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Additional Information

Ethical Certification in the Spanish Agrifood Industry:

An Alternative Paradigm?

Abstract

The agrifood sector belongs to traditional industries often supported by the national governments. The quality of the output is directly related to human health and therefore, several initiatives within the EU have been introduced. These initiatives support the consciousness of the broad public, including the individual agrifood businesses. Besides the marketing standards, geographical indications and organic farming, there are also national and private certification schemes. All these tendencies shall promote the socio-ethical principles of the business to support the non-monetary issues related to the agrifood sector. This paper provides a closer exploration of the socio-ethical aspects of companies in the Spanish agrifood sector. Any awareness of these principles in the daily business routine can be considered as a potential competitive advantage for an individual company. The objective of the paper was to examine whether there are significant differences among individual sub-industries within the Spanish agrifood sector in terms of social and ethical aspects. A sample of 66,047 different agrifood companies in the year 2012 was examined. Results of both empirical tests prove that there are significant differences between the selected research groups. The selected statistical testing (Kruskal-Wallis) proved this statistically significant difference between the agricultural producers, manufacturers, wholesalers, and retailers.

Keywords: business ethics, human resources, Spanish agrifood sector, socio-ethical certification
JEL codes: Q13, O13

1. Introduction

The agrifood industry is a sector of crucial economic and political importance. Therefore, but not only, it is one of the most regulated sectors in the EU, with significant impli-

cations on human safety, environmental issues and economic sustainability (Iakovu et al. 2014). The growing importance of the agrifood sector in terms of number of employees or its contribution to environmental impacts has led to increased demands for addressing ethical and social issues related to their supply chain (Iakovu et al. 2014), also known as *from wheat-to-bread* chain (Gracia et al. 2010). For example, in Spain in the 1960s, the link of other gainful activities was promoted: "*When the Spanish government had a policy of subsidizing the refurbishment of houses in rural areas which offered tourist accommodation, thus improving the quality of rural buildings and maintaining the cultural heritage, as well as providing new sources of income for rural families*" (Cànoves et al. 2006, pp. 215). These social and ethical aspects are at the center of interest for this paper.

Contemporary global political and economic situation is characterized by an increasing trend towards alternative forms of governance. Rising incomes and world-wide food scares have given rise to demand for assurance of quality and safety food issues. These signals have been sent back to suppliers who are asked to incorporate quality and safety management standards to their production and distribution processes (Fulponi 2006). The initiatives of governments are unsuccessful: majority of governmental efforts on the global level are often seen today as ineffective in negotiating far-reaching agreements in the increasingly complex political system and government-led regulations are considered costly (Kalfagianni 2014), as outlined above. Instead, any institutional initiatives introduced by private actors (i.e. firms, society) for governance began to gain ground (Conde et al. 2013; Bitzer et al. 2013). In other words, it is not only the monetary objectives which are the drivers of the business growth. The increasing importance of non-monetary motives can be often seen today.

The rise of private standardization belongs to the natural response to globalization and development of market economy as one of the main initiative to survive, being economically profitable and, more importantly, being based on alternative and traditional values. These types of governance include not only quality and safety assurance, but also certification, codes of conduct or labelling. Besides the quality and safety standards, private standards focusing on environmental sustainability, ethics or various social aspects are gaining more relevance (Gawron and Theuvsen 2009; Henson 2011). Moreover, systematic values assurance and improved behavior within the community are considered

as cornerstones for improving the competitiveness of European agrifood companies in the coming decades.

We understand these challenges to be crucial in the future for agrifood sector and its "re-localized" economics, and agree with Downey (2006) who claim that the whole European agrifood sector is being rapidly reshaped by international policy developments, combined with non-monetary issues as food security, ecological sustainability and future viability of rural regions. These regions vary significantly across countries and one of the biggest challenges for the European rural areas is to stop rural depopulation (OECD, 2009). Currently in Spain there is an ongoing debate on how to prevent the problem of losing human power in areas with poor living conditions resulting from topography or climate diversity. It is the primary sector what represents the main driver for employment in these rural areas. Moreover, for Spain similarly as for the other European agrifood economies, other non-farm activities are important to diversify the income.

In this context, the aim of this paper is to examine whether there are significant differences among individual sub-industries within the Spanish agrifood sector (agricultural producers, manufacturers, wholesalers, and retailers) in terms of social and ethical aspects. In other words, we aim to provide the empirical evidence whether the social and ethical aspects in Spanish agrifood companies are identical according to the location within the commodity vertical, or whether there is any potential room for improvement. The examined aspects are not based on company performance or size. Therefore, the potential differences may originate from the social and ethical consciousness of an individual company. The general indicators for assessing the social and ethical aspects were selected based on the literature review and common practice applied in the database Amadeus, which was used as a source for the research sample.

This paper is structured in the following way. First, the most relevant and recent theoretical and empirical literature review is provided. Next, methodology is summarized, such as the data base used, the selected variables and the research model development are presented. Following that, results are commented on and discussed. Finally, the main conclusions and recommendations for further research are set out.

2. Background and hypothesis

2.1. Theoretical framework

According to the Solow's neoclassical model for growth, investment in labor and capital is a key factor to achieve economic growth. Modern growth theories also recognize the importance of human capital in the context of economic growth, even though it cannot be transferable like land or fixed capital. Porter's theory on the value chain also addresses human capital, namely in the internal processes within the individual companies, where "each of these activities can contribute to a firm's relative cost position and create a basis for differentiation" (Porter 1985, cited in Ghemavat 2002). He claims these are the general sources of competitive advantage. He also ranks business ethics of business relationships and quality of human resources to the secondary, supporting activities. These activities support the primary functions of a company (such as sales, logistics, or operations) and therefore, indirectly relate with the value which is created by the company. Besides, according to Porter's hypothesis, well-crafted voluntary approaches[1] may increase both environmental performance and economic efficiency (Porter and van der Linde 1995, cited in Grolleau, et al. 2007).

To improve not only the profitability, but also the production quality of the agrifood companies, there have been introduced initiatives from the EC (European Commission). Besides the marketing standards, geographical indications and organic farming, there are certification schemes, both national and private. For example International Organization for Standardization (ISO) providing standards on giving specifications for products, services and systems and ensuring quality, safety and efficiency. Their general objective in practice is, however, to facilitate international trade. Usually, the certification schemes have very diverse objectives- they are often too broad and do not include any sector-specific aspects. Moreover, there are also remarkable differences among countries. Nevertheless, any certification initiative supports sharing of information and therefore has a significant effect on the companies' competitiveness.

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[1] For example, ISO 14001 or EMAS

2.2. Empirical research

There is vast, empirical literature which looks into the certification schemes, supply chain management techniques or providing stakeholder's perspective on both issues (Blazovich et al. 2014; Conde et al. 2013; Fulponi 2006; Grolleau, et al. 2007; Kalfagianni 2014). However, it is often regardless of the production activity or purely based on secondary data analyses, difficult to repeat or verify on specific research sample, or verify third-party methodology (Blazovich et al. 2014). The specificity of the industry is very relevant, since the certification schemes are often too general and need to be adjusted according to the industry (Conde et al. 2013). Detailed study of the individual parts of the agrifood sector allows better understanding of the nature of each part and more accurate recommendations (Alarcon and Polonio 2014; Gracia, Magistris, and Albisu 2010; Iakovou et al. 2014). The following table summarizes the main empirical studies in the research area.

Authors	Research sample	Research area	Location	Methods	Results
Gracia et al. (2010)	175 agrifood stakeholders 2007	Inter-organizatnl. relationships	Spain	Structural equation modelling, factor analysis	As the quality of relationships improves, the stakeholder competitiveness increases
Blazovich (2014)	76 companies, 2012	Employee-friendly companies, risk	North America	Student t-test and Wilcoxon single-rank tests	Performance of employee-friendly firms is better and their risk is lower
Bitzer (2013)	6 partnerships	Inter-sectoral partnerships	Peru	Exploratory case study	Material and non-material assets of partnerships, linkage to global markets, certification as a signal to realize change through the market, emphasis of certification
Alarcon and Polonio (2014)	449 agri-businesses 1998-2008	Innovations	Spain	Regression analysis	R&D has an influence on patent activity, technological cooperation was not proved, investments in capital goods are relevant contributions for patenting (incl. Quality of human resources)

The research strategy used in this paper reflects the strengths and weaknesses of the outlined research papers in terms of social and ethical indicators selection, as well as the research itself.

This section reviews the recent empirical research literature and provides its research sample, area, location of the research, methods used and the main results. The quality of communication within the agrifood industry and its influence on companies' competitiveness were subjects of interest for Gracia et al. (2010). They analyzed 175 agrifood stakeholders in Spain to examine the inter-organizational relationships by structural equation modeling. Their findings confirmed that as the quality of relationships improves, the stakeholder competitiveness increases. The question of company performance was examined also by Blazovich et al. (2014), too. They focused on 76 companies marked as '100 Best Companies to Work For' by Fortune magazine and analyzed their performance and riskiness based on data from Compustat database. They used standardized t-tests and Wilcoxon single-rank tests and they found that the performance of employee-friendly firms is better and their risk is lower. The relevance and importance

of certification was explored in the study of Bitzer (2013). He examined 6 partnerships in Peru through exploratory case studies and proved that certification serves as a signal to realize change through the market. Besides certification as a non-material asset of partnerships, he linked certification to business opportunities on the global markets. Alarcon and Polonio (2014) designed their research to highlight the determinants of technological innovation in Spanish agrifood sector. They used a panel data of 449 agri-businesses between 1998 and 2008 and through regression analysis they proved the important position of good-quality human resources contributing to innovation in a company.

2.3. Hypotheses

Based on the theoretical and empirical preview, the hypotheses tested in this study are stated as follows:

H_1: the level of business ethics in a company depends on the industry within the Spanish agrifood sector.

H_2: the quality of human resources in a company depends on the industry within the Spanish agrifood sector.

3. Methodology and Data

3.1. Data base

The data base used in this paper was taken from the database Amadeus, provided by the Bureau van Dijk. The analytical part was conducted from the representative sample of firms from the Spanish Agrifood sector in 2012 reported in the database Amadeus. From the database the sample of 66,047 different agrifood companies was extracted. This sample consists of SME[2] with 94.5% of observations and of large companies with 5.5%. We focus on SMEs because most firms from the Spanish Agrifood sector are small or medium sized. Moreover, we only examined SMEs because as Novak (2010) pointed out, there are different characteristics of the SMEs which lead to different mechanisms of building the business relationships within the commodity vertical compared to larger

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[2] Company size categories taken from the database Amadeus, based on the following criteria: operating revenue, total assets and number of employees

enterprises, although the latter are also oriented towards long-term high-quality relationships.

All the statistical analyses of data were conducted in the SPSS software.

3.2. Variables

Business ethics have been measured through the credit period (CrP, days, eq. 1). It explains the average period taken by the company in making payments to its creditors. The measuring unit is number of days. The lower the period, the better-developed business ethics will be in the company (Chern, et al. 2013; Wu et al. 2014).

$$CrP = Credit\ period = \frac{\text{creditors}}{\text{operating revenue}} * 360 \tag{1}$$

For the purposes of this paper, the social aspects of the company were reflected by the economic indicator *LCOR*: a ratio of labor costs and operating revenues (LCOR, %, eq. 2). The measuring unit is a percentage. According to the industry average, the score is calculated for the individual agrifood company and all companies are then marked as below average and above average, compared to the peer group, similarly in the previous variable *Credit period*. The higher the value for this variable, the higher will be the quality of the human resources used by the firm (Alarcon and Polonio 2014).

$$LCOR = Labor\ costs\ over\ operating\ revenue = \frac{\text{labor costs}}{\text{operating revenue}} * 100 \tag{2}$$

These two indicators shall represent the ethical and social aspects of the business relationships within the research industry. We are aware, that these indicators and their values shall be affected by the seasonal changes or extremes. On the other hand, the size of the research sample, 66,047 Spanish agrifood companies, may compensate for this.

Using NACE Rev. 2[3] industry groups to identify industry membership, we define the industry benchmarks according to the industry average of both measures calculated using all firms in the industry reported in the database Amadeus in 2012. To test our hypotheses, we created average industry-adjusted variables measuring how much the company's measure differs from the average values of all other firms within the particular industry and classifying them into categories: below-average and above-average. The agri-

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[3] Derived from French: "Nomenclature générale des Activités économiques dans les Communautés Européennes", second revision, valid since December 2006

food industry examined in this paper consists of agricultural producers (01.), manufacturers of food products (10.), and manufacturers of beverages (11.), wholesale trade (46.) and retail trade (47.) according to the NACE Rev. 2.

3.3. Research model development

As a first step it was important to determine and specify the variables involved in the model. In this paper, we used the variable *credit period* (CrP, days) to explain business ethics in a company. We introduce this assumption based on the fact that granting a permissible delay to settle the accounts between buyer and seller encourages the demand but at the same time and more importantly, it has a negative impact on costs and default risks to set up ethical and long-term business relationships within the commodity vertical (among others, for example: Chern, et al. 2013). The quality of the human resources in a company were estimated through the indicator *costs of employees over operating revenues* (LCOR, %).

Both variables used in this paper: *CrP* and *LCOR* take positive integer values and are ordinal. The variable industry is nominal categorical variable and therefore, instead of Pearson's statistics, Spearman's statistics or parametric ANOVA, it is appropriate to use the non-parametric Kruskal-Wallis test (eq. 3, 4). The logic of this test is as follows: Observations from all *k* nonempty groups are jointly sorted and ranked, with the average rank being assigned in the case of ties. The number of records tied at the *j*th distinct value $t_{j,f}$ is calculated incorporating the frequency weight, and the sum of $T_{j,f} = t^3_{j,f} - t_{j,f}$ is also accumulated. For each group the sum of ranks, $R_{i,f}$, as well as the number of observations, $n_{i,f}$, is obtained. The test statistic unadjusted for ties is

$$\text{H} = \frac{12}{N_f(N_f+1)} \sum_{i=1}^{k} \frac{R_{i,f}^2}{n_{i,f}} - 3(N_f + 1) \tag{3}$$

where $N_f = \sum_{i=1}^{k} n_{i,f}$. The statistic adjusted for ties is

$$H' = \frac{H}{1 - \sum_{i=1}^{m} \frac{T_{i,f}}{(N_f^3 - N_f)}} \tag{4}$$

where *m* is the total number of tied sets. The one sided *p*-value is $p_1 = \Pr(\chi^2_{k-1} \geq H') = 1 - \Pr(\chi^2_{k-1} \leq H')$, where χ^2_{k-1} follows a chi-square distribution with *k*−1 degrees of freedom. *p*1<α will reject the null hypothesis. All the testing uses an alpha of .05.

4. Results and discussion

4.1. Sample description

Table 1 presents descriptive data on 66,047 Spanish agrifood companies, and includes 62,438 small and medium-sized enterprises (SMEs), subjects for our analyses. The data are as at the end of the year 2012.

Table 1: Agrifood sector in Spain (based on data from Amadeus, 2012): Basic overview

	Industry (NACE Rev. 2)					
	01.[4]	10.	11.	46.[5]	47.[6]	Total
Number of employees (th)	110	219	43	221	484	1,077
Turnover (billion €)	16.6	62.8	14.1	80.4	94	267.9
Added value (billion €)	3	10	3.2	7.2	15	38.4
Number of companies (th)	16.2	9.8	2.4	24.2	13.4	66
Percentage of SMEs (%)	98	91	92	94	98	95

In the columns, there are individual categories of agrifood sector, according to the NACE, second revision; and in the rows there are several basic descriptive indicators. We include also the total column, to provide relevance within the Spanish economy. We also decided to use individual column for manufacture of beverages (NACE 11.), despite its relative size. The main reason was to comply with and respect the NACE methodology. In the last row, there is percentage of SMEs in each individual industry.

Table 2: Industry frequencies (based on the database Amadeus, 2012)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.	15,859	25.4	25.4	25.4
	10.	8,775	14.1	14.1	39.5
	11.	2,178	3.5	3.5	42.9
	46.	22,537	36.1	36.1	79.0
	47.	13,089	21.0	21.0	100.0
	Total	62,438	100.0	100.0	

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[4] Refers to Crop and animal production, hunting and related service activities
[5] Wholesale trade, except of motor vehicles and motorcycles
[6] Retail trade, except of motor vehicles and motorcycles

Table 2 provides the industry membership for our research sample. The Spanish commodity vertical starts with the individual agricultural producers (25.4%), continues with food and beverages manufacturers (17.6%) and ends with the traders, both wholesalers and retailers (57.1%).

4.2. Verification of hypotheses

Within the testing of the first hypothesis H1, we examined the indicator credit period. We evaluated each company by a score, depending whether it is above or below the industry average, which we calculated for all SMEs reported in the database Amadeus in 2012 with respect to the industry. As shown in table 3, the results demonstrate the Kruskal-Wallis statistics equals to 60.676 with the four degrees of freedom. The significance value has the value of .000, which is less than our alpha of .05. Therefore, based on the level of significance, we can reject the null hypothesis H1 directly. The results of the first statistical test: H1, whether the level of business ethics in a company depends on the industry within the Spanish agrifood sector, showed, that there is a statistically significant difference among the research groups. However, the alternative hypothesis doesn't only represent that one of the distributions has a different median. There can be seen a relationship between the level of business ethics (expressed in number of days of the credit period) in a company and industry in which a company is operating (manufacturers vs. traders, details in the methodology chapter). The lower the significance value, the less likely it is that business ethics and industry are unrelated. In this case, the significance value is so low that it is displayed as .000, which means that it would appear that business ethics and industry are, indeed, related.

Table 3: KW-test: Credit period grouped by industry

	CrP_Score
Chi-Square	60.676
df	4
Asymp. Sig.	.000

We also tested our second hypothesis, whether the quality of human resources in a company depends on the industry within the Spanish agrifood sector, by analyzing the labor costs over operating revenues and five categories of Spanish agrifood industry.

Our data analysis for second hypothesis parallels the method used to answer first hypothesis. Again, we used Kruskal-Wallis test to determine if there are statistically significant differences between five groups of the agrifood industry on an ordinal dependent variable: quality of the human resources.

Table 4: KW-test: Labor costs over operating revenues grouped by industry

	LCOR_Score
Chi-Square	589.650
df	4
Asymp. Sig.	.000

As presented in the table 4, the Kruskal-Wallis statistics equals to 589.650 with the four degrees of freedom. The significance value has also the value of .000, similar to the first hypothesis. Again, based on the level of significance, there is a relationship between the quality of human resources in a company and company's industry.

To sum up the results of both empirical tests, we can state that there are significant differences between the selected research groups in terms of business ethics, expressed by the variable Credit period and quality of the human resources, expressed by the variable LCOR. The selected statistical testing (Kruskal-Wallis) proved this statistical significant difference between the agricultural producers, manufacturers, wholesalers, and retailers. For determining which of the five groups differs from each other, the post hoc tests can be applied. Post hoc test (i.e. Dunn's method) can be used in case of the null hypothesis rejection. In this paper, however, it is crucial to prove that there is a significant difference among industries of agrifood sector in terms of business ethics and quality of human resources.

Since there are categories of industry significantly dissimilar from other categories, we can see a room for improvement. Since both of the examined indicators are relative, there is no direct link to the company size. In other words, even small companies can reach positive above-average values of analyzed indicators and therefore rank among ethical companies and companies employing good-quality personnel.

These seem to be fairly significant and are in line with other studies on agrifood performance (Bitzer 2013; Grolleau, et al. 2007). This paper adopted the variable selection from the study of Alarcon and Polonio (2014) and we also focused on agribusinesses as

Gracia et al (2010) or Alarcon and Polonio (2014), however, our research sample is larger – we examined more than 66 thousand of Spanish agrifood companies in the year 2012. Our research is also fully reproducible and verifiable; since we used the standardized accounting and economic data from the database Amadeus from Bureau van Dijk. Many studies also distinguish the company size; we also decided to analyze SMEs separately, as the 94.5% of our research sample, with the different economic results from large and very large companies.

However, to avoid any biases in further research, more detailed and opened certification methods need to be employed. There is a need for measurable metrics for company assessment to be able to state whether a company is getting closer or further from the broadly acceptable values of socio-ethical indicators.

5. Conclusions

This paper studies the business ethics of a company as well as quality of the human resources in Spanish agrifood industry. A sample of 66,047 different agrifood companies was examined as at 2012. Results indicate that there is a relationship between the level of business ethics in a company and industry in which a company is operating. Given these results, we conclude that level of business ethics of individual companies in individual parts of the commodity vertical is significantly different.

Regarding the quality of the human resources in individual agrifood companies, findings indicate that there are significant differences between five groups of the agrifood industry on the quality of the human resources.

Since there are differences between companies in individual parts of the agrifood chain and both examined variables were relative, we conclude that there is room for improvement and the differences originate from the social and ethical consciousness of individual companies. Our findings showed the importance of the agricultural sector in Spain and its capacity for income generation.

This study was limited in terms of data availability from the database Amadeus, in other words, in the paper no field research was employed. The compromised selection of variables explaining the business ethics and human resources in a company shall be confirmed by the field research, for example by a survey on Spanish agrifood companies.

On the other hand, this research design allowed us to analyze considerably large dataset and therefore, our results have statistical significance.

For the further research we recommend to focus more on the competitiveness of individual companies and risks related with their operations. Since there is a lack of data in terms of company certification, another compromise can be expected.

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