5,428	0	-13,326	-6,239
	GDP Origin region	1,611	18,576	0	1,441	1,782
	GDP Destination region	1,337	15,411	0	1,166	1,507
	Log Distance	-1,789	-7,902	0	-2,234	-1,344
	Common Nationality	1,97	10,659	0	1,606	2,333
	Contiguous Regions	0	-0,038	0,969	-0,558	0,537
S11 Others	(Constant)	-9,642	-6,027	0	-12,789	-6,496
	GDP Origin region	1,5	19,479	0	1,348	1,651
	GDP Destination region	1,169	15,184	0	1,018	1,321
	Log Distance	-1,612	-8,022	0	-2,008	-1,217
	Common Nationality	3,855	23,493	0	3,532	4,177
	Contiguous Regions	0	-0,898	0,37	-0,709	0,264
Total Trade	(Constant)	-1,833	-2,151	0,032	-3,509	-0,158
	GDP Origin region	1,075	26,225	0	0,995	1,156
	GDP Destination region	1,072	26,133	0	0,991	1,152
	Log Distance	-1,458	-13,618	0	-1,668	-1,247
	Common Nationality	2,619	29,971	0	2,447	2,791
	Contiguous Regions	0	0,611	0,542	-0,179	0,339

From table 2 we observe the consistency of most models at high level of significance. However, in terms of R^2 we conclude that some of these estimations explain only a small part of the differences in trade flows. If our goal would be to estimate trade flows we would have only a poor estimation for some of the sectors. The estimation for sector 7 is the less representative.

From table 3 we underline two immediate conclusions. The first is the consistency of the coefficient signals with the predicted ones, for most cases. The second one is that most variables in all models are statistically significant, except for the case of the variable *Contiguous Regions*. This one is clearly not significant for most of the estimations conducted.

Given this observation a second version of the model was run excluding the variable CONT. This is presented in equation 2:

$$\ln X_{od} = \beta_0 + \beta_1 \ln PIB_o + \beta_2 \ln PIB_d + \beta_3 \ln dist_{od} + \beta_4 Nac + \mu_{od} \qquad (2)$$

The results obtained from this new version of the model do not vary significantly from the previous one. But this one allows us to exclude any potential problems derived from correlation between DIST and CONT.

In tables 4 and 5 we present the main results for these estimations for each of the sectors:

Table nr. 4. Model 2 - statistics

		R^2	**F**	**Sig**
S1	Animals and Vegetables	0,712	232,076	0,000
S2	Food products	0,82	426,29	0,000
S3	Wood, cork and coal	0,602	141,67	0,000
S4	Textiles and clothes	0,86	574,313	0,000
S5	Minerals and fuels	0,733	256,921	0,000
S6	Metals	0,659	181,476	0,000
S7	Cellulose	0,456	78,734	0,000
S8	Chemicals	0,659	180,831	0,000
S9	Glass and ceramics	0,538	108,958	0,000
S10	Vehicles and machines	0,727	249,376	0,000
S11	Others	0,825	441,512	0,000
ST	Total trade	0,907	918,455	0,000

Table nr. 5. Model 2 – results

		Coefficients			**95,0% Confidence Interval for B**	
Sector	**Variable**	**B**	**t**	**Sig.**	**Lower Bound**	**Upper Bound**
S1 Animals and Vegetables	(Constant)	0,675	0,62	0,536	-1,465	2,815
	GDP Origin region	0,803	13,254	0	0,684	0,922
	GDP Destination region	0,893	14,731	0	0,773	1,012
	Log Distance	-1,492	-12,831	0	-1,72	-1,263
	Common Nationality	1,519	11,784	0	1,265	1,772
S2 Food Products	(Constant)	-2,742	-2,195	0,029	-5,199	-0,286
	GDP Origin region	0,973	13,993	0	0,837	1,11
	GDP Destination region	0,975	14,019	0	0,838	1,112
	Log Distance	-1,523	-11,415	0	-1,786	-1,261
	Common Nationality	3,717	25,129	0	3,426	4,008

S3 Wood, Cork and Coal	(Constant)	-3,235	-1,912	0,057	-6,562	0,092
	GDP Origin region	0,728	7,733	0	0,543	0,914
	GDP Destination region	1,223	12,981	0	1,037	1,408
	Log Distance	-1,59	-8,8	0	-1,946	-1,235
	Common Nationality	2,099	10,479	0	1,705	2,493
S4 Textiles and Clothes	(Constant)	-8,043	-6,286	0	-10,559	-5,527
	GDP Origin region	1,144	16,061	0	1,004	1,284
	GDP Destination region	1,23	17,273	0	1,09	1,37
	Log Distance	-1,333	-9,756	0	-1,602	-1,064
	Common Nationality	4,682	30,911	0	4,384	4,98
S5 Minerals and Fuels	(Constant)	2,85	2,1	0,036	0,182	5,518
	GDP Origin region	0,946	12,53	0	0,798	1,095
	GDP Destination region	0,731	9,673	0	0,582	0,879
	Log Distance	-2,099	-14,484	0	-2,384	-1,814
	Common Nationality	2,423	15,081	0	2,107	2,738
S6 Metals	(Constant)	-7,968	-5,069	0	-11,059	-4,877
	GDP Origin region	1,374	15,703	0	1,202	1,546
	GDP Destination region	1,108	12,661	0	0,936	1,28
	Log Distance	-1,46	-8,696	0	-1,79	-1,13
	Common Nationality	1,867	10,031	0	1,501	2,233
S7 Cellulose	(Constant)	-23,395	-9,178	0	-28,407	-18,383
	GDP Origin region	2,08	14,658	0	1,801	2,359
	GDP Destination region	1,539	10,847	0	1,26	1,818
	Log Distance	-1,087	-3,992	0	-1,622	-0,552
	Common Nationality	-1,07	-3,547	0	-1,664	-0,477
S8 Chemicals	(Constant)	-6,505	-4,659	0	-9,251	-3,76
	GDP Origin region	1,191	15,323	0	1,038	1,344
	GDP Destination region	1,115	14,341	0	0,962	1,267
	Log Distance	-1,362	-9,136	0	-1,655	-1,069
	Common Nationality	1,447	8,753	0	1,122	1,772
S9 Glass and Ceramics	(Constant)	-10,067	-5,841	0	-13,455	-6,678
	GDP Origin region	1,565	16,31	0	1,376	1,753
	GDP Destination region	0,876	9,136	0	0,688	1,065
	Log Distance	-1,219	-6,62	0	-1,58	-0,857
	Common Nationality	0,756	3,704	0	0,354	1,157

S10 Vehicles and Machines	(Constant)	-9,817	-6,325	0	-12,869	-6,765
	GDP Origin region	1,611	18,644	0	1,441	1,781
	GDP Destination region	1,336	15,466	0	1,166	1,506
	Log Distance	-1,783	-10,756	0	-2,109	-1,457
	Common Nationality	1,97	10,723	0	1,609	2,332
S11 Others	(Constant)	-10,37	-7,517	0	-13,083	-7,657
	GDP Origin region	1,495	19,468	0	1,344	1,646
	GDP Destination region	1,164	15,162	0	1,013	1,315
	Log Distance	-1,49	-10,11	0	-1,779	-1,2
	Common Nationality	3,868	23,686	0	3,547	4,19
Total Trade	(Constant)	-1,57	-2,138	0,033	-3,013	-0,126
	GDP Origin region	1,077	26,354	0	0,997	1,157
	GDP Destination region	1,073	26,26	0	0,993	1,154
	Log Distance	-1,502	-19,156	0	-1,656	-1,348
	Common Nationality	2,614	30,07	0	2,443	2,785

Comparing the results shown in table four with those above from table two we notice that the reduction in R^2 for the removal of variable CONT are minor and not significant. Thus we maintain the conclusion of the acceptance of the model.

From the comparison of the results shown in tables 3 and 5 we also notice the inexistence of significant changes from the two models. Thus we keep this model two as our final estimation for the present paper.

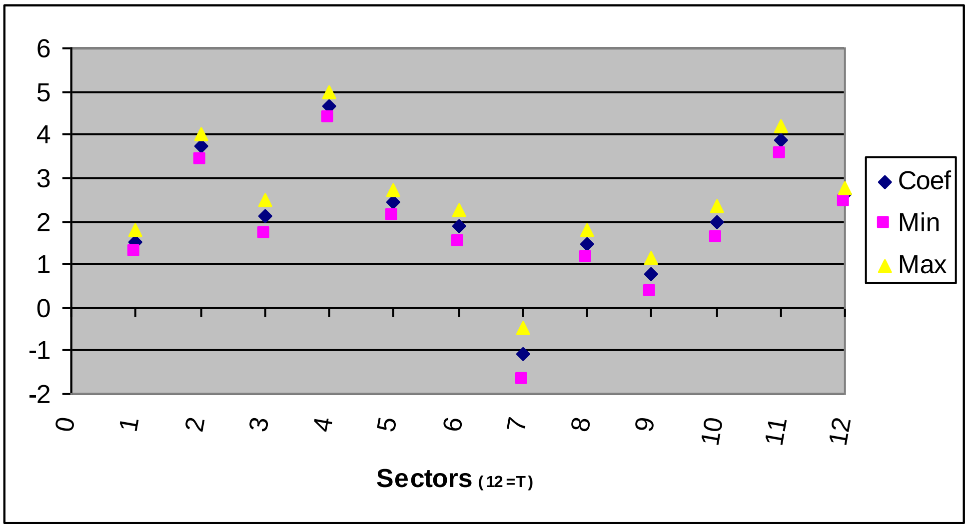
The only two variables we identify which are not significant at 5% are the constant for sectors 1 and 3. For these two models we can not conclude that the constant is significantly different of zero. We had two options for these two sectors: either maintain the model as it is, or to run other estimation only for these two sectors. Because the goal of this paper is to allow comparisons between sectors, we opted for maintain the model as it is, in order to keep an equal structure for all sectors.

From the coefficients analysis we firstly observe the coherence of its signals with the predicted ones. Curiously the only exception is exactly on the variable *Common Nationality*, for only sector 7. This leads us to a strange conclusion: there is border effect for all activity sectors, accordingly with theoretic prediction, *i.e.*, border is diminishing trade and tough in the case of celluloses the effect in contrary, border is increasing trade. Two possible explanations may be pointed out for this fact. The first is the low quality that this model has shown in the case of this sector, with a R^2 bellow 50% (the lowest obtained). This mere fact can lead to the conclusion of the lack of robustness of our estimations in the case of this sector. A second explanation may be on the nature of the sector itself. Being characterized mainly by a small number of big factories, trade flows within the sector tends to occur between major industrial areas, thus with a more significant role for international than interregional trade.

Considering the other exogenous variables we identify a full coherence of signs accordingly to predicted in the theory: GDPs for both origin and destiny regions have a positive effect on trade. Thus we confirm our expectations of greater trade levels between regions with either economic size. Also for distance we find that the estimated coefficients are consistent with the theory. All are negative demonstrating that a greater distance between two regions leads to a smaller value of trade flows.

But our main goal with this model is the difference in the border effect for the different activity sectors. We may observe that in fact these coefficients are clearly different between sectors. Those differences are observable in graph one, in which we present confidence intervals for coefficients for NAC variable, at 95%.

Graph 1 – Confidence intervals for NAC coefficients



Two of our main conclusions may be drawn from observing this graph along with table 5. There is a positive border effect for all economy sectors, except for 7, which we have commented above. The second one confirms our hypothesis: there are statistical significant differences on the diminishing effect that a national border causes on trade for each economy sector.

Looking at these differences we may now conclude which are the sectors more affected by the border. Clearly outcome the *Textiles*, the *Others* and the *Food Products*. On the other extreme *Glass*, *Chemicals* and *Metals* are the sectors were the border represents a lower barrier to trade. A possible explanation for these lays on the typical company structure of these activities. These sectors with lower border effect are normally characterized by bigger companies, with more professional management boards and thus with better possibilities to deal with those issues normally causing border effect (language, administrative and fiscal differences, fear of unknown, lack of networks, etc.). On the other hand the sectors with a higher level of border effect may be those with a typical structure of smaller firms, thus having fewer possibilities to cope with the difficulties caused by the border.

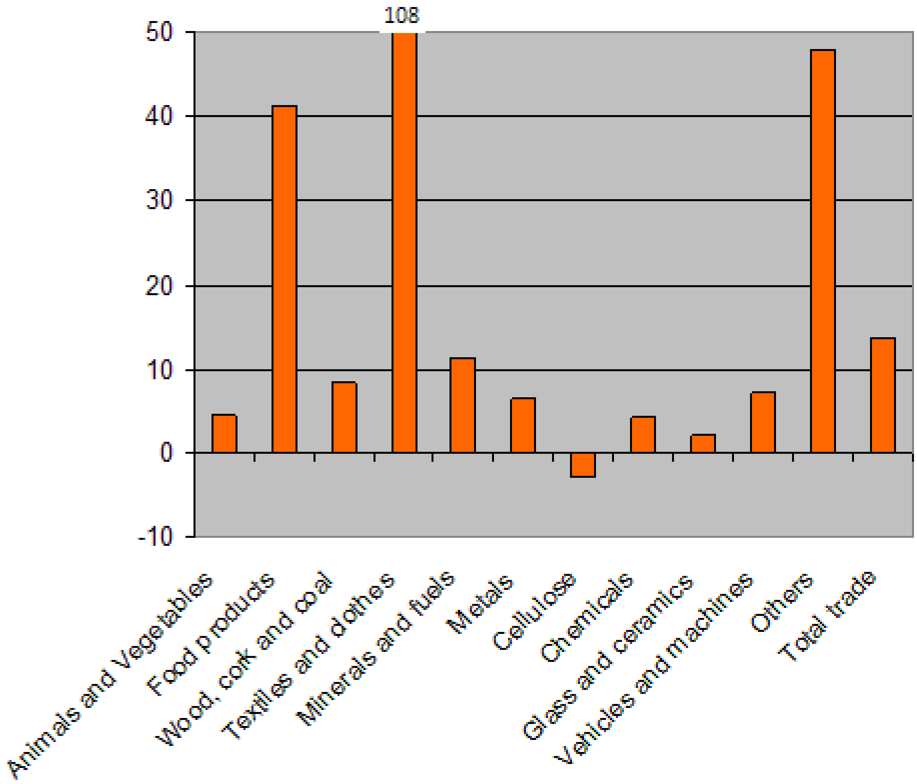
To have an idea of the size of these border effects we may convert these coefficients according to the model definition. The values for trade flow were introduced in the estimations by their logarithms. Thus an increase in the value represents an exponential effect on trade. We may then compute border effect estimators corresponding to the exponential function of the beta coefficients shown in table 5. The results for this conversion are shown in table 6 and in graph 2.

Table nr. 6. Estimators of border effect per sector

		Border Effect			Border Effect
S1	Animals and Vegetables	4,57	S7	Cellulose	-2,92
S2	Food products	41,14	S8	Chemicals	4,25
S3	Wood, cork and coal	8,16	S9	Glass and ceramics	2,13
S4	Textiles and clothes	107,99	S10	Vehicles and machines	7,17
S5	Minerals and fuels	11,28	S11	Others	47,85
S6	Metals	6,47	ST	Total trade	13,65

Value for S7 is minus the exponential of the absolute value of the estimated coefficient.

Graph 2. Border effect per sector



These values represent our estimation for how many times the trade flows between a pair of regions increases by the mere fact that they belong to the same country. If we look the other way around it represents how many times the flows between two regions diminish if there is a national border in between, compared with the potential flow given the size and distance of the regions. For total trade we find a border effect of 14 times, while for textiles this reaches 108 times.

A final word must be written on the strength of these results. The trade values in which we based our model represent a 1999 reality. Many things have changed the interregional scenario in the Iberian Peninsula since then. On the other hand, these are not official statistics but estimations based on international trade data and goods transport data. These are two aspects that induce some caution when interpreting these results. However given the lack of data these figures allow us to present a first estimation on an unknown reality.

Conclusions

We draw a model which estimates the interregional trade flows within the Iberian Peninsula in order to estimate the diminishing trade effect that the border Portugal-Spain has on such flows. We ran this model according individually for each of the eleven economic sectors according to which data was classified. Our main conclusions are the following:

1. According to the prediction, economic size of the regions, measured by their GDPs has a positive effect for interregional trade flows. This is valid for both the size of the seller region (origin) and for the buyer one (destination);
2. Distance between regions has a decreasing effect on interregional trade flows.
3. We could not prove that contiguity between regions has an effect on trade flows. This may be caused by the fact that distance is related with contiguity and our distance variable might be already capturing the contiguity. However, the estimated coefficients for this variable have positive signs suggesting that if there is an effect this one is positive for trade;
4. The border has a statistically significant diminishing effect on interregional trade;
5. Border effect is different for different economic sectors. The sectors of *Glass, Chemicals* and *Metals,* are the ones which present a smaller effect. The sectors of *Textiles, Others* and *Food Products,* are the ones with a higher border effect;
6. The sector of *Cellulose* presents a different trend, appearing to have an opposite sign border effect, this is, higher trade between regions not belonging to the same country;
7. The border is estimated to have a strong effect on trade between the regions of the Iberian Peninsula, reducing 14 times the potential total trade a region establishes with another one from the neighbor country;
8. These values vary significantly from sector to sector, ranging from two times in the sector of *Glass and Ceramics,* to one hundred and eight times in the sector of *Textiles and Clothes*.

Finally, but not less important, it is important to underline the fact that there is a lack of official data on interregional trade flows making this a reality on which very little is known.

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