International trade between Spain-Morocco-Portugal: Are there any opportunities for optical products?

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Abstract

This paper deals with the international trade interrelations between Spain and its closest neighbours to the South and West: Portugal and Morocco. It analyses the importance of optical products in the trade balance with those countries. To do so, a Social Accounting Matrix for Spain is used as a benchmark economic model, where the optical sector has been disaggregated and international coefficients are considered in order to include the effect of Portugal and Morocco in the Spanish economic system. Results show that, although Portugal plays a considerably important role, there are still growth opportunities toward the relations with Morocco.

Resumen

Este trabajo trata sobre las relaciones internacionales entre España y sus vecinos más cercanos al sur y oeste: Portugal y Marruecos, analizando la importancia de los productos ópticos en la balanza con dichos países. Para ello, se hace uso de la Matriz de Contabilidad Social para España como modelo económico de referencia, donde el sector óptico aparece desagregado, además se consideran coeficientes internacionales con la finalidad de incluir el efecto de Portugal y Marruecos en el sistema económico español. Los resultados muestran que, a pesar de que Portugal ocupa una posición considerablemente importante, aún existen amplias oportunidades de crecimiento en las relaciones hacia Marruecos.

Key Words: International trade, optical products, input-output analysis, matrices de contabilidad social.

JEL codes: C67; F59; L6; P45

1. Introduction

The justification of this paper comes from the advantage of the Spanish geographical location with respect to Morocco and the increasing demand for visual corrective aids at the global level. There are existing intensive trade relations between Spain and Morocco, in fact, Spain and France are Morocco's main trade partners, representing more than 40% of total exports. However, the share of Spain and France in Morocco's imports reach only 26% of the total (MAEC, 2015). Therefore, Spanish trade balance with its neighbour to the south is negative.

Traditionally, relations with the African continent were affected by high tariffs (Cohí, 2003), however an expansion in the international trade was expected for the reduction in tariffs agreed between European Union and Morocco[1] (CE, 2000), replacing the previous Association Agreement EU-Morocco from 1996 and recently revised in Negotiations for a Deep and Comprehensive Free Trade Agreement (DCFTA) in the views of including a wider range of trade aspects, such as industrial standards and technical regulations.

Existing literature pays attention to effects of a unique market between EU and Morocco in the work of Blanes and Milgram (2010), in relation with the decrease in the tariffs on European products in Morocco. Other authors focus their interest in specific sectors such as agriculture, more specifically the tomato sector, analysing substitution effects between Spain and Morocco or The Netherlands (de Pablo, Pérez, & Lévy, 2008), fishing (Lagares & Ordaz, 2008), as one of the most important factors in the trade relations between Spain and Morocco, and clothing (Tokatli, 2008) analysing the case *Zara* and the localization of industry. Large literature is found in the field of migration between Spain and Morocco (Baldwin-Edwards, 2006; Hermanu, 2006; Carling, 2007; de Haas, 2007; Ferrer, 2008) and related with the foreign policy from the Moroccan perspective (Fernandez-Molina, 2016). However, to our knowledge, little attention has been paid to economic analysis from the academic point of view in the last years, since Jordan (1997) analysed the existing economic interrelations, Moré (2004) studied differences in GDP per capita and demonstrates and increasing differential between Spain and Morocco, and Blances and Milgram (2010) evaluated regional and sectoral implications in the frame of a gravity equation.

The novelty of this research relies: (1) in the extension of the economic analysis and the opportunities to enhance economic relations with near neighbours, as the case of Morocco, and (2) in the sectoral analysis that escapes from the traditionally analysed sectors, such as tourism or agriculture, where the comparative advantage with neighbouring economies it is not clear.

[1] Morocco tariffs by sectors can be found in Blanes and Milgram (2010).

In contrast with previous studies, this present work deals with the quantification of the economic impact of a marginal change in the exports from Morocco and Portugal by sectors in Spain using input-output techniques, that enables to consider indirect effects within the impact, and in the frame of a Social Accounting Matrix (SAM). Thus we consider final demand accounts endogenous in the model and the circular flow of income is included in the total economic impact. Furthermore, the core of our analysis is on optical products, facing and increasing demand at the global level for uncovered visual needs mainly in developing countries (Pascolini & Mariotti, 2012; WHO, 2013), so that opportunities for Spain can be considered in this field. The comparison with the effects of Portugal is considered as an indicator of the potential proximity benefits.

The remaining of this paper is structured as follows: Section 2 explains the methodology used for the analysis; Section 3 provides data on trade for Spain, Morocco and Portugal and results on the economic impact of optical products from an international trade perspective and Section 4 presents the final conclusions.

2. Data and methodology

Data on international trade between Spain, Morocco and Portugal have been obtained from the following databases: Estacom (ICEX, 2015) and Comtrade (UN, 2015). An in depth analysis of main trade flows for the three countries considered is developed for the whole economy, with a special attention to optical products, including: corrective lenses and glasses.

In order to establish the relevance of foreign sector in the Spanish economy the SAMESP-08 (Fuentes & Mainar, 2014) is used, taking into account input-output analysis techniques to determine economic impact multipliers. An input-output model is constructed following the equation: $x = (I - A)^{-1} f$, where x is the economic output, $(I - A)^{-1}$ represents the technology matrix indicating the structure of the economy and f stands for the exogenous account considered. In our case we set the foreign sector as exogenous in the model. In order to disentangle backward and forward effects both: Leontief and Ghosh models are used in order to ascertain the effect of: (1) a unitary variation of the exogenous account in the rest of the economy due to each sector, that is the backward effect; and (2) the effect of a unitary variation in the total economic system over a specific sector, that is the forward effect; we will focus on the former.

With the previously explained concept of backward and forward multipliers applied to the Spanish economy, foreign sector is considered exogenous and the value of exports to Morocco and Portugal is weighted. Thus the importance of the international trade for the

Spanish economy is assessed. Resulting value will be considered as an indicator of the trans-border trade relations.

Multipliers matrix is obtained as follows: $(\mathbf{I}-\mathbf{A})^{-1}=\mathbf{M}$, and $\mathbf{M}_{\mathbf{j}}=\sum_{\mathbf{i}=\mathbf{1}}^{\mathbf{n}}\mathbf{b}_{\mathbf{ij}}$ represent the demand multipliers, a more extended explanation of the construction of the multiplier matrix can be found in Blancas (2003), Sancho & Cardenete (2014) and Cardenete et al. (2014; 2015). Thus, $\mathbf{M}_{\mathbf{j}}$ provides the backward effect by sectors. Therefore, the share of that vector over the exports vector gives an approximation of the backward effect that Portugal and Morocco cause in the Spanish economy. This way, we obtain the "importance index" of Portuguese and Moroccan economies in the Spanish economy, denote by: $\psi = M^{t}_{.j} \otimes e^{r}$. Where e^{r} is the export vector, r is the index that indicates the region, with r equals to Portugal or Morocco, and $M^{t}_{.j}$ is the column vector corresponding to backward, or demand, effects in the Spanish economy, this method is similar to the new sector approach for disaggregation of economic activities used in Miller and Blair (1985; 2009). The productive sectoral scope of the analysis is classified in Table 1.

Table 1 Sectoral accounts considered in the model

	Productive accounts
1	Agriculture, livestock and forestry
2	Fisheries and aquaculture
3	extractive industries
4	Food products, beverages and tobacco
5	textiles and clothing , leather and footwear
6	Manufacture of wood and cork
7	Paper industry , publishing, printing and reproduction of recorded media
8	Manufacture of coke , refined petroleum products and nuclear fuel
9	Chemistry industry
10	Processing industry of rubber and plastic products
11	Industry other non-metallic mineral products
12	Metallurgy and manufacture of metal products
13	Construction industry machinery and mechanical equipment
14	Repair and installation of machinery and equipment
15	Industry electrical equipment , electronic and optical
16	Manufacture of transport equipment
17	Various manufacturing industry
17b	Ophthalmic Optics
18	Production and distribution of electricity , gas and water
19b	Trade and services

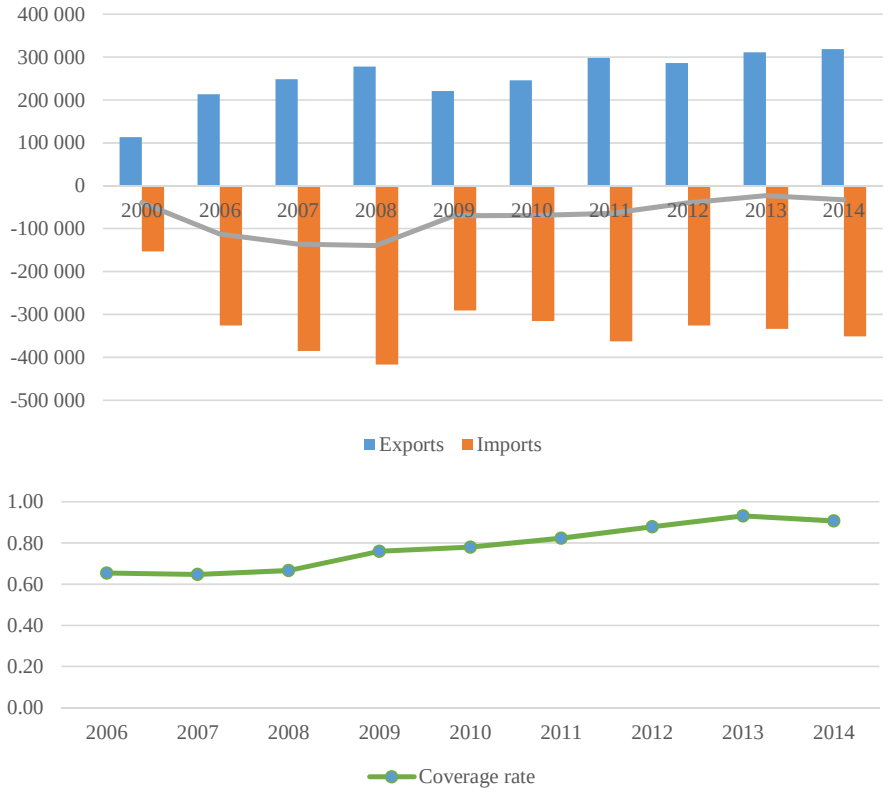
Own elaboration. Source: SAMESP-08, Fuentes & Mainar (2014)

3. Spanish international trade with Morocco and Portugal.

3.1. Main inter-country flows.

Spanish trade balance was negative by 24,471 million of euros in 2014 (Estacom). Exports and imports reached 240 and 264 thousands of million euros, or 318 and 351 thousands of million USD (UN, 2015)[2]. Thus the coverage rate reach 91%, 3% lower than that of 2013 due to a higher increase in imports than in exports, the evolution is described in Figure 1, where the grey line indicates the trade balance.

Figure 1 International trade in Spain

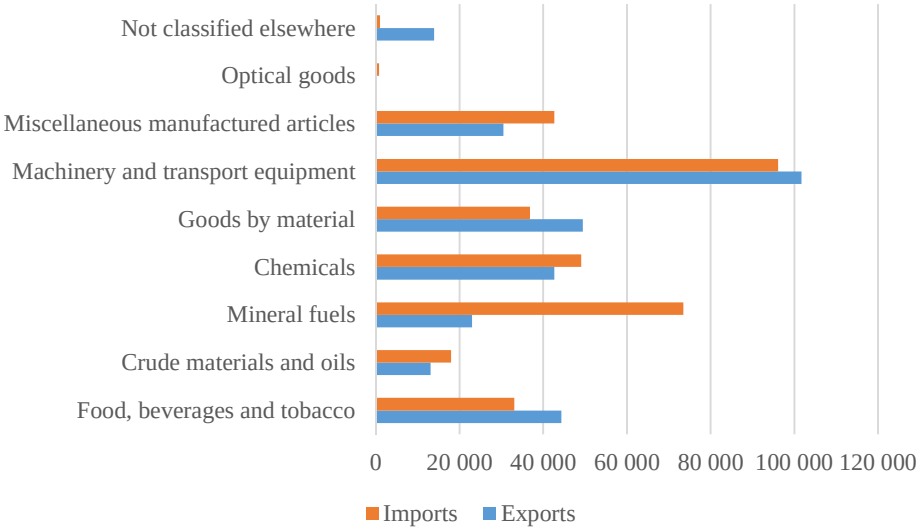


Own elaboration. Source: UU.NN. (2015) Exports, imports in millions of USD.

Spanish trade structure by products is charted in Figure 2, where machinery and transport equipment is the main type of product exported and mineral fuels is the main type of product imported. Trade by regions is represented in Figure 3, Europe is the destiny of 70% of total exports, while Africa is the last recipient partner with 7% of total.

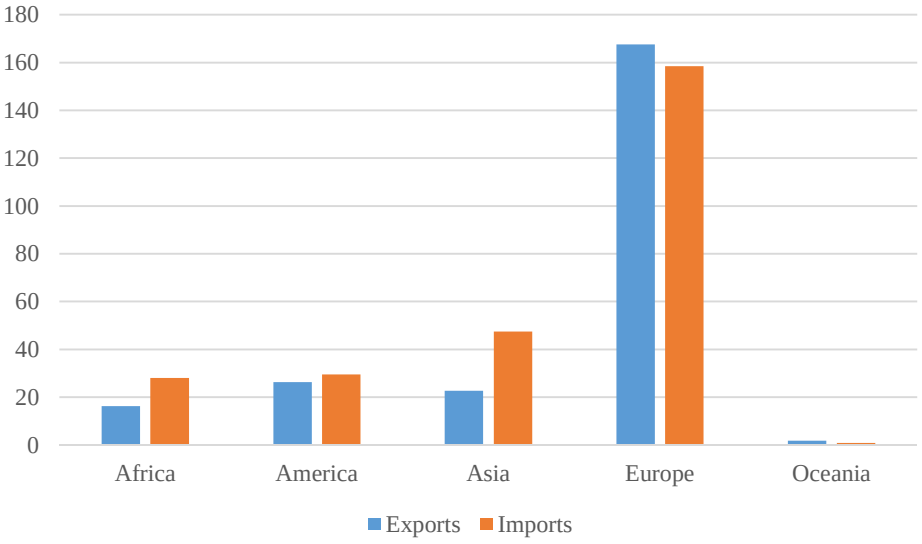
[2] A reference to USD value is made in order to enable the comparison with Comtrade data.

Figure 2 International trade by products



Own elaboration. Source: Comtrade, (UN, 2015) Units in millions of USD.

Figure 3 Spanish international trade by regions

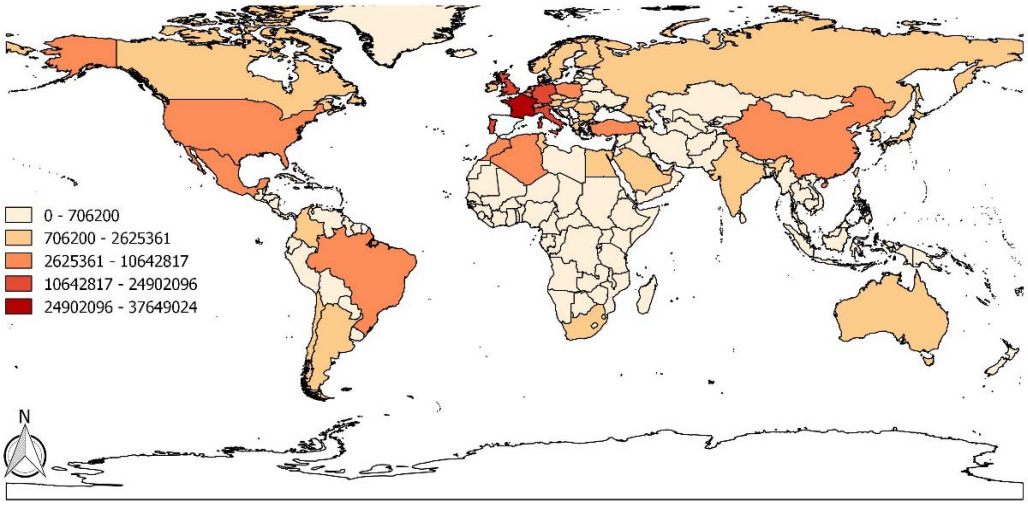


Own elaboration. Source: Estacom. Units in thousand millions euros.

Spanish imports reach 264 thousand millions euros in 2014, although these are not as concentrated as exports flows, Europe represents also a high share of the total, with 60% (158 thousand million euros), and similarly to the outgoing flow, Africa (11%) is the last position.

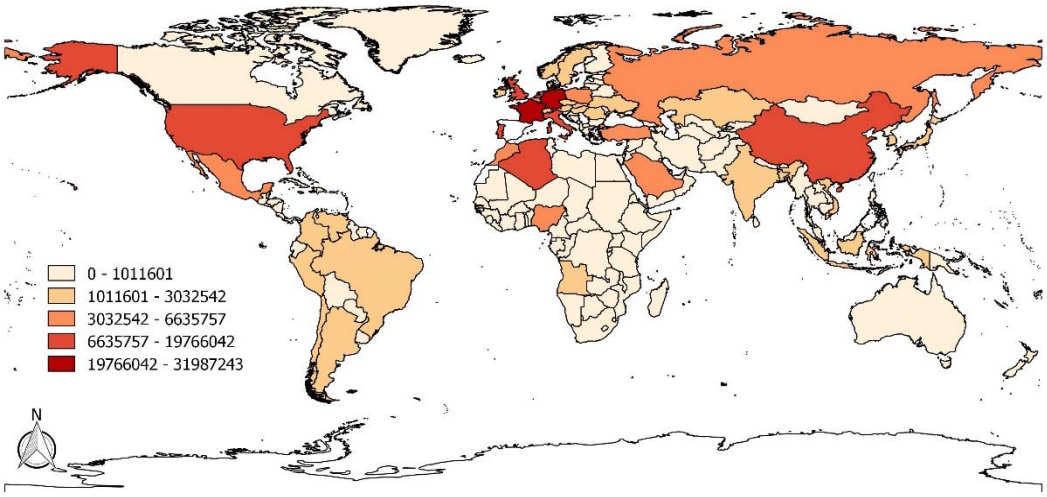
Destinies and origin of the Spanish international trade are found in maps 1 and 2, where is represented not only the high dependence from Europe in exports, but also the concentration of imports from Europe, USA and China.

Figure 4 Exports from Spain



Own elaboration. Source: Estacom (ICEX, 2015). Units in thousand million euros.

Figure 5 Imports to Spain



Own elaboration. Source: Estacom (ICEX, 2015). Units in thousand million euros..

Table 2 International trade: Spain-North Africa

	Imports		Exports	
	Total value	Share in the upper geographical level	Total value	Share in the upper geographical level
Total	264 506 726	100%	240 034 872	100%
Africa	28 109 153	11%	16 318 362	7%
North Africa	14 995 040	53%	12 163 778	75%
Algeria	9 060 392	60%	3 701 063	30%
Egypt	597 520	4%	1 149 433	9%
West Sahara	n.a.	n.a.	2 871	0%
Libya	876 514	6%	564 139	5%
Morocco	4 054 882	27%	5 834 572	48%
Tunisia	405 732	3%	911 699	7%

Own elaboration. Source: Eurostacom (ICEX, 2015). Units in thousand euros.

The two main partners in Africa: Morocco and Algeria are those with a higher increase in the evolution of exchanges. Import growth has reach up to twice the initial value for the case of Algeria and near 50% for the case of Morocco in the period from 2010 to 2014 (Table 3). While exports growth reaches 81% and 68%, respectively (Table 4). Therefore, although trade with North Africa represents around 5% of total international trade in Spain, there is a high increase through last periods, especially in exports.

Table 3 Imports from North Africa to Spain

	2010	2011	2012	2013	2014
DZ: Algeria	4 557 970	5 669 994	6 884 557	9 260 282	9 060 392
EG: Egypt	1 356 689	1 397 659	1 140 977	887 943	597 520
LY: Libya	3 352 839	739 768	3 322 581	1 927 799	876 514
MA: Morocco	2 747 344	3 100 629	3 122 511	3 530 008	4 054 882
TN: Tunisia	624 287	597 592	575 452	563 483	405 732

Own elaboration. Source: Eurostacom. Units in thousands of euros.

Table 4 Exports from Spain to North Africa

	2010	2011	2012	2013	2014
DZ: Algeria	2 041 154	2 498 805	3 461 147	3 894 126	3 701 063
EG: Egypt	901 911	803 162	1 077 829	1 077 571	1 149 433
LY: Libya	253 618	109 671	379 980	464 039	564 139
MA: Morocco	3 482 819	4 130 312	5 294 760	5 521 257	5 834 572
TN: Tunisia	895 609	850 255	995 120	923 222	911 699

Own elaboration. Source: Eurostacom. Units in thousands of euros.

A more homogenous pattern is found in international flows with the European Union. Germany, France, Italy, Netherlands, Portugal and Belgium account for more than 80% of the total amount of imports to Spain (Table 5), and those countries are main partners in exports as well, but with a higher representation (84%) in the total flow. Relations of Spain with Germany and France are remarkable in imports, however exports are more concentrated through the French economy.

Table 5 International trade: Spain-European Union

	Imports		Exports	
	Total value	Share in the upper-level region	Total value	Share in the upper-level region
Total world	264 506 726	100%	240 034 872	100%
45: Europa	158 470 911	59.91%	167 603 220	69.82%
46: European Union	141 068 883	89.02%	152 292 212	90.86%
AT: Austria	1 727 214	1.22%	1 945 598	1.28%
BE: Belgium	6 635 757	4.70%	6 061 136	3.98%
BG: Bulgaria	459 590	0.33%	1 294 125	0.85%
CY: Cyprus	19 608	0.01%	292 593	0.19%
CZ: Czech Republic	3 017 391	2.14%	1 744 114	1.15%
DE: Germany	31 987 243	22.67%	24 902 096	16.35%
DK: Denmark	1 458 661	1.03%	1 153 990	0.76%
EE: Estonia	977 131	0.69%	149 655	0.10%
ES: Spain		0.00%		0.00%
FI: Finland	937 544	0.66%	809 489	0.53%
FR: France	29 007 060	20.56%	37 649 024	24.72%
GB: United Kingdom	11 057 134	7.84%	16 510 717	10.84%
GR: Greece	487 623	0.35%	1 891 623	1.24%
HR: Croatia	76 508	0.05%	235 234	0.15%
HU: Hungary	1 905 209	1.35%	1 172 984	0.77%
IE: Ireland	2 523 457	1.79%	1 109 042	0.73%
IT: Italy	15 546 134	11.02%	17 249 830	11.33%
LT: Lithuania	196 972	0.14%	365 895	0.24%
LU: Luxembourg	406 093	0.29%	261 121	0.17%
LV: Latvia	595 772	0.42%	179 046	0.12%
MT: Malta	47 379	0.03%	209 952	0.14%
NL: Netherlands	10 597 028	7.51%	7 414 359	4.87%
PL: Poland	3 914 608	2.77%	3 925 390	2.58%

PT: Portugal	10 008 335	7.09%	18 013 878	11.83%
RO: Romania	1 171 828	0.83%	1 568 782	1.03%
SE: Sweden	2 315 605	1.64%	2 047 985	1.34%
SI: Slovenia	264 882	0.19%	557 022	0.37%
SK: Slovakia	1 463 875	1.04%	706 200	0.46%
ZQ: EU s.d.	2 263 242	1.60%	2 871 332	1.89%

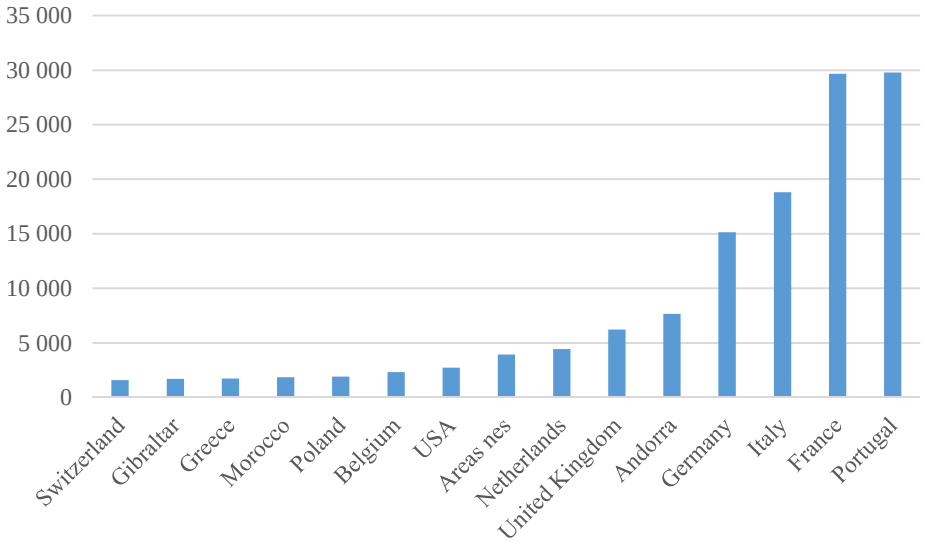
Own elaboration. Source: Eurostacom (ICEX, 2015). Units in thousands of euros.

3.2. Ophthalmic optical flows.

Ophthalmic optical international trade in Spain is assessed in 445 millions of euros in terms of imports and 111 millions in terms of exports for 2014 (ICEX, 2015), that is 0.05% and 0.17% of total exports and total imports, and therefore the coverage rate is 26% in optical products. Thus, the dependence of the Spanish economy in optics in much higher than for the total economy.

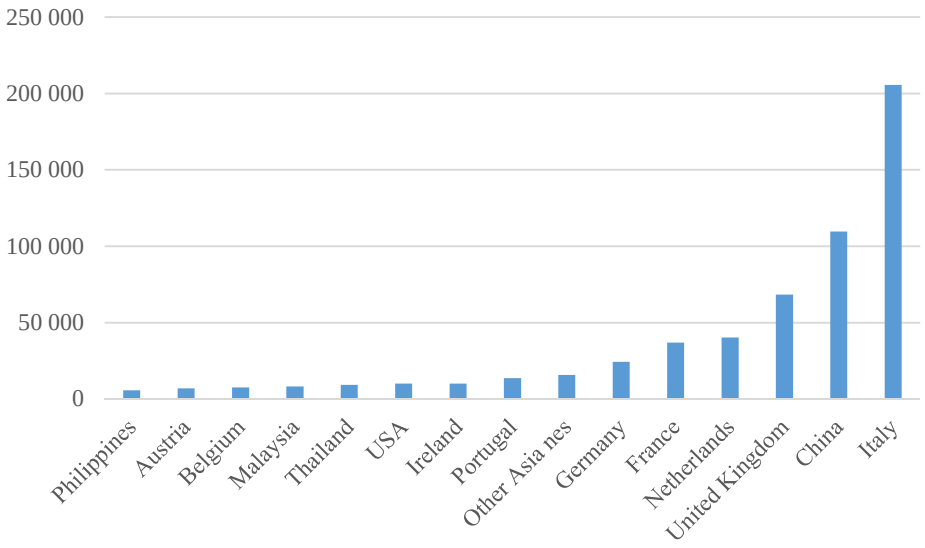
Regarding the spatial distribution of trade, both: exports and imports are highly concentrated within few partners (Figure 6 andFigure 7). According to the data, 80% of total exports are concentrated within the 10 main partners, led by Portugal and France, while near 90% of total imports have origin in the ten main partners, with Italy and China on the top list.

Figure 6 Ophthalmic optical exports: Main partners



Own elaboration. Source: Comtrade (UN, 2016). Units in thousands of USD.

Figure 7 Ophthalmic optical imports: Main partners



Own elaboration. Source: Comtrade (UN, 2016). Units in thousands of USD.

Table 6 Evolution of ophthalmic optical international trade by products in Spain

	2011		2012		2013		2014	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
LC	12 928	77 919	14 877	71 020	16 933	71 869	16 163	80 782
LOV	9 361	24 776	4 688	18 047	2 805	21 617	1 870	13 966
LONV	6 945	44 543	7 028	46 349	7 822	46 118	7 172	53 596
MP	15 807	34 046	22 789	38 896	25 358	40 293	32 238	44 851
MNP	5 244	53 773	7 362	44 436	6 677	42 599	7 512	43 793
PMON	405	4 251	2 151	4 804	553	4 613	752	4 978
GS	32 394	172 819	35 129	184 259	36 139	171 420	37 358	178 992
GCYO	9 456	30 856	7 193	26 937	10 875	28 613	10 787	38 042

Own elaboration. Source: Estacom (ICEX, 2015) Units in millions of euros. LC: Contact lenses; LOV: Mineral spectacle lenses; LONV: Other material spectacle lenses; MP: Plastic spectacle frames; MNP: Other material spectacle frames; PMON: Spectacle frame parts; GS: Sunglasses; GCYO: Corrective and protective glasses

Optical international trade in Spain is led by sunglasses, not only in terms of imports but also in terms of exports (Table 6). However, the evolution of frames and ophthalmic lenses exports have not followed a steady tendency, since traditionally there has been a lag between the market demands and the Spanish production[3]. Thus the specialization of the Spanish optical international trade shows high fluctuations, especially in mineral lenses and plastic frames exports, presenting the highest standard deviations from the average, which is remarkably

[3] For further details see Barrera et al (2016).

higher for mineral lenses in comparison with the trade value. Similarly to the total economy, optical imports have mainly its origin in the European Union, more specifically in Italy (frames and sunglasses), Germany and France (ophthalmic lenses) and United Kingdom (contact lenses).

According the trade flows with Morocco and Portugal (south and west from Spain), there is a lower activity than that taking place with France and Italy (north and east): only 1.25% of Spanish optical exports have Morocco as destiny, which is a high percent in comparison to the share in imports that accounts for 0.2%. In contrast, 20% is the share of optical imports with Portugal as a partner, although the share in imports is still negligible: 2.2% of optical Spanish imports. Thus the coverage rate with this two countries in terms of optical products is clearly positive, although the representation of ophthalmic optics in the total trade is only higher than for the entire World for the case of outgoing flows to Morocco (Table 7 andTable 8), that is optics exports to Morocco in relation to total exports to Morocco is higher than optics exports in relation to total exports to the entire World. Therefore some trade policies may be promoted in this field.

Table 7 Share of ophthalmic optics in total Spanish trade

	Total economy	Ophthalmic optical products	Share in total
Exports	230 571	112	0.05%
Imports	264 507	445	0.17%

Own elaboration. Source Estacom (ICEX, 2015). Units in millions of euros for year 2014.

Table 8 Share of ophthalmic optics in trade with Morocco and Portugal

	Total trade with Morocco	Ophthalmic optics: Morocco	Share in total	Total trade with Portugal	Ophthalmic optics: Portugal	Share in total
Exports	5 798 349	1 399	0.02%	17 986 643	22 426	0.12%
Imports	4 053 032	851	0.02%	10 007 590	10 241	0.10%

Own elaboration. Source Estacom (ICEX, 2015). Units in thousands of euros for year 2014.

Table 9 Trade flows with Morocco and Portugal by optical products

	Morocco		Portugal	
	Exports	Imports	Exports	Imports
LC	0.66	-	7 802.93	103.55
LOV	174.70	850.55	176.20	3 760.74
LONV	812.17	-	3 824.07	4 672.41
MP	57.37	-	1 623.89	197.84
MNP	21.28	-	1 227.25	68.70
PMON	2.53	-	367.72	703.38
GS	155.08	0.03	3 205.62	364.83
GCYO	178.76	-	4 198.77	363.64
Total optics	1 402.52	850.58	22 426.44	10 235.10

Own elaboration. Source: Estacom (ICEX, 2015) Units in thousands of euros for year 2014. LC: Contact lenses; LOV: Mineral spectacle lenses; LONV: Other material spectacle lenses; MP: Plastic spectacle frames; MNP: Other material spectacle frames; PMON: Spectacle frame parts; GS: Sunglasses; GCYO: Corrective and protective glasses.

Regarding optical trade with Morocco we observe that is unidirectional, as is based on outgoing flows from Spain, except for the case of non-mineral lenses, those lenses in which last innovative advances are focused in the last years[4]. Similarly, relations with Portugal in the field of study show how exports more than double imports, however the opposite situation occurs for ophthalmic lenses, both plastic and mineral lenses (Table 9), since imports are higher than exports.

4. The relative importance of international trade in the Spanish economy

In this Section the influence of Portuguese and Moroccan trade within the Spanish economy is analyzed, with special attention to the opportunities in the optical field. To do so, foreign sector accounting multipliers are calculated as an index of the importance of these two sectors for Spain and to ascertain to what extend it would be beneficial for the Spanish economy an expansion in that direction. .

To establish a suitable comparable scope of sectors, an aggregated service sector is considered gathering trade and services (19b), and thus to be able to evaluate the multiplier

[4] for instance the work of Ozdemir et al (2016) in relation to the ultraviolet radiation (UVR) for different types of lens materials

effect of foreign sector with origin in Morocco and Portugal. The reason to do so relies in two aspects first, the existing disparities among services activities and industrial sectors, for instance the construction sector that present a higher multiplier effect than rural and industrial activities; and second, the shortage of international services trade datum.

The main research question in this paper is: Do the Spanish economy can obtain a benefit in terms of economic growth when an exogenous demand in visual corrective products take place? In order to adapt that statement to the methodological tools a restatement is made so that an importance index is considered to answer the following equivalent question: What would happened to the Spanish economy if trade relations with Portugal and Morocco stop? Results offer the possibility of establishing a relative importance ranking by sectors. The process to create such an indicator is to calculate the backward multiplier effect of every sector, with an exogenous foreign sector, thus considering a total foreign accounts multiplier method, explained previously.

The weight of trade flows with the multiplier effect enables to calculate which would be the lost for the Spanish economy if international relations cease. Assuming the limitations of the model, that does not consider changes in the interaction with the rest of economies, it is considered to be a good proxy for the evaluation of the trade relations by productive activities. Furthermore, it is possible to compare that multiplicative effect with the total output of the economy by sectors, that is, to compare the importance of those effects.

International trade data from Estacom (ICEX, 2015) between Spain and Morocco and between Spain and Portugal have been used to assess the weight factors in the model[5]. Results are presented in Table 10 and Figure 8.

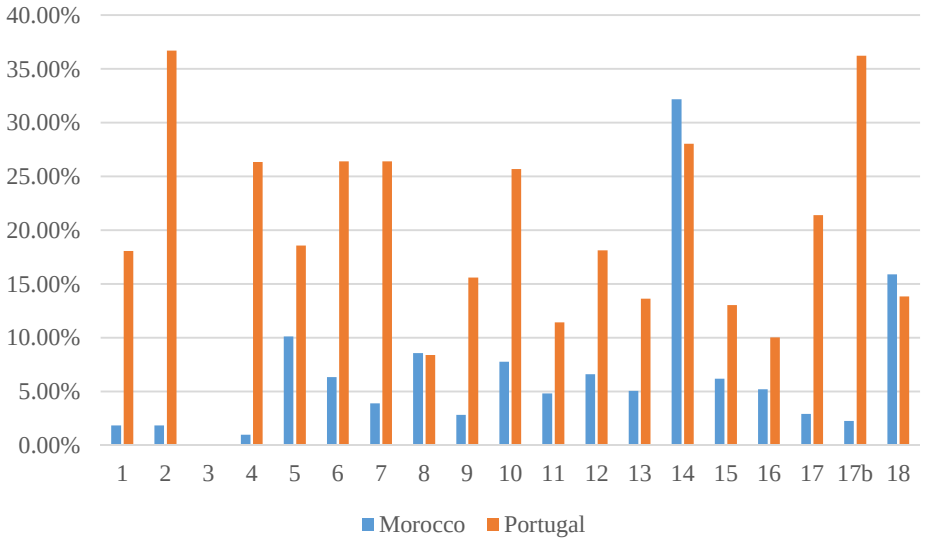
[5] This database is focused on goods trade. Therefore F, G, H and I class in NACE Rev.2 are not considered. For that group of sectors: the weight average of classes: M, J and R, corresponding in the SAM with research and development, computer services and other business services and recreational, cultural and sporting activities. Thus, the average of these two sectors is used as general weight for the rest of services, except various personal service activities and households employing domestic staff, since we consider do not maintain any trade relations with Portugal and Morocco.

Table 10 Portuguese and Moroccan share in Spanish exports and total-relative importance of exports by sectors.

Sector	Share of exports to Morocco by sectors	Share of exports to Portugal by sectors	Total relative importance of exports to Morocco	Total relative importance of exports to Portugal
1	0.77%	7.61%	0.04%	0.38%
2	1.19%	23.39%	0.00%	0.06%
3	0.84%	2.32%	0.00%	0.00%
4	0.47%	12.59%	0.05%	1.31%
5	5.23%	9.61%	0.16%	0.29%
6	4.49%	18.73%	0.03%	0.14%
7	2.38%	16.08%	0.07%	0.45%
8	7.29%	7.14%	0.20%	0.19%
9	1.29%	7.07%	0.10%	0.55%
10	3.36%	11.11%	0.09%	0.29%
11	2.59%	6.13%	0.07%	0.18%
12	3.17%	8.69%	0.30%	0.82%
13	2.53%	6.81%	0.09%	0.23%
14	41.78%	36.39%	0.13%	0.11%
15	4,20%	8.85%	0.16%	0.33%
16	1.63%	3.14%	0.23%	0.44%
17	1.85%	13.52%	0.03%	0.22%
17b	1.25%	20.02%	0.00%	0.01%
18	41.78%	36.39%	0.45%	0.39%
19b	0.03%	10.24%	0.02%	6.78%

Own calculations. Sources: Estacom (ICEX, 2015), SAMESP-08 (Fuentes & Mainar, 2014) and SAMESPV-08 used in Barrera el at. (2015). Sector descriptors follow previous correspondence shown in Table 1. Total relative importance as a share of the backward multiplier effect in the total-economy output

Figure 8 Relative importance index of Spanish exports to Morocco and Portugal.



Own calculations. Sources: Estacom (ICEX, 2015), SAMESP-08 (Fuentes & Mainar, 2014) and SAMESPV-08 used in Barrera el at. (2015). Sectoral descriptors follow previous correspondence shown in Table 1. Relative importance as a share of the backward multiplier effect in the total sectoral output.

Reddish cells in Table 10 are those with the above average total-relative importance in each of the countries considered. Number of sectors above average is lower in the Portuguese analysis, but backward effects of international trade relations with Portugal is larger than with Morocco. Furthermore, the relevance do not rely in the number of sectors, but in the multiplier intensity over the total output of the economy, that is the linkages with Portugal are more intense, but those with Morocco are more diverse.

In depth analysis by sectors, indicates that ophthalmic optical sector (17b) stands out among the others (Figure 8) when Portuguese flows are considered. Furthermore, the comparison between the total coverage rate (25%) and the country coverage rate (164% with Morocco and 218% with Portugal), is an indicator of the comparative advantage of optics with those two countries. Nevertheless, the size of those flows are, as mention before, nearly negligible. Therefore, the importance of optical exports to Morocco is one of the lowest in absolute terms (8 million of euros) and the total relative importance, that is the share in the total economy output, is non-existent. Nonetheless, optical exports to Portugal, as mentioned before, reach 20% of total optical exports to the entire World, whose total relative importance, that is in terms of output, is 0.01%. In other words, the stop of optical exports to Portugal would lead to a negative effect in the Spanish economy of 136 million of euros.

Considering the total economy, the highest relevance of Portuguese economy is characterized by a highest concentration. Thus, most important Portuguese sectors for the Spanish economy are: 4, 12 and 19b (Table 11). Regarding Morocco (Table 12), the importance and the concentration by sectors is lower than for the Portuguese case, with 0.11% of average

effect (against 0.66% of the Portuguese economy) and 0.001 of Standard deviation (against 0.014 of Portugal). The most important flow towards Morocco is production and distribution supplies (0.45%), with a lower impact than the average for Portugal. As a whole, trade relative importance with Morocco is quantified in 2.21% of the Spanish economy, while trade relative importance with Portugal is quantified in 13.16% of the total Spanish economy.

Table 11 Sectors with an above average effect due to trade relations with Portugal.

4	Food products, beverages and tobacco
12	Metallurgy and manufacture of metal products
19b	Trade and services

Own elaboration. Equivalences of sectors is referenced in Table 1

Table 12 Sectors with an above average effect due to trade relations with

5	Textiles and clothing, leather and footwear industry
8	Coking plants, oil refining and nuclear fuels treatment
12	Metallurgy and metal products manufacturing
14	Repair and installation of machinery and equipment
15	Electric, electronic and optical equipment industry
16	Manufacture of transport equipment
18	Production and distribution of electricity, gas and water

Own elaboration. Equivalences of sectors is referenced in Table 1

5. Conclusiones

Exports structure of the three economies considered trigger the promotion of trade relations between neighbours, with the three of them presenting a negative trade balance. Regardless of that situation, the Spanish linkages with Portugal are considerably higher than those taking place with Morocco. Facing this situation, there are two aspects to tackle, first: taking the advantage of geographical location to approximate linkages with Morocco to those with Portugal; and second: expanding the scope of sectoral specialization and diversification in order to differentiate from neighbours and being able to promote trade with them.

Regarding the second aspect, ophthalmic optics is considered to be a possible "new sector" to promote in order to favour the international trade taking advantage of: geographical localization and potential increasing demand. From the international trade analysis in the frame of input-output techniques the importance of the Portuguese linkages are quantified in 136 millions of euros, significantly higher than the initial importance of Morocco: 8 million of euros. Considering that proximity with Portugal can serve as indicator of the potential importance of Morocco, we conclude that there are still possibilities for the promotion of trade. In this aspect, it is remarkable that optical exports to Morocco present a higher share in the total flow to Morocco than for the total Spanish exports.

Furthermore, in the context of trade openness between Europe and Africa, Spain can easily consider to play a role in order to improve the trade flows with Morocco, promoting sectors with a higher comparative advantage than traditionally analysed sectors, and taking advantage of the potential increase in the demand for visual products, especially from developing countries. Furthermore, there is an existing increment in the trade relations with North African countries, due to the existence of new economic agreements with European Union.

The share of optics in exports to Morocco exceeds the share of optics in the total exports from Spain, therefore, advantage of the comparative advantage can be consider to enhance the relations with Morocco in this field. Furthermore, although the intensity of the economic effect with origin in Portugal are more intense, there is a more homogeneous trend by sectors due to linkages with Morocco, that is the scope of links is wider. Thus there is not a high specialization in trade flows. According to the relative importance, considering only the size of the sector and not the share for the total economy, ophthalmic optical linkages are in fact one of the highest values for the Portuguese links.

This paper propose the promotion traded between Morocco and Spain not relaying in similar comparative advantage, and instead develop relations in the field of ophthalmic optics. That would improve economic relations against the traditional Heckscher-Ohlin model that

would not benefit the trade flows among similar economic structures, as it is the case. Further analysis will be develop in this field and the relation with the distance cut-off value to determine whether the Portuguese linkages could be translated into the Morocco scope.

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