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

## Juan Carlos Pérez Mesa[*]

## 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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[*]  Corresponding Address: Universidad de Almería, Dpto. de Dirección y Gestión de Empresas, Cañada de San Urbano s/n, 04120 Almería (España)
    Telf. 0034950015742, Fax 0034950015472, Email: juancarl@ual.es

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** |

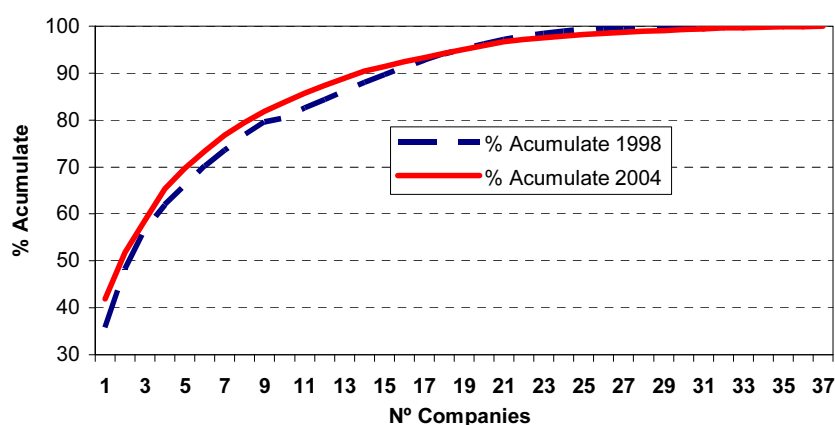Source: Own elaboration with customs data.

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
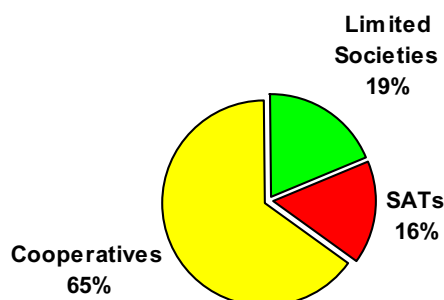


Source: Own elaboration with data of Association of fruit and vegetables commercialization of Almería (COEXPHAL).

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

| EXPORTS | IMPORTS | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| | France | Belgium | Netherlands | Germany | Italy | U. K. | Spain | Sweden | Others UE | |
| **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):

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

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 ($CAL_t$), the variables $XM_t$, $XRS_t$ and $XH_t$ (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 = $\Delta XA_t$. Ordinary Least Squares

| Variables | (3) |
|---|---|
| **Intercept** | 0,052 (0,107) |
| $\Delta CAL_t$ | 0,913 (0,000) |
| $\Delta XRS_t$ | -0,253 (0,1000) |
| $\Delta XM_t$ | 0,067 (0,187) |
| $\Delta XH_t$ | -0,393 (0,004) |
| $\Delta PA_t$ | -0,315 (0,015) |
| $\Delta PRS_t$ | 0,064 (0,739) |
| $\Delta PM_t$ | 0,151 (0,204) |
| $\Delta PH_t$ | -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 : $P(.) = \text{Price};$   $S_i = \ln\left(\dfrac{P(.)_t}{P(.)_{t-1}}\right)$   being   $V^+ = \sum_{i=1}^{n_1} \dfrac{S_i}{n_1}$

   if $S_i > 0$ and $V^- = \sum_{i=1}^{n_2} \dfrac{S_i}{n_2}$ 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).

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