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Should Almería (Spain) have to be worried, thinking that their tomato export is currently affected by international competition?

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Abstract

In this paper, a critical view is presented concerning the internal organization of the exporting sector of Almería: the most important problem observed is that the marketing system is "atomised" and very heterogeneous. Secondly, this sector is compared with the other principal tomato suppliers of European Union (The Netherlands, Morocco and other areas of Spain): the analysis shows that Almería, in the last years, has defended its market share. Finally, the most influential variables in the commercial process are analysed by an exportation model, resulting that there are effects of substitution of the Almerian tomato for products from others origins, mostly the Netherlands.

Keywords: *Trade, vegetables, competitiveness, social economy, cooperative, retailer*

Introduction

In order to answer the question above this article, we will analyse the situation of Almería, which is the most important exporting area of tomato in Spain in 2004 (the first exporter country in the European Union with the 38% of market share); in the last ten years, its exports have increased more than the other Spanish producing zones: in 1995, Almería represented 17% of the total Spanish exports (behind Las Palmas that represented 27%) and currently Almería represent the 38% (280 millions of euros, see Table 1). Historically Spanish tomato exports were a Canary Islands initiative. Later, in the 1940's, winter crops were introduced into Alicante and Murcia by the Canary Island companies (Cortés Perez, 1989). In general, the most important diferent of Almería with regard to other tomato exporter province, is the existence, in the main, of Social Economy Companies (Cooperatives) in which farmers are the proprietaries. The current international context worries to Almerian farmer because the competition of other external European Union origins (for example of Morroco) can mean the disappearance of the existent marketing system. Why? Because this system goes joined to the territory.

Description of the marketing system of Almeria (Spain)

In Almería there is an important division between two distribution systems (De Pablo et al., 2004): 1- The auctions (which normally are limited societies); 2- The destination commercialising companies (more important exporters), which are mainly Agrarian Transformation Societies (SAT) and Cooperatives (SCA). The SAT and SCA respond to the social economy concept, which means that the companies do not have a direct

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profitability interest. Their main objective is to attend the needs of their individual partners (members). Each system represents about 50% of the total local production-export of fruit and vegetables.

Actually, auctions are trying to change the way of commercialisation by selling part of their production directly abroad. This is, most probably, caused by the unstoppable concentration of retailers. Groups like Carrefour, Metro, Ahold, Aldi and Rewe control the detailed sales to the consumer in European Union. Indirectly, they also control the fruits and vegetables offer: they directly impose their rules (standards) of production and packaging[1].

Table 1. Tomato exports from Spain, 2004

Province	x1000 t	x1000 euros	% Value	% Weight
Alicante	63.642	46.191	6,2	5,8
Almería	391.409	279.576	37,9	35,4
Granada	48.535	84.716	4,7	10,7
Murcia	222.878	145.005	21,6	18,4
Las Palmas	137.917	105.142	13,4	13,3
Tenerife	81.953	56.563	7,9	7,2
Valencia	42.586	36.433	4,1	4,6
Other	43.106	36.164	4,2	4,6
T O T A L	**1.032.026**	**789.790**	**100**	**100**

Source: Own elaboration with customs data.

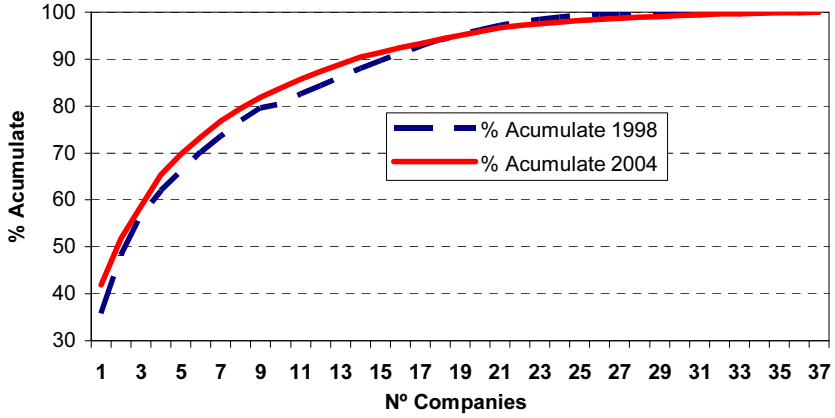
Furthermore, the main problems of the social economy companies are:

1. The difficulty for concentration. The companies that commercialise fruits and vegetables in destination look like a homogeneous group but, in fact, they are not. We can find:
   a) Companies controlled by a wide social base (all of them SCA);
   b) Companies controlled by a small group of partners (some SCA and SAT);
   c) Family companies, as well as larger cooperatives, with the auction as commercialisation system;
   d) Big size SAT's, with production facilities and land owned by a limited number of partners.

   The presence of these different enterprises favours the actual situation of "atomisation".
2. There are strong difficulties for raising funds from the individual partners in order to begin innovative projects. For example for marketing departments, or for investments in infrastructure for trading with products from other countries.
3. There is a high risk in the social economy companies, derived from the specialisation in fixed products: tomato, pepper, cucumber, aubergine, courgette, melon, lettuce, watermelon and beans. This situation gets worse with certain companies specialised in an intensive cultivation. In a hypothetic crisis of the national and international

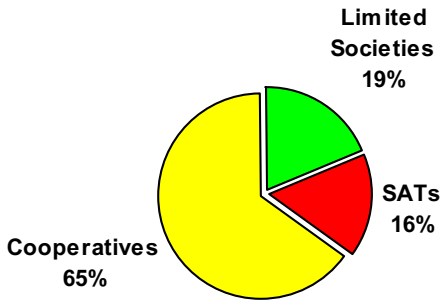
market of, for example, tomato, 92% of the social economy companies would be affected, reducing almost 30% of their invoices (De Pablo and Pérez Mesa, 2003).

The tomato commercialising sector is characterised by heterogeneous companies with different sizes. For example, we find one big cooperative working like an auction, several limited societies (auctions), as well as other social economy companies selling directly abroad[2]. In general, there hardly seem to be any initiatives to concentrate the sector to face the new challenges caused by a bigger offer and a demand that is reduced to a limited number of multinational groups. Figure 1 illustrates this: the relative size of the Almerian companies has not grown since the year 1998. In absolute terms, there has been an increase of volume: the most important company in both periods (Cooperativa Agraria San Isidro, CASI) sold 118.706 t in 1998, and 176.143 t in 2004 (both local and export). The figure 2 show the distribution by legal form for Almerian firms that sell tomato (export and national): the 81% are companies of social economy (cooperatives and Agrarian Transformation Societies).



Source: Own Elaboration

Figure 1. Accumulated marketing of tomato. Almerian companies



Source: Own elaboration with data of Association of fruit and vegetables commercialization of Almería (COEXPHAL).
SATs=Agrarian Transformation Societies.

Figure 2. Distribution by legal form of Almerian companies according to metric tons of tomato sold (national+ exports). Campaign 2004/2005

Almería with regard to the international competition

For Almería, the most important tomato buyers are (in order of volume): France, Germany, The Netherlands and The United Kingdom (table 2). The European Union (EU) absorbs the 95% of the fruit and vegetable production from Almería. In these countries, there obviously is an important competition with products from other origins, mainly from Holland and Belgium, as re-exporters of tomatoes from Almería[3].

Almería is the European tomato export area that is most affected by the progressive liberalization of the Moroccan tomato export towards the European Union[4]: destinies coincide (France, see table 2), as well as production calendars (table 4). This situation is discussed in the last report presented to the European Tomato Group[5] (Benloula, 2006). This report demonstrates that the coincidence of Almerian and Moroccan production causes important price reductions in both areas. Cioffi and dell'Aquila (2004) comment that the current system of entry prices in the European Union has automatically invoked a high quality standard. For Almería the dismantlement of this protection system and the entry of tomatoes with different quality standards would provoke an inevitable price fall[6], affecting heavily to the atomised sector with few resources to promote and to differentiate their products.

As a result of this situation, different Spanish public institutions defend the marketing of Moroccan tomatoes by Almerian firms. However, this is difficult since the majority of companies are cooperatives and therefore belong to the farmers. They will not be inclined to market Moroccan tomatoes instead of tomatoes cultivated by their own farmers who have capacity of vote inside the company. On the other hand, the auctions, as marketing organisations at origin, must defend their clients (farmers) against the foreign product. This situation does not mean that other kind of companies could not take advantage of this opportunity.

Nevertheless, table 3 shows that from Almería to the EU have grown in a higher proportion than is the case of the rest of competitors. Particularly, using the linear trend as an indicator, Almerian exports have been increasing by almost 19.500 t per year: the existence of a high R^2 indicates that this growth is constant, without unevenness. The second country in growth, according to the linear trend, is Holland (18.300 t per year). Morocco shows a trend of growth constrained by the quota, and a R^2 that indicates an irregular growth.

Table 2. Exports to EU and Imports of EU. Metric Tons. Average 2003-2004

	IMPORTS									
EXPORTS	**France**	**Belgium**	**Netherlands**	**Germany**	**Italy**	**U. K.**	**Spain**	**Sweden**	**Others UE**	**TOTAL**
Almería	99.996	16.135	46.998	94.267	17.317	33.616		8.527	50.068	**366.924**
Rest Spain	58.498	5.951	89.728	111.839	14.321	155.573	0	6.470	68.672	**511.053**
Netherlands	29.771	23.938		313.180	30.831	149.201	6.234	56.843	91.121	**701.119**
Morocco	165.616	1.303	1.126	22	2.774	150	8.529	73	12.414	**192.007**
Belgium	53.312		10.958	70.161	2.606	4.813	3.435	48	7.214	**152.547**
Italy	6.350	1.352	1.311	46.895		20.357	232	518	27.374	**104.389**
Germany	8.041	1.104	12.164		6.722	14.110	10.950	2.672	24.990	**80.753**
France		14.167	2.720	21.082	10.252	5.151	2.980	162	13.840	**70.354**
Others	13.519	2.984	11.196	7.792	597	9.052	67.914	3.642	29.782	**146.478**
TOTAL	**435.103**	**66.934**	**176.201**	**665.238**	**85.420**	**392.023**	**100.274**	**78.955**	**325.475**	**2.325.624**

Source: own elaboration with Eurostat and Spanish Customs data.

In table 4, we can appreciate how Almería has displaced, in February and March, the exports of all his competitors. There is, apparently, just one thread, the loss of competitiveness in May: the logical explanation of this phenomenon could be that it is in the month of May when the spring campaign ends, which may result in poorer qualities than during the rest of the year. What is especially alarming is the situation of other Spanish provinces because they lose quota all months in which their exports coincide with those from Almería or Morocco.

Table 3. Tomato Exports to EU. Metric Tons

Country	Average 1995-99	Average 2000-04	% Variation	(1)	R^2
Almería	197.489	286.256	45	19.473	0,94
Rest of Spain	608.456	602.995	-1	-1.991	0,02
Netherlands	542.913	631.659	16	18.326	0,52
Belg,-Luxbg	155.550	175.116	13	3.719	0,46
Italy	103.663	96.295	-7	-1.584	0,33
France	65.092	80.002	23	3.388	0,52
Morocco	160.681	168.978	5	4.041	0,36
Israel	8.466	13.563	60	973	0,78
Turkey	2.104	18.995	803	3.029	0,80
EU imports from intra	**1.693.258**	**1.946.136**	**15**	**52.496**	**0,81**
EU imports from extra	**175.118**	**214.203**	**22**	**9.766**	**0,82**

(1) "a" from Lineal trend 1995 to 2004 according to equation (y=ax+b)
Source: own elaboration with Eurostat and Spanish Customs data.

Table 4. Exports to EU for month. Metric Tons

	ALMERIA			REST OF SPAIN			NETHERLANDS			MOROCCO		
	2000	2004	% var	2000	2004	% var	2000	2004	% var	2000	2004	% var
Jan	39.922	61.977	**55**	82.081	78.032	**-5**	31.560	34.551	**9**	26.573	31.167	**17**
Feb	47.908	65.371	**36**	91.100	77.932	**-14**	33.536	23.685	**-29**	28.164	24.256	**-14**
Mar	34.940	62.926	**80**	93.480	75.202	**-20**	34.188	26.726	**-22**	24.715	31.026	**26**
Apr	24.574	49.319	**101**	58.924	49.685	**-16**	40.575	46.463	**15**	7.393	13.351	**81**
May	36.855	34.795	**-6**	65.057	43.147	**-34**	59.710	79.844	**34**	3.438	7.958	**131**
Jun	10.125	17.911	**77**	53.632	33.464	**-38**	75.373	87.219	**16**	256	2.484	**869**
Jul	3.215	2.587	**-20**	22.469	29.250	**30**	64.482	97.067	**51**	0	51	**-**
Aug	2.617	2.159	**-18**	10.717	16.748	**56**	72.862	91.811	**26**	0	0	**-**
Sep	3.218	3.236	**1**	16.404	23.710	**45**	54.394	74.313	**37**	0	0	**-**
Oct	4.679	6.707	**43**	32.347	27.760	**-14**	53.762	62.293	**16**	4.903	3.998	**-18**
Nov	11.870	19.393	**63**	59.580	37.249	**-37**	45.617	55.076	**21**	16.047	27.273	**70**
Dec	27.797	48.539	**75**	70.447	38.875	**-45**	37.150	44.327	**19**	29.323	39.830	**36**
TOTAL	**249.720**	**376.924**	**51**	**656.237**	**531.053**	**-19**	**605.207**	**725.379**	**20**	**142.812**	**183.399**	**28**

Source: own elaboration with Eurostat and Spanish Customs data.

A model of tomato exports

In this section we make a function to explain what variables may have influence in the tomato trade of Almería (Spain). A study of agrarian export functions is Chebil and Briz (2000), that use: regressors of Spanish vegetable exports, variables of competitiveness like the Spanish price in comparison with the EU price, as well as, variables of rent, and a variable of domestic demand (production + exports - imports). Tambi (1999) took one variable of total production in its export function of cacao and coffee and used, in addition, two variables of domestic and export prices. Murúa and Araiztegui (1994) prefer to use production variation like an exogenous variable in the model jointly with the domestic and international prices (in this case for almonds)[7]. To see one similar export function for tomato, with weekly data, see also De Pablo and Pérez Mesa *op. cit.* (2004).

We have data from January 1999 to October 2005, but I prefer to omit the data for July, August and September because that period is of no importance to exports from Almería and Morocco[8]. The nine variables used are (see description in table 5):

- CA_t= monthly production of Almería.
- XA_t= monthly Almerian exports to the EU. Spanish customs data.
- XRS_t= rest of monthly Spanish exports to the EU. Spanish customs data.
- XM_t= monthly Moroccan exports to the EU. Eurostat data.
- XH_t= monthly Dutch exports to the EU. Eurostat data.
- PA_t= monthly Almerian prices of exports (FOB).Calculated on the basis of Spanish customs data.
- PRS_t= rest of monthly Spanish prices of exports (FOB).Calculated on the basis of Spanish customs data.
- PM_t= monthly Moroccan exports (FOB).Calculated on the basis of Eurostat data.
- PH_t= monthly Dutch exports (FOB).Calculated on the basis of Eurostat data.

Table 5. Description of variables

	Metric Tons					Euros/100 kg			
	CAt	**XAt**	**XRSt**	**XMt**	**XHt**	**PAt**	**PRSt**	**PMt**	**PHt**
Average	**54.235**	**32.598**	**59.627**	**20750**	**46.079**	**77**	**105**	**74**	**129**
Max	96.082	63.350	95.660	47.430	90.267	149	177	159	212
Min	6.451	4.347	22.447	256	23.063	45	52	27	87
Range	89.631	59.002	73.212	47.174	67.203	104	126	133	125
S. Desv.	24.577	16.643	20.389	13.969	17.906	22	27	22	23

Source: own elaboration.

Note from the table 5, that the average of Moroccan export prices is similar to the average of Almería (only 3 cents of Euro less), and lower than the rest of Spain and Holland. The existence of familiar labour in Almería (not remunerated directly) makes

the difference with regard to the rest of areas, allowing to Almería to be competitive in prices. Analyzing the linear trends of the prices series, we see that all of them are positive: PRS_t grows 0,48 Euros per month; PA_t grows 0,35 Euros per month; Morocco and Holland grow, respectively, 0,22 and 0,15 euros per month. The low prices trend of Morocco could be due to this country's efforts to make use of its comparative advantage in costs selling lower than the remaining areas. The trends of prices don't mean that the sector is in good condition, but there is an increase of marketing costs passed on to the customer.

Table 6. Correlations among variables

	CA_t	XRS_t	XM_t	XH_t	PA_t	PRS_t	PM_t	PH_t
XA_t	0,958	0,649	0,459	-0,531	-0,117	0,421	0,019	0,216
CAL_t		0,652	0,436	-0,475	-0,099	0,408	0,002	0,197
XRS_t			0,421	-0,650	-0,067	0,068	-0,088	0,133
XM_t				-0,803	0,370	0,586	0,278	0,504
XH_t					-0,233	-0,373	-0,042	-0,437
PA_t						0,496	0,543	0,682
PRS_t							0,662	0,756
PM_t								0,595

Source: own elaboration.

Analysing the average of prices variations (positive[9] and negative), we see that Morocco has the highest positive and negative variations (respectively 0,29 and -0,24). For Almería it is $V^+ = 0{,}24$ and $V^- = -0{,}20$; the rest of Spain is situated in an intermediate position ($V^+ = 0{,}17$; $V^- = -0{,}18$); The Netherlands is the place with lowest average of variation ($V^+ = 0{,}14$; $V^- = -0{,}13$). What does this value stand for? Level of risk (the highest for Morocco and the lowest for The Netherlands); utilization of price as variable of competitiveness (maximum use for Morocco and minimum for The Netherlands); or even the perceived quality for customers (the lowest for Morocco and the highest for The Netherlands).

Table 7. Augmented Dickey-Fuller (ADF). Lagged differences=1

	(1)	(2)	(3)	▲(1)	▲ (2)	▲ (3)
XA_t	-5,847	-5,862	-0,478*	-6,325	-6,294	-8,555
CA_t	-5,031	-5,049	-0,508*	-5,855	-5,800	-5,896
XRS_t	-3,692	-4,383	-0,322*	-5,574	-5,550	-5,610
XM_t	-5,587	-5,611	-0,553*	-5,647	-5,596	-5,696
XH_t	-6,837	-6,921	0,099*	-5,648	-5,756	-5,707
PA_t	-4,497	-4,658	0,066*	-8,811	-8,777	-8,870
PRS_t	-4,264	-4,827	-0,345*	-6,173	-6,110	-6,229
PMt	-5,519	-5,594	-0,153*	-8,208	-8,139	-8,280
PH_t	-4,680	-4,685	-0,137*	-7,068	-7,022	-7,132

Source: own elaboration.
(*) Unit root (5%) according with MacKinnon critical values.
▲=1st difference.
(1) Intercept; (2) Intercept and trend; (3) None.

We use the Augmented Dickey-Fuller test (ADF) to study the stationary of the variables (if there are unit roots in them). Looking at the results, all variables have the same order of integration; only there is one unit roots when we don't use trend and intercept (table 7). Later we test if the residues of the estimated models haven't unit roots; and therefore, the variables are cointegrated[10].

Now, we estimate the following model (table 8):

$$XA_t = a + b_1 CA_t + b_2 XRS_t + b_3 XM_t + b_4 XH_t + b_5 PA_t + b_6 PRSt + b_7 PM_t + b_8 PH_t + e_t$$

We work with data in logarithms: the estimated coefficients are elasticities.

Table 8. Lineal models. Dependent variable = XA_t. Ordinary Least Squares

Variables	(1)	(2)	(3)	(4)	(5)
Intercept	5,120 (0,142)	3,499 (0,206)	4,133 (0,180)	-1,789 (0,520)	5,398 (0,108)
CAL_t	0,997 (0,000)	1,012 (0,000)	1,053 (0,000)	1,035 (0,000)	1,011 (0,000)
XRS_t	-0,044 (0,722)	-0,057 (0,590)	-0,073 (0,508)		-0,027 (0,823)
XM_t	-0,045 (0,303)		-0,036 (0,344)		-0,108 (0,033)
XH_t	-0,354 (0,026)	-0,255 (0,017)	-0,306 (0,036)		-0,330 (0,031)
PA_t	-0,247 (0,079)	-0,273 (0,047)		-0,231 (0,105)	-0,176 (0,201)
PRS_t	0,163 (0,488)			0,126 (0,530)	0,217 (0,339)
PM_t	0,104 (0,453)	0,122 (0,290)		-0,003 (0,976)	0,001 (0,993)
PH_t	-0,012 (0,964)	0,106 (0,658)		0,249 (0,357)	-0,089 (0,742)
D^{June}					-0,309 (0,022)
R^2 Adjusted	**0,921**	**0,922**	**0,925**	**0,915**	**0,928**
F-Stat	**89,396** (0,000)	**120,658** (0,000)	**174,890** (0,000)	**130,585** (0,000)	**86,985** (0,000)
Durb.-Watson	**2,081**	**2,094**	**2,307**	**2,145**	**2,140**
ADF(1)	**-6,337**	**-6,342**	**-6,546**	**5,782**	**-6,164**
ADF(2)	**-6,344**	**-6,322**	**-6,488**	**-5,789**	**-6,265**
ADF(3)	**-6,405**	**-6,408**	**-6,613**	**-5,840**	**-6,236**

ADF Augmented Dickey-Fuller with: (1) Intercept; (2) Intercept and trend; (3) None.
In Brakets p-ratio. Source: own elaboration.

Then, we will test other different specifications (model 2) to prevent possible effects of multicollinearity (table 6). Finally we try two new models: one using, with the production (CALt), the variables XMt, XRSt and XHt (model 3), and the other one using

only prices (model 4). With these 2 last models we try testing the hardiness of the coefficients. In the model 5, we include a dummy variable for the month of June because is the last final month for the campaign and the quality in this month is generally diferent. Also, we estimate models with lagged variables, but we don't obtain satisfactory results. Why don't we use other variable for the tomato exports from rest of EU countries? Because the monthly exported amounts from rest of countries are zero or practically zero.

First we think is important to consider the signs of the coefficients; the most relevant trends show that: an increase of exports from the rest of Spain, from Holland and Almería, diminish XA_t. On the other hand, an increase in prices of Morocco and the rest of Spain leads to an increase in tomato sent from Almería. Note that the sing of PH_t and XM_t coefficient changes depending on the particular model.

Nevertheless, note that only three variables are significant[11]: the local production, Dutch exports and the prices of Almerian tomato: the elasticity of all of them (except that of CAL_t that is unitary in several models) is below one; that means that variations in any of these variables will provoke increases or decreases less than proportional in

Table 9. Dependent variable = ΔXA_t. Ordinary Least Squares

Variables	**(3)**
Intercept	0,052 (0,107)
ΔCAL_t	0,913 (0,000)
ΔXRS_t	-0,253 (0,1000)
ΔXM_t	0,067 (0,187)
ΔXH_t	-0,393 (0,004)
ΔPA_t	-0,315 (0,015)
ΔPRS_t	0,064 (0,739)
ΔPM_t	0,151 (0,204)
ΔPH_t	-0,108 (0,718)
ECM_{t-1}	-1,069 (0,000)
R^2 Adjusted	**0,918**
F-Stat	**67,493** (0,000)
Durb.-Watson	**1,818**
ADF(1)	**-3,837**
ADF(2)	**-3,566**
ADF(3)	**-3,933**

ADF Augmented Dickey-Fuller with: (1) Intercept; (2) Intercept and trend; (3) None.
In Brakets p-ratio, Source: own elaboration.

XA_t. Particularly the elasticity <1 of PA_t induces to think that this variable is not so decisive in the relation offer-demand: it is logical to think that, at present, concepts as quality and service are very relevant for customers.

We estimate, to check the results, one Error Correction Model[12] (ECM) using the residues of the model (1), with one lag in, a dynamic model (table 9). The error-correction term is highly significant and of the correct sign. We can say that the variables are cointegrated: when KA_t is above its long-run forecast, there is a downward pressure on KA_t next period. Analysing the residues, we see that the behaviour is correct: there aren't unit roots at zero frequency according to Augmented Dickey-Fuller test (ADF).

In general, the results are very interesting: it show, for the first time, one statistical relation between the exports of the competing areas and the Almerian exports, being the first symptom of saturation in the European Union market. Particularly, Almería will have to pay attention to Holland (though, it is one of the principal customers of Almería) because it acts clearly as a competitor: the commercial capacity[13], of this country, to sell product of all origins, joined to the progressive increases of his autumn and winter crops, makes to Holland the principal competitor of Almería. With regard to Morocco, the system of quotas is continuously retarding its potential[14]; though it is logical to think that, in the next years, the relation of substitution with regard to the Almerian tomato will continue growing due to the decrease of the differential of perceived quality.

Conclusions

The marketing system of tomato in Almería is "atomised" and is very heterogeneous. This situation impedes any joint action that the sector should take. The most important step to maintain the position in the tomato market is the concentration of the offer at origin. The cooperative system is other factor that makes it difficult to take relevant decisions quickly. For example, concerning the selling of production from other origins (Morocco) or the creation of new marketing departments.

However, the situation of the marketing system of Almería with regard to their competition is good: over the last years. Almería has increased its sales to the EU more than other supplying zones (like The Netherlands, Morocco or the rest of Spain): the systems of quotas and entry prices for Moroccan tomatoes have favored it. Also, Almería has "defended" its quota of market in several months (February and March) opposite to Morocco and the rest of Spain.

Through the estimation of an econometric export function for Almería, we see that there are effects of substitution of the Almerian tomato for products from others origins, mostly from The Netherlands: it is important because The Netherlands is a customer of Almería and, at the same time, the most relevant competitor (using its commercial capacity to control the Almerian potential). At the other hand, we can also see that the price is not a decisive variable in the relation offer-demand (all elasticises calculated are inferior to one). The elasticity exports-production (close to one) show that Almería always exports the same proportion of its production (there isn´t a regulation for the export market when, for example, exist an over-produccion), this situation provoke that the export market was very unstable. The cointegration of the variables shows a strong relation among them and support the hypothesis of hard competition. To finish, this

paper tries to analyse the current situation, but is it likely that this changes in the near future? What will happen with the EU import protection system? [15] At present, the European Commission is studying the identification of several modes of application of the import systems of fruits and vegetables (prices of entry, quotas, etc.) with the aim to create a list of sensitive products. Undoubtedly, tomato is one of those products. Other important question is: What will happen with the tomatoes from Turkey? For Almería, the answer to this question will be very important at short term.

Notes

[1] To see the current situation of the retailers in Mediterranean Countries see Codron *et al.* (2004). One description of the food distribution and its incidencen on marketing horticultural horticultural co-operatives from Andalusia (Spain) see Galdeano (2003).

[2] The role of producer organisations in the supply chain of vegetables in Almería can be seen in Galdeano op. cit. (2003).

[3] For further information, see De Pablo and Pérez Mesa (2004, 2006).

[4] The Agree of association (year 2003) with Morocco has the following characteristics: Quota of 213 000 tons (campaign 2004/2005); Monthly permanent quota + additional quota Limited by a calendar from October to May. Price of conventional entry (reduced) of 46,1 €/100 kg of tomatoes. Due Ad valorem exempts. Out of this period, Morocco exports with a price of entry and a reduced due ad valorem (-60 %).

[5] The members of this group represent the most important associations of companies from Belgium, France, Spain, The Netherlands, Poland, and other. Usually, in the meetings there is a member of the European Commission.

[6] In other publication (see De Pablo, Perez Mesa and García, 2004, p 132), we have defended the existence of an asymmetric market (in Akerlof's sense, 1970) where the tomato is seen as a generic product and, therefore, the lower price sellers (with worse standards of quality) does damage to those who work better.

[7] Martinez-Zarzoso and Nowak-Lehmann (2004) show other approach, discussing how the Mercosur sectoral exports to the EU are explained by geographic distance, exchange rates and infrastructure. One traditional method was the implementing the popular Armington trade model: a consistent procedure of estimation can be seen in Davis and Kruse (1993).

[8] I could have included one dummy variable for period (July-October), but I prefer to directly omit the data. The data can be requested to the author for other research workers.

[9] Calculated for the formulaes : $P(.) = \text{Price}$; $S_i = \ln\left(\frac{P(.)_t}{P(.)_{t-1}}\right)$ being $V^+ = \sum_{i=1}^{n_1} \frac{S_i}{n_1}$ if $S_i > 0$ and $V^- = \sum_{i=1}^{n_2} \frac{S_i}{n_2}$ if $S_i \leq 0$

[10] If a model has non-stationary variables, it is possible that the residual are not either; therefore the least squares estimates will provide slanted estimators and the estimated model could be spurious. However if we can find stationary relations between vari-

ables that are not (cointegration), thus obtaining a long term balance with robust relationships: for one description of the limitations of this analysis see Guisán (2001).

[11] Theses results will be relative because these regressions are cointegrating regressions and the t-statistics will not be reliable guides to the inclusion of variables (Engel et al. 1989).

[12] See Engel and Granger (1987), and Hallam and Zanoli (1993).

[13] Wijnands (2003) describes the advantage of the Netherlands as the "performance and effectiveness of supply-chain".

[14] You can see the evolution of trade preferences for tomato exports from Morocco in Chemnitz and Grethe (2005). The evolution of the Euro-Med Association Agreements for the Mediterranean Partner Countries is analysed by Grethe et. al. 2005.

[15] An interesting works about the perspectives for the sector of fruits and vegetables is Cook (2003).

References

Akerlof, G. A. (1970). The market of lemons. Qualitative uncertainty and the market mechanism, Quarterly Journal of Economics, 84: 488-500.

Beaulieu, J. J. and Miron, J.A. (1993). Seasonal unit roots in aggregate U.S. data. Journal of Econometrics, 55: 305-328.

Benloula, S. (2006). Importations des tomates fraîches du Maroc sur le marché de l'Union européenne, Institut National d'Horticulture, École Nationale d'Ingénieurs de l'Horticulture et du Paysage (Angers).

Chebil, A. and Briz, J. (2000). Función de exportación hortícola española. Rev. Econ. ICE., 788: 79-85.

Chemnitz, C. and H. Grethe (2005). EU Trade Preferences for Moroccan Tomato Exports – Who benefits? Contributed paper at the XIth Congress of the European Association of Agricultural Economists "The Future of Rural Europe in the Global Agri-Food System", Copenhagen, 24-27 August, http://www.eaae2005.dk/CONTRIBUTED_PAPERS/ S8_618_Grethe&Chemnitz.pdf.

Cioffi, A. and Dell´Aquila, C. (2004). The effects of trade policies for fresh fruit and vegetables of the European Union, Food Policy, 29: 169-185.

Codron, J. M., Bouhsina, Z., Fort, F., Coudel, E. and Puech, A. (2004): Supermarkets in Low-income Mediterranean Countries: Impacts on Horticulture Systems". Development Policy Review, 22: 587-602.

Cook, R. L. (2003). The evolving Global Marketplace for fruits and Vegetables. Agricultural Issues Center and Departament of Agricultural and Resource Economics, University of California Davis.

Cortes Pérez, R. (1989): El comercio exterior del tomate. Ed FEPEX, Madrid, 437 p.

Davis, G. and Kruso, N.C. (1993): "Consistent estimation of Armington Demand Models" American Journal of Agricultural Economics, 75 (August): 719-723.

De Pablo, J. and Pérez Mesa, J.C. (2004): The competitiveness of Spanish tomato exports in the European Union, Spanish Journal of Agricultural Research, 2(2): 167-180.

De Pablo, J., Pérez Mesa, J.C. and García, R. (2004): Caracterización de la comercialización hortofrutícola española: una aplicación a la producción intensiva, Ed Thomson-Civitas, Madrid, 263 p.

Engle, R.; Granger, C. (1987). Cointegration and error correction: Representation, estimation and testing, Econometrica, 55: 251-276.

Engel, R.F.; Granger, C. W. J.; Hallman, J.J. (1989): Merging Short-and Long-Run Forecast: an application of Seasonal Cointegration to Monthly Electricity Sales Forecasting. Journal of Econometrics, 40, pp 45-62.

Galdeano, E. (2003): The Role of Co-operatives in the Competitiveness of the Horticultural Sector, Journal of Co-operative Studies, 36 (3): 190-213.

Grethe, H., Nolte, S. and S. Tangermann (2005). Evolution, Current State and Future of EU Trade Preferences for Agricultural Products from North-African and Near-East Countries. Journal of International Agricultural Trade and Development, 2 (1): 109-133.

Guisán, M. (2001): Causality and cointegration between consumption and GDP in 25 OECD countries: limitations of the cointegration approach, Applied Econometric and International Development 1(1).

Hallam, D. and Zanoli, R. (1993) Error correction and agricultural supply response, European Review of Agricultural Economics, 20: 151-66.

Martinez- Zarzoso, I. and F. Nowak-Lehmann (2004). Economic and Georgraphical Distance: Explaining Mercosur Sectoral Exports to the EU. Open Economic Review 15: 297-314.

Murúa J. and Araiztegui, A. (1994). Exportaciones de almendra: Análisis de calendarios y demanda, Revista Española de Economía Agraria, 170:145-173.

Pérez Mesa, J.C. and De Pablo, J. (2006). Análisis del balance comercio-consumo de tomate en la Unión Europea, mediante la construcción de una tabla input-output, Rev. Comercio Exterior, 3 (56): 195-203.

Tambi, E. (1999). Co-integration and error correction modelling of agricultural export supply in Cameroon, Journal of Agricultural Economics 20: 57-67.

Wijnands, J. (2003): The international Competitiveness of Fresh Tomatoes, Peppers and Cucumbers, Proceedings of the International Congress on Greenhouses Vegetables: The product Chain of Fresh Tomatoes, Peppers, Cucumbers. 31 Oct-1 Nov, Amsterdam, The Netherlands.