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in

Mattas K. (ed.), Tsakiridou E. (ed.).
Food quality products in the advent of the 21st century: production, demand and public policy

Chania : CIHEAM
Cahiers Options Méditerranéennes; n. 64

2005
pages 103-113

The Effect of Quality-Environmental Investment on Horticultural Firms' Competitiveness

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Abstract. The aim of this paper is to analyse the impact that environmental respectful practices and total management quality improvements have on the firm's competitiveness (profitability and market share) within the fresh fruit and vegetable sector. Andalusian producing-marketing entities (Producer Organisations) serve as a reference for our analysis. For these entities there are subsidy programmes aimed at developing quality and environmental practices. Such programmes are a top priority for the CAP's Common Market Organisations. An analysis of a simultaneous equations model is suggested considering the distinguishing effect of investment in quality-environment and the possible endogeneity problems among the variables. The results show a positive correlation between the application of the aforementioned activities and the competitiveness of the horticultural firms.

Keywords: Environmental practices, quality, competitiveness, horticultural firms, profitability, market share.

1. Introduction

The production and marketing of high quality agricultural produce have become decisive factors for the competitiveness of firms within the European food market and, in a wider context, for all developed countries (Estruch, 1994)[1]. In this sense quality is considered as nutritional value, presentation, health guarantee and increasingly environment-friendly production.

The Andalusian sector of fruit and vegetables for fresh consumption in the European Union (EU) is no exception. The Common Agricultural Policy -CAP- (by means of the Common Market Organisation [CMO] since 1996) has been insisting on environment-friendly practices and greater quality control, since they are considered key factors for the development of this sector, for which the CAP has laid down a specific subsidy program.

Nevertheless, the voluntary character of this agricultural and environmental policy, the CAP's scope and the heterogeneity thus far of activities and types of practice (standardization and certification systems)[2] imply that each firm often acts in a different manner to its competitors

[1] Recent analyses within the European Union (EU) show greater diversification of demand due to a larger number of products for consumption. These products differ not so much in terms of nutritional composition, but due to the introduction of components related to health and other values added to the product, which are increasingly linked to quality-environment factors.

[2] In countries with traditionally protectionist and interventionist agricultural policies, as in many developed countries, the aim of achieving integration between agricultural policy and environmental policy reduces the economic instruments to two general types: *incentives schemes* and *cross-compliance*. Thus, in the United States conservation policy has been developed through the cross-compliance system with subsidies that are calculated by means of auctions, in which farmers offer the performance of their conservation plans and the administration assigns aid to the most efficient ones. The European Union has chosen the other procedure, based on voluntary practices (Sumpsi *et al.*, 1997).

within the sector. The practices adopted generally depend on the individual demands of the customers of each producing firm, especially those marked out by the large distribution chains.

In view of this situation in the fresh fruit and vegetable sector, where a minimum value added prevails (if compared, for example, to manufactured products), it is understandable that quality and environment-friendly production are put into practice not only due to the existing incentive programmes, but also as they are considered elements of distinction in the market. Therefore, this paper aims to determine the relationship between the aforementioned factors and other competitiveness variables such as profitability and market share.

This kind of relationship is based on the SCP hypothesis (structure-conduct-performance) which originated in the "Chicago School". Many of the analyses made in this line demonstrate how market share is the main determinant of a firm's profitability (or price-cost margins), which supports the "efficiency hypothesis". Therefore, although these variables are traditionally linked to the market concentration in a given sector[3], results show that those firms with a higher market share benefit more from said concentration than those with less share, so that their effect on profitability margins also depends on the structure of the industry or sector (Demsetz, 1973; Gale and Branch, 1982, among others). Moreover, we have seen that some results show the advantages of product differentiation to determine profitability, i.e. "market power hypothesis", but they also determine the positive effects of this differentiation on the market share in a different context of a firm's concentration (Clarke *et al.*, 1984; Martin, 1993).

As regards the food market, different studies (Pagoulatos and Sorensen, 1981; Zellner, 1989; and Cotterill and Clement, 1993, among others), also associate profitability and market share positively. Furthermore, other analyses within this food market establish the relationship between the aforementioned variables and the differentiation strategies of the product, showing the importance that the latter may also have, although once again results depend on the market concentration level (Vlachvei and Oustapassidis, 1998; Oustapassidis *et al.*, 2000). Overall empirical evidence points to complementarity between efficiency and market power, although the dependence level varies according to the structure of the industry.

From the analytical point of view, the latest reference studies assume the existence of endogeneity among the competitiveness variables (leading to the estimation of simultaneous equations). This paper takes this viewpoint into account, although the novelty lies in considering expenditure on quality-environment as a differentiation factor (as opposed to the traditional expenditure on advertising), given the features of the production and marketing of fruits and vegetables for fresh consumption (very low value added, homogeneous product and reduced expenditure on advertising).

A sample of Andalusian firms (Organisations of Producers of Fruits and Vegetables, OPFV)[4] is taken as reference. The analysis period is 1997-2001, in which environmental and quality improvement activities have been intensified through the so-called Operative Programmes (OP) with the establishment of subsidies according to the EC Regulation 2200/96.

Considering the aforementioned, this paper reviews, firstly, the development of different activities, denominated for practical reasons quality-environment activities, with reference also to their integration in the OPs of Andalusian horticultural firms. The third section specifies the equations to be considered and how the variables relate to each other. The results obtained

[3] The study of Clarke *et al.* (1984), among others, determines how the price-cost margins increase with a greater level of concentration in the industry.

[4] The main aim of these cooperative or associative entities is to handle and market the produce of their partners, the producers, thus linking productive and commercial activity, while at the same time providing better planning and concentration of offer.

through the methods of simultaneous estimation are depicted in the following section. Finally, the different conclusions are discussed.

2. Sample of firms: Activities in quality-environment related to Operative Programmes in Andalusia

The relevance of the fruit and vegetable sector in total agricultural production in both Spain and the EU (see Appendix, Table A.1), together with current demand, has been the reason behind the greater attention paid to quality management. At the same time, production and handling techniques are being revised in order to make them more environment-friendly. Thus, the current CAP includes quality environment activities among its main aims with the purpose of improving efficiency and competitiveness within the food market in general.

The Operative Programmes were established in EC Regulation 2200/96 in order to encourage producers' associations to adopt quality-environment practices. These OPs are financed 50% by European Community aid (the Agricultural Guidance and Guarantee Fund), while the other 50% is contributed by the OPFV's associates.

We take as reference the OPs in the Andalusian region, where the horticultural production represents 24% of national total[5]. The study of this horticultural sector allows us to work with a more homogeneous[6] sample of firms (OPFVs). Table 1 presents the total investment in these Programmes in Andalusia.

Table 1. Summary of the Operative Programmes 1997-2001

Year	No. Entities	Sales value (euros)	Operative Programme (OP)	OP over Sales (%)
1997	56	535,018,260	30,602,081	5.72
1998	56	691,268,612	38,171,625	5.52
1999	104	935,418,843	71,570,998	7.65
2000	101	1,042,741,155	82,933,023	7.96
2001	110	1,156,200,116	93,767,831	8.11

Source: Andalusian Council of Agriculture and Fisheries

As some of these investments do not have immediate effects, we have considered the group of firms which presented OPs in 1997 and in the following years. This approach provides the maximum amount of historical data, allowing for the analysis over at least five seasons. Of the 56 OPFVs that presented OPs in each of the five years under study, we have only been able to obtain data from 51 entities based on surveys and annual financial reports. This sample represents 58% of Andalusian horticultural marketing firms[7].

[5] Fruit and vegetables in Andalusia represent over 40% of total agricultural production (see Appendix, Table A.1), of which nearly 50% is exported. The main destinations are the European markets, accounting for over 90% of exports (Andalusian Council of Agriculture and Fisheries, 2001).

[6] Generally, the data used belong to firms whose intensive production and marketing systems are very similar. In many cases they have common clients, mainly represented by distribution chains and large EU importers.

[7] These entities, as already mentioned, are of similar operational characteristics and size (number of employees ranging from 110 to 315).

As a previous analysis, the evolution of the business efficiency and profitability indicators are first presented in Figure 1, in order to determine possible seasonal differences prior to the start of investment in the activities of the OPs. There had been access to income figures from 1994 to 1996 and for the studied seasons 1997 to 2001.

The indicators considered are as follows:

- Value added (VA), obtained from the gross value added.
- Sales margin (SM), evaluated as the ratio between profit before interest and taxes (PBIT) and gross sales.
- Economic profitability (P), obtained from the relation between the PBIT and the total assets.

The three variables are given in euros (corrected for inflation).

The evolution of said indicators is generally very similar: a decrease in profitability can be observed which has been characteristic in this sector during the 90s (Galdeano, 2000), but there is a certain recovery and a change in the tendency from 1998 onwards.

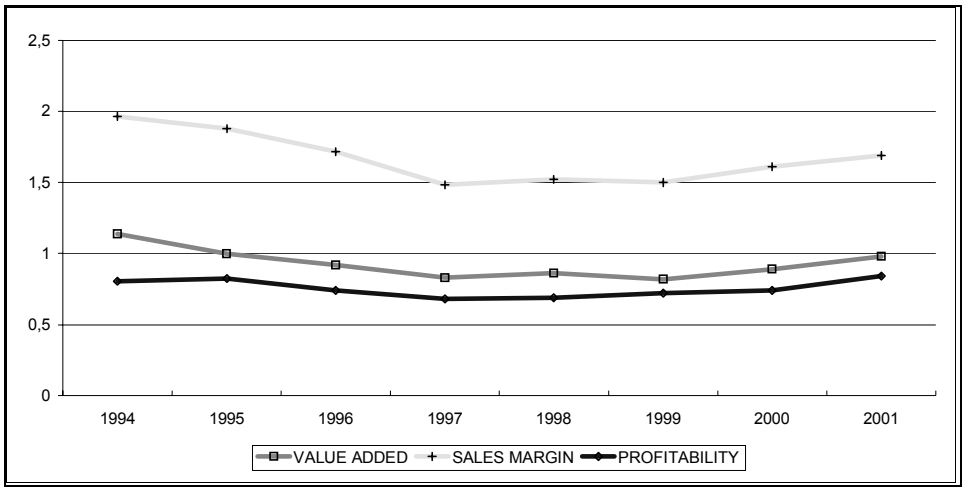

Figure 1. Evolution of economic indicators.
VA: values divided by 100 in the graph. P: values divided by 10 in the graph.
Source: Galdeano and Céspedes (2001).

The recovery of profitability coincides with the process of generalized intensification of quality-environmental practices within the studied sector. An a *priori* relationship can therefore be deduced between these practices and profitability. Nevertheless, it has also been determined that in many cases these positive effects are not enough at present to compensate for the cost of said investments (Galdeano, 2000; Galdeano and Céspedes, 2001). These assessments lead to the consideration of other incentives for such practices, such as increasing, or at least maintaining, market share (given the requirements of current demand), or maintaining the competitive position of these horticultural firms within the food system.

3. Variables and model specification

As expounded in section 1, the SCP hypothesis relates profitability margins to efficiency (considering the sales quota of the sector as the main variable), and also to market power

(measured basically in terms of product differentiation); both relationships are usually linked to market concentration. Likewise, within the food market multiple studies along similar lines relate the effects among the aforementioned variables, generally concluding that the influence of market share and product differentiation on profitability are correlated (Pagoulatos and Sorensen, 1981; Cotterill and Clement, 1993; and Vlachvei and Oustapassidis, 1998, among others). In other words, the empirical results point out that theories of efficiency and market power are complementary rather than alternative. The positive connection of both to the concentration level (especially due to the utility of economies of scale) is also analysed, although the results regarding price-cost margins may be different in many cases, depending on the structure of sector or industry.

The dependence among the different competitiveness variables implies the application of simultaneous analyses, taking into account endogeneity.

In many sectors the differentiation strategy is calculated by means of the firms' promotion and advertising. However, investment in this variable is of less relevance in the horticultural sector and the agricultural sector in general. As already mentioned, in recent years product differentiation has been based on factors concerning environment-friendly practices and improvements in product quality. This is also due to the product's homogenous character and the reduced added value in the marketing of fresh food.

This analysis will focus especially on determining the effect of such differentiation on the firm's profitability and market share, taking as reference Andalusian OPFVs. Thus, along the same lines as the cited studies, the following system of three equations was put forward:

$$SM_{it} = f1\ (MS_{it}, QE_{it}, X1_{it}) \quad (1)$$

$$MS_{it} = f2\ (SM_{it}, QE_{it}, X2_{it}) \quad (2)$$

Where:

SM_{it} = Sales margin (PBIT/Sales)[8] of firm i in year t.

MS_{it} = Market share of firm i over period t, calculated as the sales ratio against the total sales of the firms considered in the sample.

QE_{it} = Investment in quality management and environment-friendly practices as a percentage of sales of firm i in year t.

X1, X2, X3 = The vectors of exogenous variables.

t = 1997, ... 2001.

3.1 Profitability equation

Following Mueller (1986), the profitability function (Π_{it}) in the presence of differentiation is stated as follows: $\Pi_i/S_i = 1/\eta\ [(m_i/\sigma) - \theta m_i + \theta]$, where S_i are the sales, m_i is the market share, η is the industry demand elasticity, σ is the degree of substitutability of one firm's product for the product of another firm ($0 < \sigma < 1$), and θ is the degree of cooperation, which is a function of the concentration ratio in the sector. On the basis of the aforementioned variables, in this model the profitability indicator (SM) will be estimated following this equation:

$$SM_{it} = a + b\ MS_{it} + c\ QE_{it} + d\ KS_{it} + e\ CI_{st} + f\ SG_{st} + g\ IM_{st} + u_{it} \quad (4)$$

[8] We use this profitability indicator because it is normally used as a proxy for the price-cost margins (see Uri, 1998; Schmalensee and Willig, 1992; Molyneux and Forbes, 1995).

Where MS_{it} and QEit are the previously defined variables of market share and of quality-environment costs, respectively (the latter revealing the degree of substitutability among the products of the sector). KS_{it} is the fixed gross assets (physical capital stock) over sales of firm i in year t, introduced as the scale indicator of the firm (and also reflecting other factors associated with efficiency). CI_{st} is the concentration ratio of the sector, obtained from the Hirschman-Herfindahl ratio[9]. SG_{st} is the growth indicator of the sector (reflecting changes in demand), calculated as the ratio of total sales of the sample in a given year divided by the previous year's sales. IM_{st} represents the imports of horticultural products within the European Union[10] (a factor therefore of demand), measured as the ratio of purchases in the EU from other European regions and third countries over the sales of the group of firms included in the sample for a given year. The error term is represented by u.

The introduction of the different explanatory variables in equation (4) is due to the following: different empirical studies (Revenscraft, 1983; Scott and Pascoe, 1986; and Vlachvei and Oustapassidis, 1998, among others) directly associate the firm's profitability ($b > 0$), represented in our case by SM, with the market share (MS) and the concentration ratio (CI), which is a (positive) determinant of profitability ($e > 0$). Also, the degree of differentiation (in this case QE) has an effect on demand elasticity and determines the market structure, so that greater investment in QE implies expectations of higher profitability ($c > 0$); likewise, the capital factor (KS) has traditionally contributed to higher profitability ($d > 0$). The growth ratio of the sector (SG) is included in order to reflect changes in demand characteristics; an increase in CS will have a positive effect on the firm's profitability ($f > 0$). As for the IM variable, it is inversely related to the profitability indicator ($g < 0$).

3.2 Market share equation

In accordance with previous studies such as that carried out by Martin (1993), the model to estimate the firm's share within the sector is specified as follows:

$$MS_{it} = h + i\ QE_{it} + j\ SM_{it} + k\ KS_{it} + l\ G_{it} + m\ SG_{st} + n\ IM_{st} + v_{it} \quad (5)$$

Where G_{it}, which was not previously described, has been included as an explanatory variable, standing for the growth ratio of firm i in year t, obtained as the ratio between total sales of a given year and the previous year's sales. The error term is represented by v.

According to Martin (1993) or Vlachvei and Oustapassidis (1998), the market share variable is positively related to product differentiation (QE), which leads to higher MS ($i > 0$) and SM ($j > 0$); a higher capital ratio over sales (KS) means a more efficient use of real capital and the utility of scale economies ($k > 0$). Likewise, higher growth of the firm (G) affects the market share positively ($l > 0$); nevertheless, an increase in the sector or industry (SG) may have a negative

[9] This ratio is obtained from the square sum of all firms' market share as follows:

$$H = \sum_{i=1}^{n} (S_i/S)^2 = \sum_{i=1}^{n} MS_i^2$$

Where:

Si = sales of the firm I

S = total sales of the firms in the sample

MS = market share of the firm defined previously.

[10] We consider this macroeconomic indicator because the purchase within the European Union of fresh fruit and vegetables from other countries and other European regions has increased considerably in the last decade. Despite the fact that the reference firms are renowned for the production and marketing of very early products with little competition, it is possible that vegetables such as tomatoes from North African countries are having an influence on variations of profitability or market share of the studied firms. We have taken into account trade within the EU, as this market constitutes almost 95% of these firms' sales. Data are drawn from the marketing yearbooks of the FAO (Food and Agriculture Organization).

effect on MS ($m < 0$) due to greater entry opportunities for other firms. Finally, the increase in IM tends to reduce the individual share of the firms in the sector ($n < 0$).

3.3 Equation regarding investment in quality-environmental practices

We do not have at our disposal any reference study where an equation is formulated to estimate the QE variable. However, since it will be used as the main variable for product differentiation, the Dorfman-Steiner formulation (1954) regarding optimal advertising costs has been considered and with this replacement the following equation has been derived: $Eqe_i/S_i = [(P_i-C_i)/P_i]\ e_{QE}$, where expenditure on quality-environment (Eqe) over sales (S) depends on the price-cost margin (P-C/P) or profitability indicator, and on eQE, which is the elasticity of the QE components in the demand function. Following this formulation, also applied to the studies conducted by Uri (1988) or Molyneux and Forbes (1995), where the distinguishing effects of specific variables are analysed and variables related to the industry structure are included, the equation to be estimated stands as follows:

$$QE_{it} = p + q\ SM_{it} + r\ MS_{it} + s\ CI_{it} + t\ SG_{st} + w_{it} \quad (6)$$

Where QE depends on the profitability indicator (SM), on the factors related to the elasticity of demand (gathered through SG), on efficiency (MS) and on the structure of the sector (as reflected in the concentration level CI). All of these variables have been defined in the previous equations. Finally the error term is included as w.

Regarding the most logical relationships in this equation (6), and in line with the findings of Uri (1988) or Oustapassdis *et al.* (2000), it was concluded that high market share (MS) and high profitability (SM) may contribute to greater investment in quality-environment ($q > 0$, $r > 0$). The concentration ratio (CI) is added to the model in order to ascertain whether differentiation is greater in a highly competitive market or vice versa. Finally, QE can be more effective for differentiation when the sector is growing ($t > 0$)[11].

Table A.2 in the appendix presents the descriptive statistics of the variables. Each variable is calculated in fixed euros by means of the Retail Price Index for fruit and vegetables.

4. Estimation and results

Having established the system of three equations, this section outlines the suitable method for simultaneous estimation, taking into account the problem of endogeneity among the variables.

Additionally, the fact that this study deals with panel data means that the unobservable individual efects should also be analysed. A frequent solution is to consider a model of common fixed effects for all the firms, and to treat the observations as a pool of data[12], as has been done in this case[13]. Four temporary dummy variables D1, D2, D3 and D4 are introduced for the possible temporary effects in the three stated equations (excluding from the estimation the temporary variable corresponding to the first period).

[11] When a market is growing, sales' increases due to differentiation do not completely occur at the expense of competitors. Nevertheless, in an expanding market, rival firms may take longer to detect sales' decreases due to the differentiation of other firms and their reactions may be delayed, if they react at all. This asymmetry in the timing and magnitude of the competitors' response implies that QE can be more effective within an expanding sector.

[12] This method has been applied by authors such as Oustapassidis and Vlachvei (1999) or Bottasso and Sembenelli (2000), among others. Thus, the obtained ratios will show the average effects for the whole sample among the different variables.

[13] The sectorial effect would not make sense in the present study and there is a certain homogeneity in the sample, as mentioned before.

Given the stated complementarity of the dependency among variables, the simultaneous estimation of equations (4), (5) and (6) is carried out using the method of *two-stage least-squares* (2SLS). This method allows for the creation of an auxiliary regression of the endogenous variables, included as explanatory ones (i.e. SM, MS and QE) in each equation where they appear. Each of these auxiliary regressions has one of the aforementioned endogenous variables, and all the predetermined variables from the model of simultaneous equations are present as explanatory variables[14].

Moreover, as the 2SLS method loses efficiency when correlations exist among the error terms of the different equations of the model, the estimation with the three-stage least-squares (3SLS) method[15] was also carried out.

The results of both estimations are presented in the following Tables 2 and 3.

Table 2. Results of the simultaneous estimation by 2SLS.

Variables	SM	MS	QE
Constant	2.24	1.82	2.03
	(3.15) ***	(2.24) **	(2.14) **
QE	0.39	0.21	
	(1.93)**	(2.15)**	
MS	0.05		0.17
	(1.87)*		(1.78)*
KS	0.68	0.64	
	(3.37)***	(2.07)**	
CI	-0.09		-1.04
	(-1,51)		(-1.25)
SG	0.19	0.74	1.08
	(0.60)	(0.52)	(2.17)**
SM		0.69	0.29
		(2.01)**	(1.87)*
G		0.51	
		(0.97)	
IM	-0.32	-0.07	
	(-1.09)	(-0.92)	
D1	0.17	0.12	
	(1.69)*	(0.89)	0.21
D2	0.20	0.39	(1.48)
	(1.74)*	(1.84)*	0.27
D3	0.53	0.46	(1.68) *
	(2.01) **	(1.85) *	0.18
D4	0.63	0.41	(1.84) *
	(2.38) **	(1.97) **	0.23
			(2.57) ***
R^2 (adjusted)	0.70	0.61	0.52
Observations	255	255	255

The values of the t-statistics are given in brackets.
***1% Significance level, ** 5% significance level, * 10% significance level.

[14] In a second stage, the predictions obtained from these auxiliary regressions are used in the heading equation instead of the endogenous variables that appear as explanatory variables; with this substitution it is estimated by *ordinary least-squares* (OLS). Thus the least-squares estimations of the second stage are the solutions to the system of normal equations. In other words, the 2SLS estimator is an estimator of instrumental variables that uses as instruments the vector constituted by the variables estimated through the auxiliary regression and the predetermined variables of the system. It is therefore a solid estimator (Novales, 1996).

[15] The 3SLS estimator is an estimator of now simultaneously instrumental variables for the whole system. The third stage is the estimation by generalized least-squares (GLS) of all the equations, which allows improved efficiency in the case of correlations among the error terms.

Table 3. Results of the simultaneous estimation by 3SLS.

Variables	SM	MS	QE
Constant	2.31	1.92	2.11
	(2.96) ***	(2.18) **	(2.16) **
QE	0.87	0.18	
	(4.03)***	(2.22)**	
MS	0.31		0.19
	(2.09)**		(1.79)*
KS	0.49	0.46	
	(2.67)***	(3.44)***	
CI	-0.25		-1.04
	(-1.41)		(-1.25)
SG	0.28	0.25	1.08
	(0.98)	(1.72)*	(1.91)*
SM		0.34	0.28
		(1.98)**	(3.29)***
G		0.51	
		(0.97)	
IM	-0.41	-0.09	
	(-1.38)	(-1.02)	
D1	0.08	0.14	
	(0.72)	(0.93)	0.17
D2	0.22	0.44	(1.32)
	(1.73)*	(1.92)*	0.23
D3	0.49	0.38	(1.67)*
	(1.97) **	(1.87) *	0.17
D4	0.56	0.35	(2.12) **
	(2.14) **	(1.99) **	0.20
			(2.62) ***
R2 (adjusted)	0.69	0.64	0.53
Observations	255	255	255

The values of the t-statistics are given in brackets.
***1% Significance level, ** 5% significance level, * 10% significance level.

The results of Tables 2 and 3 are quite similar. It cannot be said that greater efficiency is achieved with the estimation by means of 3SLS, which leads to a reduction in, or the complete absence of correlation between the error terms in the equation system. In both cases the results show the positive effect of product differentiation by means of QE on profitability (SM) and the firm's market share (MS). The capital factor (KS), also an indicator of the firm's scale, is directly related in both equations to the two dependent variables. Moreover, although its ratios are not significant, the concentration of the sector (CI) does not positively affect the firm's profitability (i.e. profitability and market power by means of QE[16]). It can also be seen that the growth of the sector (SG)[17] benefits the differentiation strategy of the firm (QE). The effect of imports (IM) appears to be negative, although its effect is not generally significant[18]. The temporary effects appear with a significant ratio in the last years, probably as a result of greater intensification of QE practices and an increase in profitability.

In short, the results obtained denote a positive impact of investment in QE practices on the variables determining the competitiveness of the OPFV in this study. This fact confirms the

[16] This would show that in this case the concentration does not imply a coordination or collusion effect on the market power of the firms in the sector.

[17] Market share is also affected positively, although the ratio is not significant.

[18] This may be a result of the increase in market share and the consolidation of the sector which has been observed in recent years (Galdeano, 2000).

differentiating effect of quality-environmental practices and their complementarity with profitability and market share.

5. Conclusions

The present study confirms the complementarity of the relationships among the variables which determine competitiveness (link between the efficiency hypothesis and the market power hypothesis) within the fresh fruit and vegetables sector. Due to the characteristics of horticultural firms, investment in quality-environmental practices currently represents a key factor for product differentiation. This is due to the increase in investment in these practices over recent years, as a result of the CAP's incentives by means of the OP, especially since 1997. More importantly, the positive impact of the quality-environment component on profitability indicators reveals a recovery of the different values and a tendency change, particularly in the sales margin and economic profitability.

As a result of this analysis through simultaneous estimations considering the dependence among the variables of the firm's competitiveness, a certain degree of complementarity of quality-environmental practices with profitability and market share has been found. On the whole, it has been observed that investment in these practices contributes to greater efficiency and market power by means of product differentiation with regard to competitors.

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Appendix

Table A.1. Fruit and vegetable share in the Final Agricultural Production.

ANDALUSIA	SPAIN	EUROPEAN UNION
42.5 %	48.4 %	39.3%

Source: Andalusian Council of Agriculture and Fisheries (2001).

Table A.2. Descriptive statistics of the variables: Equations (4), (5) and (6).

Variables	Average	Standard deviation	Minimum	Maximum	Observations (1997-2001)
SM	1.57	0.94	0.71	1.98	255
MS	0.06	0.04	0.01	0.17	255
QE	5.54	2.17	1.46	8.45	255
KS	0.11	0.05	0.02	0.29	255
G	1.12	0.14	0.67	1.41	255
SG	0.83	0.57	0.03	1.32	5*
CI	0.08	0.01	0.07	0.08	5*
IM	11.62	1.74	10.86	12.39	5*

*These are general rates of the sector and the same ratio is assigned to the all the firms during the same period.