Does Market Orientation in Small-Scale farms pay off?. A study of Innovation behaviour in Spanish agriculture

Natalia López-Mosquera[1], José María García Álvarez-Coque[2], Mercedes Sánchez[3]

[1] University of Extremadura (Spain)

[2] Universidad Politécnica de Valencia (Spain)

[3] Public University of Navarra (Spain)

Paper prepared for presentation at the EAAE 2014 Congress
'Agri-Food and Rural Innovations for Healthier Societies'

August 26 to 29, 2014
Ljubljana, Slovenia

Abstract

The paper underlines the importance of adopting a 'market-orientation' strategic approach in order to improve the performance of the firms, previously influenced by the 'adoption of innovations' of interest to the agricultural firms in two Spanish regions. The methodology selected has been a Multi-Group Structural Equation Modelling applied to the data obtained by personal interviews to a sample of farmers. Agricultural producers are more oriented, from the market point of view, to their regular customers and to controlling the quality of their production. The results also show a positive impact of market orientation activities on the performance to all firms.

Keywords: strategic decisions, market orientation, adoption of innovation, SEM multi-group analysis, firm performance.

1. Introduction

The volatile and complex environment in which firms operate leads them constantly to adjust their capabilities or to create new sources of value. To gain competitiveness, managers seek to improve business performance by identifying and adopting strategic approaches. A great deal of current research in marketing and management (Bigné et al., 2000; Zhou et al., 2005; Spillan and Parnell, 2006). However, some studies (Olavarrieta and Friedman, 2008; Baker and Sinkula, 2009; Cillo et al., 2010; Hakala, 2011) indicate that market orientation is not the only viable strategic orientation or approach, suggesting that other business strategies may also have considerable impact on competitive advantages and firms' performance. One of these alternatives is the innovation process. These actions can be considered complementary or not (Furtan and Sauer, 2008; Salavou and Avlonitis, 2008).

To fill a gap in recent studies, this paper underlines the importance of adopting 'market-orientation' strategic approach in order to improve the performance of the firms, previously influenced by the interest to adopt innovations. This study has three specific aims: (1) to determine, through Structural Equation Modelling (SEM) the influence of Market Orientation and innovation on firms' performance, 2) to analyse the inter-relationships between market orientation and adoption of innovations and its influence on firm's performance and 3) to study by SEM the differences of this firm's behaviour in two different geographical contexts. The study investigates a sample of firms drawn from the Spanish agricultural sector.

In the next pages, section two refers to the theoretical foundations of the relationships between market orientation, adoption of innovations and firms' performance. A third section follows, describing the variables used to measure the constructs, the empirical context and the data collection. Section four will describe the analysis performed and will report the main findings. A discussion will be developed in section five and the conclusions and limitations are presented in section six.

2. Theoretical framework

Following a resource-based approach (Wernerfelt, 1984 among others), agricultural businesses can obtain competitive advantages if they set up strategies to promote the development of their resources and capacities (Alarcón and Sánchez, 2013). Innovation is a key strategy in agriculture, including not only yield improvements but also new methods of managing resources, production processes and final services (Rama 2008;

Grunert et al., 1997; Traill and Meulenberg, 2002; Alfranca et al., 2004; Capitanio et al., 2009; Bayona et al., 2012).

Market orientation (MO) has been extensively researched during the last few decades. A significant number of definitions of market orientation have been put forward since the seminal definition and the behavioural and cultural approaches remain current. The behavioural approach proposed by Kohli and Jaworski's (1990) seminal work on MO and the cultural approach adopted by Narver and Slater (1990) and Slater and Narver (1994) afterwards are the two main theoretical frameworks that have most successfully guided the conceptualization of the MO. However, later studies (Deshpandé and Farley, 1998; Álvarez et al., 2000) successfully proved the hypothesis that a true market orientation, defined as a culture that commits the organization to the continuous creation of superior value for customers, takes place when there is a close relationship between behaviour and culture.

This paper explores the relationship between market orientation and adoption of innovation. The literature assumes that the market orientation is an antecedent of business actual innovation behaviour (Deshpande et al. 1993; Nassution et al, 2010). Thus, the model presented proposes a positive relationship between Market Orientation and adoption of innovation (H1 in Figure 1).

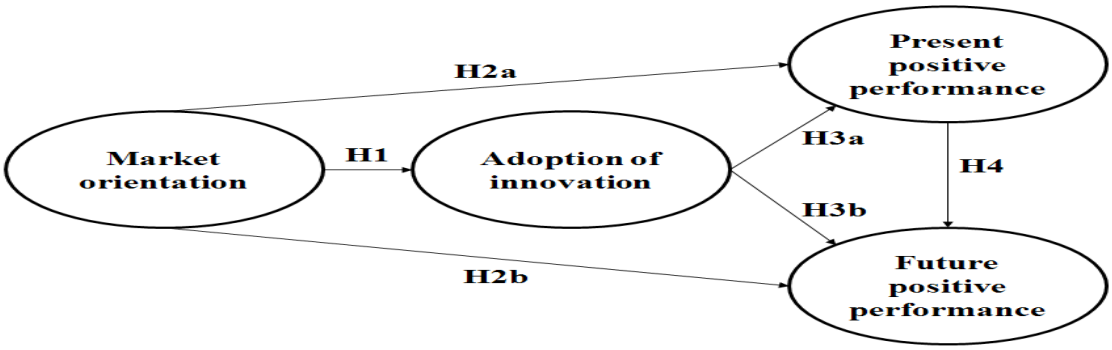
In any case, there are two schools of thought regarding the relationship between market orientation and innovation. One claims that market oriented firms show less propensity to innovate, preferring to focus on satisfying the needs expressed by their customers or imitating their competitors: an attitude that is unlikely to promote innovation. Most researchers, however, suggest a positive link between market orientation behaviour and innovation (Kohli and Jaworski, 1990; Calantone et al., 2002; Jaw et al., 2010), having shown that innovative processes flow naturally out of a market-oriented focus.

On the other hand, a number of empirical studies (Im et al., 2008; Jaw et al., 2010) have attempted to assess the link between market orientation and business performance, using various performance indicators. Common performance indicators are return on assets (ROA), return on equity (ROE), return on sales (ROS), market share, sales volume, profit over sales (profit turnover) and new product success rate. Although some studies suggest a negative or non-significant relationship (Harris, 2001) between market orientation and business performance, some evidences (Sin et al., 2005; Ellinger et al., 2008) suggest a positive relationship between the two. These contradictory results inspired and motivated the search for alternative ways measure the influence of market orientation on firm's performance. Based on the above considerations the Figure 1 shows the conceptual framework proposed in this paper. Initially, the Market Orientation can influence positively on present and future results of the firms (H2a and H2b).

Innovation is also a factor of business success or at least of business survival in a volatile environment. The managerial literature also reflects a broad agreement on innovation as a key driver in the economic performance of organizations and nations (Paladino, 2008). The theoretical relationship between innovation and performance, which could be expected a priori to be positive (H3a and H3b in Figure 1), is not supported in some empirical analyses. Though innovation can be key to survival (Li and Calantone, 1998; Schwartz, 2006) and simple innovations may result in performance gain, some authors don't find evidence of a clear relationship between innovation and added value (Furtan and Sauer, 2008, Koellinger, 2006). While innovation is suggested to have a positive impact on firm performance (Calantone et al., 2002; Deshpandé and Farley, 2004; Cillo et al., 2010), empirical evidence that proves the link between innovation capability and firm performance remains unconclusive (Mone et al., 1998).

Innovation is considered one of the most important factors for a firm to challenge major competitors in both national and international markets (Traill and Meulenberg, 2002; Bayona et al., 2013). The low R&D intensities observed in the agricultural sector (Capitanio et al., 2009) are likely due to the fact that innovation processes in the agri-food sector are supply-driven (Garcia and Burns, 1999). Another characteristic of agri-food sector behavior in this context is that innovations are incremental rather than radical (Galizzi and Venturini, 1996; Grunert et al., 1997). Nevertheless, decisions on the adoption of new technologies in agriculture are usually complex, involving both quantitative and qualitative objectives (social, sustainability, rural development, etc). Market failures arising from information asymmetry hamper the success of the adoption of innovation (Fortuin and Omta, 2007). Newly available technologies and increasing globalization of the agri-food sector may lead to it becoming a high R&D intensity sector when traditionally it has been classified as low R&D intensity sector (Filipalos et al., 2009). We hypothesise a positive relationship between adoption of innovations and actual and future firm's results (H3a and H3b). In addition, a positive interaction between present and future results of the firms is considered in the conceptual framework (H4).

Figure 1. Market orientation, adoption of innovation and present and future positive performance



3. Methodology

3.1. Procedure and initial characterization of the sample

Prior to the survey, a pilot study was carried out on a sample of 30 stakeholders related to the farming sector to ensure the validity and user-friendliness of the questionnaire. Once the pre-test was carried out, the survey was launched by two technical agricultural institutions (INTIA and IVIFA[1]) in two Spanish regions selected to the analysis, Comunidad Foral de Navarra and Comunidad Valenciana, by a random sampling to farm holders. Data were collected from May to December of 2012 in the form of face-to-face personal interviews. On average, respondents took 30-40 min to complete the oral questionnaires with the interviewers' assistance. The final total of usable questionnaires was 245, with 125 from Navarra and 120 from Valencia, and there were 5 refusals. On the basis of the final sample a typical farm holder would be a 50 year old man (Table 1).

Additionally, the product specialization changed from one region to the other, thus representing two different patterns of production. In Navarra, cereal, vegetables, ovine,

[1] Instituto Navarro de Tecnología e Infraestructuras Agroalimentarias (INTIA, S.A. www.intiasa.es) and Instituto Valenciano de Investigación y Formación Agroambiental (IVIFA, www.ivifa.es)

bovine and pig production were predominant. In Valencia, there was strong presence of citrus, fruits and vineyards, with significant presence of poultry or pig productions.

Table 1. Characterization of the sample

Variables	Navarre	Valencia	F^a/χ^{2b}
Age	46.43	47.80	1.08^a
Level of Education			13.63^{b***}
No regulated studies	4.8%	10.2%	
School Graduate	34.7%	51.7%	
High School Graduate	48.4%	33.1%	
University Degree	11.3%	5.1%	
Other	0.8%	0.0%	
Year of Production			8.28^b
Pre 1955	32.3%	28.0%	
1955-1960	3.2%	1.7%	
1961-1970	4.8%	11.9%	
1971-1985	18.5%	20.3%	
1986-2000	27.4%	27.1%	
2001-2005	7.3%	9.3%	
Post 2006	6.5%	1.7%	
Does not share in ownership of the holding	72.4%	65.8%	1.19^b
Membership in Cooperatives	35.7%	40.3%	2.39
Membership in other type of Tillage / Cattle-Raising Societies	73.8%	83.1%	11.25***
Percentage of time devoted to production	89%	93.6%	5.56**
Gross Margin			75.94***
Over 50,000 euro	5.7%	4.8%	
20,000-50,000 euro	16%	4%	
10,000-20,000 euro	23.4%	9.7%	
5,000-10,000 euro	33.2%	47.6%	
Below 5,000 euro	21.7%	33.9%	

3.2. Questionnaire and measures

The research questionnaire was compiled from multi-dimensional scales designed to capture the constructs of market orientation, adoption of innovations and actual or future positive economic results. Seven-point Likert scales (1=strongly disagree, 7=strongly agree) were used for all measurements; except for innovation adoption where dummies variables were employed: 0 for no adoption and 1 for adoption. Concretely, the scales employed were:

Market orientation. The study uses a 6-item scale based on MKTOR by Narver and Slater (1990), which measures firm holders' adaptation to their clients, their search for new clients and their interest in obtaining competitive advantage through the quality and price of their products.

Adoption of innovation. The scale used to measure the adoption of innovation in the last five years is based on Avermaete et al. (2004) paper. It consists of 3 items exploring issues such as introduction of new services, new production techniques or new economic activities in the firm.

Actual and future positive economic results. Present and future success results are measured through two 5-item unipolar scales, based on the works by Fortuin et al. (2007) and Jaw et al. (2010). The actual success scale results shows the current state and profitability of firms. The future results scale reflects owners' positive or negative outlook regarding the state and future profitability of their firms.

Table 2. Measurement model for Navarra and Valencia samples

		Navarra		Valencia	
Scale	**Variables**	**Mean (SD)**	**β (t-value)**	**Mean (SD)**	**β (t-value)**
Market orientation (α_n=.51; α_v=.68)	MO1. I follow the quality guidelines I receive from clients.	6.08 (1.11)	.30 [a]	5.90 (1.25)	,55[a]
	MO2. I search for new clients every year	2.79 (2.09)	ni	3.31 (1.89)	Ni
	MO3. Clients guide me on which crop varieties to grow	4.18 (1.98)	.46(2.15)	3.23 (1.92)	,39(3.38)
	MO4. My interest in quality grants me advantages over other holdings	4.86 (1.69)	.49(2.18)	5.13 (1.89)	,80(4.91)
	MO5. My interest in offering cheaper products grants me advantages over other holdings	2.34 (1.49)	ni	2.83 (1.72)	Ni
	MO6. Client satisfaction is the main aim of my holding	5.21 (1.68)	.58(2.22)	5.88 (1.53)	,66(4.80)
Adoption of innovations (α_n=.54; α_v=.51) [2]	I1. Have you introduced new products (e.g. new varieties) and services (e.g. to provide services to third parties) over the last 5 years in your holding?	.45 (.49)	.78 [a]	.40 (.49)	,49 [a]
	I2. Have you adopted new production techniques (pruning, irrigation, mechanization, etc.) over the last 5 years?	.48 (.50)	.41(2.54)	.65 (.48)	,57(2.67)
	I3. Have you introduced new economic activities over the last 5 years	.71 (.45)	.46(2.61)	.25 (.43)	,46(2.62)
Present success results (α_n=.83; α_v=.87)	PS1. Compared to other holdings, mine obtains good profit margins	4.77 (1.28)	.51 [a]	4.72 (1.49)	,48 [a]
	PS2. Compared to other holdings, mine is less indebted	4.73 (1.64)	ni	3.36 (2.13)	Ni
	PS3. The price of my products covers production costs	4.77 (1.99)	.79(5.64)	3.72 (1.99)	,77(5.07)
	PS4. My holding's income allow for an acceptable standard of living	4.86 (1.74)	.92(5.94)	3.35 (1.72)	,90(5.20)
	PS5. I am satisfied with my holding's results	4.78 (1.71)	.77(5.58)	4.15 (1.83)	,58(4.42)
Future success results (α_n=.83; α_v=.77)	FS1. I am optimistic regarding my holding's survival	3.56 (2.19)	ni	4.35 (2.16)	Ni
	FS 2. My holding's profitability will improve in the future	4.58 (1.67)	.66 [a]	4.03 (1.87)	,71[a]
	FS 3. I am optimistic regarding my holding's income level	4.00 (1.87)	ni	2.85 (1.85)	Ni
	FS 4. The holding will provide a decent standard of living for me and my family in the future	4.58 (1.59)	.93(7.85)	3.70 (1.87)	,90(9.08)
	FS 5. I will become a successful producer	4.74 (1.51)	.75(7.23)	4.08 (1.99)	,89(9.05)

α reliability (Cronbach's α); β: standardized loading; SD: standard deviation; n.i.: not included in the measurement model because they are no superaron la validación inicial; [a]Fixed parameter

The complete list of items including the means and the standard deviations of each of the proposed items is given in Table 2.

[2] Lower alphas can be expected for scales containing relatively few items because the value of alpha is sensitive to the number of items (Peter, 1979). Although it is desirable to have higher reliability coefficients, Peter (1979) reports numerous coefficient alphas in the .5 range.

We can see that the owners of agricultural holdings are concerned mainly with the quality perceived by their customers (mean=6.08 in Navarre, mean=5.90 in Valencia) and with quality understood as a competitive advantage over other firms (mean=4.86, mean=5.13). As for innovations adopted over the last 5 years, they are mainly represented by adoption of new economic activities in Navarre (mean=.71) and new production techniques in Valencia (mean=.65). Therefore, holdings in Navarra have opted more for production diversification whereas Valencian ones lean towards the introduction of new technologies. It is worth noting that present success results show that the owners of holdings in both regions are satisfied with their profit margins (mean=4.77, mean=4.72). However, Valencian holding owners appear less confident on present results than their Navarran counterparts. In terms of future success results, we observe a particular concern with future holding's success in Navarre (mean=4.74) and with its survival in the case of Valencia (mean=4.35). In general terms farmers in Navarra seem to have a more positive view of present and future results than farmers in Valencia. This more pessimistic perception of Valencia farmers can be related with the overproduction in the citrus sector, in a context of weak farm structures (81.5 percent of farms in Valencia with a gross margin below 10,000 euro against 54.9 percent in Navarra).

3.3. Multi-group analysis

In order to test invariance of the patterns of factor loadings in the scale across the two samples, we relied on Byrne's (2004) multisteps for testing multigroup invariance using the AMOS program. As a prerequisite step for invariance testing, it is necessary to ensure that those items postulated to reflect the same latent construct are indeed highly correlated with each other and thus reliable. The measurement model was tested within each of the two groups using two independent Confirmatory Factor Analyses (CFAs) to validate the baseline model. Additionally, to determine whether the constructs in our model were distinct from each other, we performed a test of the scales' discriminant validity. According to Byrne (2006) scale variables are sufficiently different from one another if a scale's Cronbach alpha is greater than its shared variance with any other scale variable in the model.

A simultaneous estimation of the model in both samples was then carried out, to check if the number of factors was the same, that is to say, if they have the same shape. To do this, the study again tested the overall model fit of the baseline model determined across the two groups simultaneously, rather than separately, for further comparisons. As far as goodness of fit is concerned, the use of multiple indexes is generally recommended. With the validity of the proposed model analyzed, the structural model was now analyzed through multigroup analysis. This procedure involves a series of multigroup hierarchical analyses that evaluate the different types of invariance across groups (Vandenberg and Lance, 2000) . Once the models are estimated, chi-squared differences were tested to see if the difference between models with equality restrictions and without them was significant.

4. Results

4.1. Measure reliability and validity

Two CFAs, one for each region, are performed to assess the underlying structure of the variables in the model and to evaluate the measurement model for the modelled constructs, i.e., market orientation, adoption of innovation and present and future positive performance. As shown in Table 2, the results of the CFAs show that the described model suitably fits both data sets (Navarra: χ^2=132.41, df=71, p<0.01, RMSEA=.08, CFI=.88, GFI=.88, IFI=.89; Valencia: χ^2=1.07.95, df=71, p<0.01, RMSEA=.07, CFI=.93, GFI=.88, IFI=.93). All standardized regression weights of

individual items respective latent variables are higher than the threshold of .4. All items are significantly associated with their specified constructs (p<.01). Additionally, all the scales satisfy the composite reliability tests (close to or above .7) and the average variance extracted values (close to or above .5), showing that all scales have moderate to high reliability and validity. Therefore, the internal validity of the measurement model is adequate in both regions.

Additionally, the discriminant validity of the measure model proposed was confirmed. Thus, the correlation matrix showed that most of the constructs are highly correlated. The values are portrayed along the diagonals of Table 3, together with inter-scale correlations. Finally, the validation of the measurement model is completed with the simultaneous estimation of the model in both samples to verify that the number of factors is the same, i.e. that they have the same shape, and again the model fits properly (χ^2=240.36, p<.01, RMSEA=.05, CFI=.91, GFI=.88, IFI=.91).

Table 3. Interconstruct correlations[a]

	Market orientation	Adoption of innovation	Present positive performance	Future positive performance
Market orientation	**.51(.68)**			
Adoption of innovation	-.27(.34**)	**.54(.51)**		
Present positive performance	.41***(.26**)	-.25**(.03)	**.83(.87)**	
Future positive performance	.20(.55***)	-.19(.32***)	.68***(.55***)	**.83(.77)**

[a] In bold, the Cronbach´s α; ***p<.01;**p.05.The first quantity corresponds to the values of Valencia sample, the quantity in brackets refers to Navarra sample.

4.2. Multigroup invariance

Once the reliability and validity of the measurement model in the two samples have been tested separately and together, the invariance of the structural model was analyzed. As already indicated, the first step is to determine a benchmark to test all the hypothesized relationships in the theoretical model in terms of the goodness of fit indices. As seen in Table 4, the model showed an acceptable fit. Thus a χ^2 value of 240.36 (χ^2/gl=1.69) was obtained, a CFI of .91, GFI de .88, IFI de .91, and a RMSEA value of .05. This indicates that configural invariance is achieved and, furthermore, provides support for the fixed and non-fixed configuration of parameters in the research model being identical with the Navarra and Valencia samples. This means that the structure of the relationships established in the model proposed is similar in both regions, which lead us to conclude that agri-food producers also have an interest in orienting themselves to and knowing their target markets and in making changes which will impact on the current and future results in their holdings. Market orientation and innovation can be seen as key factors in the strategy followed by farmers in both regions, in spite of the diversity in terms of farm structures.

When the equality of factor loadings in the two groups (metric invariance) is tested it shows how this restriction increases the χ^2 value from 240.36 to 253.77, gaining 10 degrees of freedom. Because the metric invariance model (Model 2) is nested within the base model (Model 1), a test of the χ^2 difference was carried out. Taking into account that the χ^2 difference of 13.41 with 10 degrees of freedom was not statistically significant at >.05, the metric invariance was confirmed. Although χ^2 test has been widely used to test the goodness of fit, there are others such as CFI=.90, GFI=.88, IFI=.91 y RMSEA=.05. Thus, a good model of fit for Model 2 is also confirmed. The insignificance of Model 2 (metric invariance) with respect to Model 1 (configural invariance) makes possible their subsequent comparison with the scale invariance

(Model 3). Finally, when comparing Model 3 (scalar invariance) to Model 1, significant differences are observed (χ^2 difference=29.13 at <.05) and thus scalar invariance for the proposed model is not confirmed. The confirmation of the configural and metric invariance of the model proposed suggests that the restricted model is the same as the unrestricted model in terms of the estimated parameters and the scores obtained in different groups. All this leads to the conclusion that the model is applicable to all groups and shows sample measurement invariance.

Table 4. Invariance tests for loadings across two samples.

Model description	χ^2	df	χ^2 difference	P difference	CFI	GFI	IFI	RMSEA (90% CI)
Configural invariance (Model 1)	240.36	142	-	-	.91	.88	.91	.05 (.042, .065)
Metric invariance (Model 2)	253.77	152	13.41	.20	.90	.87	.91	.05 (.041, .064)
Scalar invariance (Model 3)	269.49	158	29.13	.02	.89	.87	.90	.05 (.043, .065)

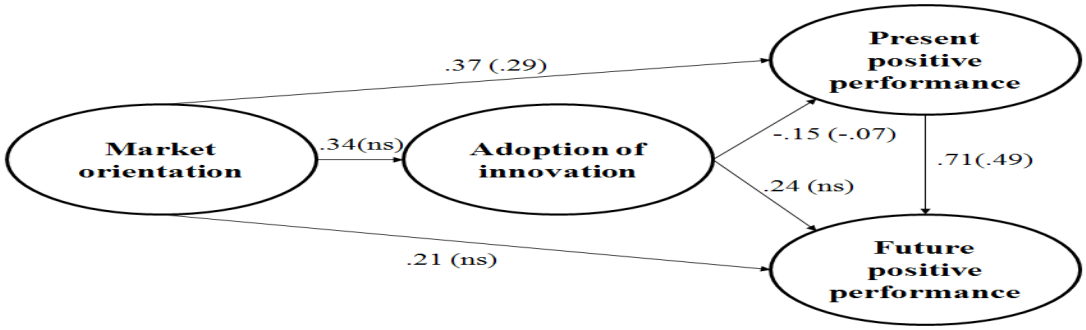
4.3. Hypothesis testing

To finalize this presentation, we look at the testing of the structural model. Having validated the scales, the structural model (χ^2=240.36 (gl=142), RMSEA=.05, CFI=.91, GFI=.88, IFI=.91) has an acceptable model fit. Most of the proposed relationships are significant in both samples (Figure 2). This confirms that there is a positive relationship between market orientation and the actual positive performance (Navarra: β=.37, t=1.81, p<.10; Valencia: β=.29, t=2.02, p<.05), supporting H2a. No relationships are found between the adoption of innovations and present positive performance (Navarra: β=-.15, t=-1.15, p>.10; Valencia: β==-.07, t=-.44, p>.10), confirming H3a. H4, which predicts a positive link between actual and future positive performance of the firms (Navarra: β=.71, t=4.24, p<.01, Valencia: β=.49, t=3.69, p<.01), is also supported.

The rest of the hypotheses were confirmed only in the Valencia sample. Thus, only in this sample H1 was confirmed, establishing that market orientation has a significant effect on adoption of innovations (β=.34, t=1.97, p<.05). H2b, which predicts a positive link between market orientation and future success results is also confirmed in the Valencia sample (β=.21, t=1.82, p<.10). The same happens with H3b, which holds that adoption of innovations has significant effects on future success results (β=.24, t=1.68, p<.10).

The structural model suggests that the causal model closely fits the data from both samples. All the hypothesized relationships are empirically supported or partially supported at p<.10. All the paths from the latent constructs to their composite indicators prove statistically significant (t>1.96, p<.01). Specifically, the results for both regions confirm that market orientation and adoption of innovations have a positive impact on the present success results of agricultural holdings. Furthermore, the results obtained in the present influence future results for the holding. Moreover, the impact of market orientation on the adoption of innovations and in future success results, as well as the effect of adoption of innovations on these results were only confirmed in the Valencia region. These results are discussed in more depth in the next section.

Figure 2. Structural model for Navarra and Valencia samples.



The first quantity corresponds to the values of Valencia, the quantity in brackets refers to Navarra.

5. Discussion and Conclusions

The study has selected two Spanish regions and the results suggest that market orientation is a relevant driver of correct economic and financial functioning in agricultural holdings. In the selection of regions, we focused on two regions with significant presence of small holdings, with low capacity in financing R&D activities, but that does not mean a lack of innovative behaviour or low capacity in technology adoption. Both were selected by their relative specialization on cultures not strongly influenced by the Common Agricultural Policy (CAP), such as fruit and vegetables, although CAP instruments are more influential in Navarra than in Valencia, through the presence of arable crops and livestock in the first region. With CAP under question on the new trends shaped by the political debates on a future post-2015 CAP, market orientation becomes more important a driver of competitiveness and innovation. This was confirmed by the political agreements was reached at the EU level on past June 2013[3], which support the market orientation of the CAP and pose innovation as a cross-cutting theme in the rural development policy.

Market orientation was found to favour positive economic results of the firms. In this sense, the farmers more oriented to the quality and to satisfy their customers achieve more positive results, in similar terms to those obtained by Sin et al., (2009) or Ellinger et al., (2008) with other measures of the results. The study reveals that important elements of agricultural producers' market orientation, customer care and quality have similar impact in the geographical areas studied. Furthermore, the higher the interest in the market on the part of producers the better they consider their final results. These results suggest that there is a critical mass of producers, at least in the regions analyzed, who are sensitive to market signals in the context of a more competitive agriculture, increasingly oriented to the market such as European agriculture.

The connection between market orientation and innovation adoptions is yet to be clarified. Market orientation can have different levels of impact on innovation adoption depending on the kind of improvement launched by producers (diversification of productive activities or technology improvements). Thus, a more clear and positive relationship in terms of technological improvements is perceived (in the case of Valencia) but not in terms of diversification (in the case of Navarra). Then there is the

[3] A political agreement was reached on 26 june 2013. See http://ec.europa.eu/agriculture/cap-post-2013/agreement/index_en.htm.

question of whether or not market orientation is a catalyst for innovations. The literature has already shown that agricultural firms can be considered supply-dominated businesses, which have been associated with low technological intensities, a large number of small enterprises, low rates of entrepreneurship (Alba et al., 2011) and in many cases, low labour costs. Fearne et al., (2013) and García-Alvarez-Coque et al. (2012) investigated the inter-sectorial flows of innovation in the agri-food sector including both agriculture and agri-industry in the Valencia region (see also Alba et al., 2011), showing the importance of embodied knowledge in inputs purchased from other sectors. Copus et al. (2008) provided evidence that competition can affect innovation up to a certain point. If the actual level of competition is very high in a particular country or at the international level then increasing competition could lead to dissipation in innovation rents and hence reduced incentives to invest in innovation.

In this regard and as we have noted before, in Valencia a positive relationship between market orientation and adoption of innovation was observed. The atomization of farm structures in a very competitive environment and the presence of citrus productions with strong market orientation may have favoured the dissemination and adoption of innovations in such region. Although the relationship between market orientation and adoption of innovation was not confirmed in Navarra, farmers in both regions have simultaneously shown an interest in quality production and adoption of innovation, though with differences in terms of the type of innovation adopted in each region. Nevertheless, further analysis would be required to identify the process through which market orientation influences innovation adoption in both regions. In this sense, the relationship between market orientation and innovation can include alternative options as we have indicated previously (Aldas-Manzano et al., 2005, Nassution et al, 2010). Additionally, Valencia also shows a positive relationship between adoption of innovations and positive economic results of the farmers, which suggests a possible feedback with market orientation and its influence on adoption. Market dynamism influences firms' results (Li and Calantone, 1998, Schwartz, 2006, Cillo et al., 2010). On the other hand, it has to be recalled that in some situations the influence of innovation on the results is not immediate, or may differ according to the alternative ways of measuring the economic-financial results obtained by businesses.

Finally, some additional considerations about the peculiarities of the innovation in the agricultural sector can be made. Thus, Van der Veen (2010) insists on the existence of complexity in innovation in this sector, because it is influenced by social, economic and environmental factors. Ten Berge et al., (2000) pointed to the impact of intensive agriculture on environmental degradation and the diminution of nature and landscape values. For that reason, they proposed the simultaneous consideration of economic goals, rural employment and the maximum level of environmental preservation in the reorientation of farms activities. For that, the context of innovation in agricultural sector it is not only given by technological solutions that have to be found but by solutions that are socially and environmentally sustainable as well (Hermans et al., 2013).

References

Alarcón, S., Sánchez, M. (2013). External and Internal R&D, Capital Investment and Business Performance in the Spanish Agri-Food Industry. *Journal of Agricultural Economics*, 64 (3): 654-675.

Aldas-Manzano, J., Küster, I., Vila, N. (2005). Market orientation and innovation: an inter-relationship analysis. *European Journal of Innovation*, 8 (4): 437-452.

Moreno, C.; Arnalte, E. and Ortiz, D. (2011) Breaking down the growth of family farms: A case study of an intensive Mediterranean agriculture. *Agricultural Systems*, 114: 500-511.

Avermaete, T., Viaene, J., Morgan, E.J., Pitts, E., Crawford, N., Mahon, D. (2004). Determinants of product and process innovation in small food manufacturing firms. *Trends in Food Science and Technology*, 15 (10): 474-483.
Bayona, C., Cruz, C., García, T., Sánchez, M. (2013). *The effects of open innovation practices of Spanish Agri-Food firms on the innovation performance*. (Chapter (Chapter 5, pages 74-96) in Open innovation in the food and beverage industry. Woodhead Publishing Ltd. Editor: Dr Marian García.
Bigné, E., Blesa, A., Küster, I., Andreu, L. (2004). Market orientation: an antecedent to the industrial manufacturer's power. *European Journal of Marketing*, 38 (1-2): 175-193.
Bhuian, S., Menguc, B., Bell, S. (2005). "Just entrepreneurial enough: the moderating effect of entrepreneurship on the relationship between market orientation and performance", *Journal of Business Research*, 58: 9-17.
Byrne, B.M. (2001). *Structural Equation Modeling with AMOS: Basic Concepts, Applications, and Programming.*Mahway, New Jersey: Lawrence Erlbaum Associates, Publishers.
Byrne, B.M. (2004). Testing for multigroup invariance using AMOS graphics: A road less traveled. *Structural Equation Modeling*, 11(2): 272-300.
Byrne, B.M. (2006). *Structural Equation Modeling with EQS: Basic Concepts, Applications and Programming* (2nd Edition). Lawrence Erlbaum Associates: London.
Calantone, R.G., Cavusgil, S.T., Zhao, Y. (2002). Learning orientation, firm innovation capability and firm performance. *Industrial Marketing Management*, 31: 515-524.
Capitanio, F., Coppola, A., Pascucci, S. (2009). Indications for drivers of innovation in the food sector. British Food Journal, 111 (8): 820-838.
Cillo, P., de Luca, L., Troilo, G. (2010). Market information approaches, product innovativeness, and firm performance: An empirical study in the fashion industry. *Research Policy*, 39: 1242-1252.
Desphandé, R., Farley, J.U. (1998). Measuring market orientation: Generalization and synthesis. *Journal of Market-Focused Management,* 3: 213-232.
Ellinger, A., Ketchen, D., Hult, T., Banu, A., Glenn, R. (2008). Market orientation, employee development practices, and performance in logistics service provider firms. *Industrial Marketing Managemen*t, 37, 353-366.
Fearne, A., García Álvarez-Coque, J.M., García, T., Sánchez, M. (2013). Innovative firms and the urban/rural divide: the case of the agri-food system in the Valencia región. Management Decision, 51 (6), 1293-1310.
Filippaios, F. Papanastasiou, M., Pearce, M., Rama, R. (2009). New forms of organization and R&D internalisation among the world's 100 largest food and beverage multinationals. Research Policy, 34: 1032-1043.
Fortuin, F.T.J.M., Batterink, M-H, Omta, S.W.F. (2007). Key success factors of innovation in multinational agrifood prospector companies. *International Food and Agribusiness Management Journal*, 10 (4): 1-24.
Furtan, W.H., Sauer, J. (2008). Determinants of food industry performance: survey data and regressions for Denmark. *Journal of Agricultural Economics*, 59 (3): 555-573.
Galizzi, G., Venturini, L. (1996). *Product innovation in the food industry: Nature, characteristics and determinants.* In G. Galizzi, & L. Venturini (Eds.), Economics of innovation: The case of food industry (pp. 133–156). Heiderlberg: Physica-Verlag.
García-Martínez, M., Burns, J. (1999). Sources of technological development in the Spanish food and drink industry. A "supplier dominated" industry? *Agribusiness*, 15 (4): 431-448.
Grinstein, A. (2008). The relationships between market orientation and alternative strategic orientations. A meta analysis. *European Journal of Marketing*, 40, (1-2): 115-134.
Grunert, K., Harmser, H., Meulenberg, M., Kuiper, E., Ottowitz, T., Declerck, F., Traill, B., Göransson, G. (1997). *A framework for analysing innovation in the food sector. Product and process innovation in the food industry*. Blackie Academic and Professional. London. UK.
Hakala, H. (2011). Strategic orientations in management literature: three approaches to understanding the interaction between market, technology, entrepreneurial and learning orientations. *International Journal of Management Reviews*, 13: 199-217.

Hair J.F., Anderson R.E., Tatham R.L., Black W.C. (1998). *Multivariate data analysis* (5th ed.), Upper Saddle River, NJ: Prentice Hall.
Harris, L.C. (2001). "Market orientation and performance: objective and subjective empirical evidence from UK companies". *Journal or Marketing Studies*, 38 (1): 17-43.
Im, S., Hussain, M., Sengupta, S. (2008). Testing interaction effects of the dimensions of market orientation on marketing program creativity. *Journal of Business Research*, 61: 859-867.
Jaw, C., Lo, J., Lin, Y., (2010). The determinants of new service development: service characteristics, market orientation, and actualizing innovation effort. *Technovation*, 30,:265-277.
Jaworski, B.J. and Kohli, A.K. (1993). "Market orientation: antecedents and consequences". *Journal of Marketing*, 3: 53-70.
Kollinger, P. (2006). The relationship between technology, innovation and firm performance. Empirical evidence from e-business in Europe. *Research Policy*, 37 (6): 1317-1328.
Narver, J.C., Slater, S.F. (1990). The effect of a market orientation on business profitability. *Journal of Marketing*, 54: 20-35.
Olavarrieta, S., Friedmann, R. (2008). Market orientation, knowledge related resources and firm performance. *Journal of Business Research*, 61: 623-630.
OECD (2009). OECD Rural Policy Reviews: Spain, OECD Publishing. Paris.
Paladino, A. (2008). Analyzing the effects of market and resources orientations on innovative outcomes in times of turbulence. *Journal of Product Innovation Management*, 25: 577-592.
Peter, J.P. (1979). Reliability: A Review of Psychometric Basics and Recent Marketing Practices. *Journal of Marketing Research*, 16: 6-17.
Rama, R. (2008). Handbook of innovation in the food and drink industry. New York. Haworth Press.
Salavou, H., Avlonitis, G. (2008). Product innovativeness and performance: a focus on SMEs. *Management Decision*, 46 (7): 969-985.
Schwartz, J. (2006). The Five Founding Principles That Drive Innovation. *The Financial Times*, (September 12), (accessed January 15, 2007), [available at http://www.FT.com].
Sin, L., Tse, A., Heung, V., Yim, F. (2005). An analysis of the relationship between market orientation and business performance in the hotel industry. *Hospitality Management*, 24: 555-577.
Slater, S.F., Narver. J.C. (1994). Does Competitive Environment Moderate the Market Orientation Performance Relationship?. *Journal of Marketing*, 58: 46- 55.
Spillan, J., Parnell, J. (2006). Marketing resources and firm performance among SMEs. *European Management Journal*, 24 (2-3): 236-245.
Steenkamp, J.E.M., Baumgartner, H. (1998). Assessing Measurement Invariance in Cross-National Consumer Research. *Journal of Consumer Research*, 25: 78-90.
Tajeddini, K. (2010). "Effect of customer orientation and entrepreneurial orientation on innovativeness: evidence from the hotel industry in Switzerland". *Tourism Management*, 31: 221-231.
Ten Berge, H. F. M., Van Ittersum, M. K., Rossing, W. A. H., Van de Ven, G. W. J., & Schans, J. (2000). Farming options for The Netherlands explored by multi-objective modelling. *European Journal of Agronomy*, 13(2): 263-277.
Traill, B., Meulenberg, M. (2002). Innovation in the food industry. Agribusiness, 18 (1), 1-21.
Van der Veen, M. (2010). Agricultural innovation: invention and adoption or change and adoption? World Archaeology, 42 (1): 1-12.
Vandenberg, R.J., Lance, C.E. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational Research Methods*, 3: 4-69.
Wernerfelt, B. (1984). The Resource-Based View of the Firm. *Strategic Management Journal*, 5, (2): 171–180.
Zhou, K., Gao, G., Yang, Z., Zhou, N. (2005). Developing strategic orientation in China: antecedents and consequences of market and innovation orientations. *Journal of Business Research*, 58: 1049-1058.