International Food and Agribusiness Management Review
Volume 15, Issue 4, 2012

Are Organic Growers Satisfied with the Certification System? A Causal Analysis of Farmers' Perceptions in Chile

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Abstract

This study addresses farmer satisfaction with organic certification and its determinants. The findings show that the majority of the interviewees are satisfied with the certification system. Furthermore, the perceived benefit in terms of farm income is the most important factor determining satisfaction, suggesting a need to improve communication of other potential benefits such as market access. The perceived bureaucracy associated with organic certification negatively affects farmers' expectations, indicating that the simplification of the certification process and harmonisation of organic standards should be considered in the political debate. Surprisingly, the perceived reliability of organic certification has no significant effect on satisfaction. This study discusses market and policy implications.

Keywords: certification, satisfaction, organic standard, reliability, Chile

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Introduction

Organic production is classified as a process-oriented attribute that cannot be detected in the end product (Giannakas 2002; Jahn, Schramm, and Spiller 2004a; Jahn, Schramm, and Spiller 2005). This means that information about the nature of these products is asymmetric, allowing opportunistic behaviour through e.g. mislabelling. While producers know whether the product is organic or not, consumers and even retailers do not (Giannakas 2002). To reduce market failure in the food market and to ensure that the end product meets the appropriate process and product standards, third-party certification[1] (TPC) has arisen as an institutional framework for monitoring and enforcing compliance with food quality and safety regulations (Lohr 1998; Giannakas 2002; Hatanaka, Bain, and Busch 2005; Jahn, Schramm, and Spiller 2005; Anders, Souza-Monteiro, and Rouviere 2007, Hatanaka and Busch 2008). In the organic market, third party certifiers monitor farmer compliance through criteria set by certification standards. In the case of a positive appraisal, a certificate indicating compliance with the standard is issued.

Given that certification as an institutional mechanism is relatively young in the food industry, there have been some attempts to evaluate the performance of various certification standards and quality assurance systems in the agribusiness sector from different perspectives (e.g. Jahn, Schramm, and Spiller 2004a, 2004b; Jahn, Schramm, and Spiller 2005; Gawron and Theuvsen 2006; Enneking, Obersojer, and Kratzmair 2007; Jahn and Spilller 2007a, 2007b; Schulze et al. 2008; Albersmeier, Schulze, and Spiller 2009; Albersmeier et al. 2009; Karipidis et al. 2009; Herzfeld, Drescher, and Grebitus 2011). However, few studies have investigated certification in the organic food sector. These include an assessment by Schulze and Spiller (2010) of farmers' acceptance of organic certification in the German market. Albersmeier, Schulze and Spiller (2009) analyse farmers' perceptions of the reliability of the organic scheme in Brazil and Costa Rica. Barrett et al. (2002) and Garcia Martinez and Bañados (2004) focus on the impact of organic standards on exports in developing countries. To the best of our knowledge, no study has analysed farmers' perceptions of organic certification in Chile. Specifically, this is the first attempt to analyse farmer satisfaction with the organic certification process in less developed organic markets.

Chile has a long tradition as a producer and exporter of agricultural products, supplying the most important food markets worldwide. According to official statistics, exports of agricultural products[2] accounted for US$ 8,897.4 million in 2011, which represents 11% of the Chile's total exports (Banco Central de Chile, 2012). Organic farming is now becoming an attractive alternative production method for Chilean growers. Advantages such as geographical location and phytosanitary status place Chile in a privileged position to promote and expand organic farming. In addition, the political debate on organic farming in recent years has resulted in the implementation of an official law[3] that currently regulates organic farming and certification

[1] Certification is defined as "the (voluntary) assessment and approval by an (accredited) party on an (accredited) standard" (Meuwissen et al. 2003). Similarly, according to Giannakas (2002) certification is "a process through which unobservable product characteristics (such as the process through which they have been produced) are guaranteed to consumers through a label. To avoid conflicts of interest, the guarantee is usually issued by an independent third (private or public) party whose ability to verify producer claims is greater than that of an individual".

[2] Official statistics do not currently distinguish between conventional and organic products.

[3] On 24th December 2007, the Chilean organic Law N° 20.089 came into force, together with its regulations and technical standards. This law establishes a national certification system for agricultural organic products. According

activities in Chile. As a result, the current organic standard provides a legal regulatory framework to encourage conventional farmers to convert to the organic sector. Despite Chile's potential for organic farming and the establishment of an official regulation, organic production still represents a small proportion of Chilean agriculture. According to official statistics, there are around 151,000 ha under organic cultivation in Chile (ODEPA 2011a). This represents 0.5% of the area covered by livestock and agricultural production[4]. As the market for domestic consumption is still undeveloped, Chile's organic production is export-oriented (ODEPA 2011b). This means that organic growers must comply not only with the local organic regulation, but also with organic standards and certification processes imposed by foreign customers.

In particular, farmers may perceive both advantages and disadvantages from the use of certification (Gawron and Theuvsen 2006; Getz and Shreck 2006; Lazo, Jahn, and Spiller 2007; Dorr and Grote 2009; Hammoudi, Hoffman, and Surry 2009; Karipidis et al. 2009). Disadvantages may be especially relevant for farmers in developing countries, where legislation and institutions governing organic food production are usually weaker and farm resources more limited than in industrialized economies. Perceived costs associated with the use of organic certification and an unreliable inspection system may damage farmers' expectations of the performance of the control scheme, with detrimental consequences for farmer satisfaction. Dissatisfaction with the organic certification system may encourage farmers to change their certification agency or shift back to conventional agricultural practices, with the latter having negative implications for the private and public sector. In addition, dissatisfied farmers could also deter other potential customers through negative communication by word of mouth. In this context, it is useful to critically assess farmer satisfaction with the certification system and the factors driving it. Therefore, this research develops and analyses a structural equation model using data collected in Chile. In particular, this investigation tests the causal relationships in the proposed model using partial least squares (PLS) analysis. The following sections of this article provide information about determinants of satisfaction with quality assurance systems and describe the research hypotheses of the study, followed by the data collection procedure and statistical approach. The article then reports the results and discusses market and policy implications. Finally, this study draws conclusions for the organic sector in Chile.

Satisfaction with Certification Schemes and Reported Determinants

The core variable in this study corresponds to farmer satisfaction with organic certification. Satisfaction in this study is conceptualised as the affective reactions of individuals toward the use of organic certification. Satisfaction is defined as the fulfilment of certain prior expectations related to a product or service (Raboca 2006). Kotler and Keller (2006) similarly refer to satisfaction as "a person's feeling of pleasure or disappointment resulting from comparing a product's perceived performance (or outcome) in relation to his or her expectation". In other words, satisfaction reflects the degree to which a person believes that the position and/or use of a system evoke positive feelings (Rust and Oliver 1994).

to this regulation "the objective of this system is to ensure and certify that organic products are those elaborated, packed and handled in accordance with standards set by this Law and its Regulations".

[4] The agricultural census carried out in Chile in 2007 indicates that the area being utilized for livestock and agriculture activities is 29,781,690.81 ha (INE 2011).

Although customer satisfaction studies are restricted in many cases by monetary and time constraints, they are relatively common in the agrifood sector (e.g. Juhl, Kristensen, and Østergaard 2002; Gilbert et al. 2004; Mai and Ness 2006; Spiller, Bolten, and Kennerknecht 2006; Lülfs-Baden et al. 2008). However, there are few studies that address issues of farmer satisfaction with certification schemes in the food industry. Enneking, Obersojer and Kratzmair (2007) addressed the study of farmer satisfaction, and its determinants, with three different quality assurance systems in Germany. They reported that improvements in image, sales and production efficiency are key factors influencing famer satisfaction. Using regression analysis to assess organic farmers' acceptance of organic certification in Germany, Schulze, Jahn and Spiller (2007) found that the perceived bureaucratic costs, effectiveness and usefulness of organic certification are major factors determining farmer satisfaction. In addition, Schulze et al. (2008) reported that the cost/benefit ratio, the evaluation of the catalogue of requirements, the perceived communication of the standard owner, the perceived expertise of the auditor and the perceived costs of the certification significantly affect the overall evaluation of the International Food Standard. In this case, managers and quality assurance staff from European agrifood companies participated in the study. Using causal analysis to evaluate farmer satisfaction with organic certification in Germany, Schulze and Spiller (2010) also indicate that the perceived bureaucratic costs, effectiveness and usefulness of the system are key determinants of farmer satisfaction.

In the following, we present a model and a set of hypotheses that, from our perspective, can hypothetically describe the effects of several factors on farmer satisfaction with organic certification schemes. Unlike the study carried out by Schulze and Spiller (2010), this research further focuses on the analysis of the perceived reliability of organic certification and its potential drivers, as well as addressing farmers' perceptions in a less mature organic market, i.e. Chile.

Factors Influencing Farmer Satisfaction with Organic Certification

Perceived Reliability of Organic Certification

Despite the usefulness of TPC in reducing information asymmetry within the organic market, it is susceptible to opportunistic behaviour (e.g. the mislabelling of conventional foods as organic) (Giannakas 2002). Cases of mislabelling in the organic food sector have been reported by several authors (Giannakas 2002; Jahn, Schramm, and Spiller 2005). Given that the success of any certification system mainly depends on 'trust relationships' (Jahn Schramm, and Spiller 2005), opportunistic behaviour negatively affects consumer perception of the scheme and, therefore, has detrimental consequences for the market acceptance of organic food products (Giannakas 2002). In addition, occurrences of opportunistic behaviour can affect farmers' perception of the reliability of the control procedure. We define perceived reliability in this study as the respondent's judgement that the monitoring system is capable of detecting non-compliance with the organic standard. Perceived low reliability of organic certification may create conflicts and distrust amongst the different actors within the organic food supply chain on the one hand, and affect farmer loyaty and the adoption of the organic standard due to the scheme's low acceptance on the other hand. Therefore, we hypothesize that:

H_1: The greater the perceived reliability of the organic certification scheme, the greater the satisfaction with the organic certification process.

Perceived Benefits of Using Organic Certification

As mentioned above, customers of certification services may perceive benefits and costs of using certification standards. Benefits can be divided into internal (e.g. improvements in firm management, increasing income) and external benefits (market access and improved client relationships) (Karipidis et al. 2009). Unlike previous empirical studies (Schulze, Jahn, and Spiller 2007; Albersmeier, Schulze, and Spiller 2009; Schulze and Spiller 2010), we decompose the perceived benefit or usefulness of the certification system into three main constructs and evaluate their effects on satisfaction separately. Thus, we hypothesise that:

H_2: The better the perceived farm management, the greater the satisfaction with the organic certification process.

H_3: The better the perceived relationship with buyers and access to market, the greater the satisfaction with the organic certification process.

H_4: The higher the perceived farm income, the greater the satisfaction with the organic certification process.

Perceived Costs of Using Organic Certification

Certification incurs economic and bureaucratic costs. While bureaucratic costs are commonly related to the use of quality assurance schemes (Theuvsen 2004), economic costs also arise from the implementation of the standard (e.g. new infrastructure, personal training) and the fee customers must pay for the inspection service (Dorr and Grote 2009, Karipidis 2011). Schulze and Spiller (2010) found that bureaucratic costs negatively affect organic farmers' satisfaction in Germany. Similar results have also been reported in the German dairy system (Jahn and Spiller 2007b). The cost of the inspection fee is of special interest in developing countries because in most cases farmers must use internationally accredited inspection bodies, which increases the cost of certification (Barret et al. 2002; Vogl, Klicher, and Schmidt 2005). Considering this, we postulate that:

H_5: The higher the perceived economic costs, the lower the satisfaction with the organic certification process.

H_6: The higher the perceived bureaucratic costs, the lower the satisfaction with the organic certification process.

Experience in the Organic Sector

Empirical studies have reported that the number of years' experience in the organic sector significantly affect farmer satisfaction with organic certification in some Latin American countries (Albersmeier et al. 2009a). According to Ferguson, Wenssen and Storey (2005), less experienced organic growers in Canada are less satisfied with third-party organic certification. Based on this, we hypothesise that:

H_7: The more experience farmers in the organic sector have, the greater the satisfaction with the organic certification process.

Factors Influencing the Perceived Reliability of Organic Certification

Perceived Reputation of Inspectors and Certification Bodies

According to Jahn, Schramm and Spiller (2005) and Anders, Souza Monteriro and Rouviere (2007), the objectivity, experience and independence of the executive certification body (CB) are crucial determinants of the reliability of TPC. This is also valid for auditors or inspectors in charge of carrying out inspections at the producer's property. In developing countries supplying organic food products to high-value markets, reliable certification is critical (Anders, Souza-Monteiro, and Rouviere 2007). Nevertheless, the outbreak of food-borne diseases and continuous scandals affecting the food industry demonstrate that CBs and audit processes are sometimes susceptible to failure. Poor inspection quality may not only undermine the reputation of a particular CB or auditor but also negatively affect the reliability of the whole system because the probability of mislabelling is higher. In other words, the reliability of the certification process depends on the way auditing is carried out (Jahn, Schramm, and Spiller 2004b). However, the thoroughness of the audit process often varies considerably amongst different third-party certifiers (Jahn, Schramm, and Spiller 2005). Empirical evidence shows that there are significant differences between the auditing judgments issued by different certification bodies in the organic (Zorn, Lippert, and Dabbert 2010) and conventional food industries (Albersmeier et al. 2009). Considering this information, we hypothesise that:

H_8: The better the CB's reputation, the higher the perceived reliability of the organic certification scheme.

H_9: The better the auditor's reputation, the higher the perceived reliability of the organic certification scheme.

Perceived Risk of Fraud in the Organic Sector

Mislabelling and cheating in the organic sector can increase potential negative market effects (e.g. decrease in consumer demand). If farmers perceive that fraudulent practices by other growers are frequent in the organic sector, i.e. an increase in farmers' risk perception of fraud, they may negatively evaluate the reliability of the certification system. Therefore, we postulate that:

H_{10}: The higher the perceived risk of fraud in the organic sector, the lower the perceived reliability of the organic certification scheme.

Perceived External and Internal Sources of Pressure

Finally, some sources of internal and external pressure enforcing compliance with the organic standard may positively affect farmers' perception of the reliability of the certification process. In terms of organic certification, the government is the standard-setting institution (Garcia

Martinez and Bañados 2004). Therefore, we can expect that governmental institutions play a key role in monitoring compliance with the rules. Getz and Shreck (2006) highlight the importance of farm associations and farmers in enforcing compliance with organic standards. Furthermore, suppliers of organic products are under constant pressure because of the great number of different demands from customers (buyers) (Jahn, Schramm, and Spiller 2004b). Similar to farmer associations, the families of organic growers have a special interest in the correct functioning of the certification system since they may also suffer from economic losses in the event of fraud (Albersmeier, Schulze, and Spiller 2009). Considering this background, we hypothesise that:

H_{11}: The greater the perceived buyer pressure, the higher the perceived reliability of the organic certification scheme.

H_{12}: The greater the perceived government pressure, the higher the perceived reliability of the organic certification scheme.

H_{13}: The greater the perceived farmers pressure, the higher the perceived reliability of the organic certification scheme.

H_{14}: The greater the perceived family pressure, the higher the perceived reliability of the organic certification scheme.

Figure 1 summarises the proposed research model.

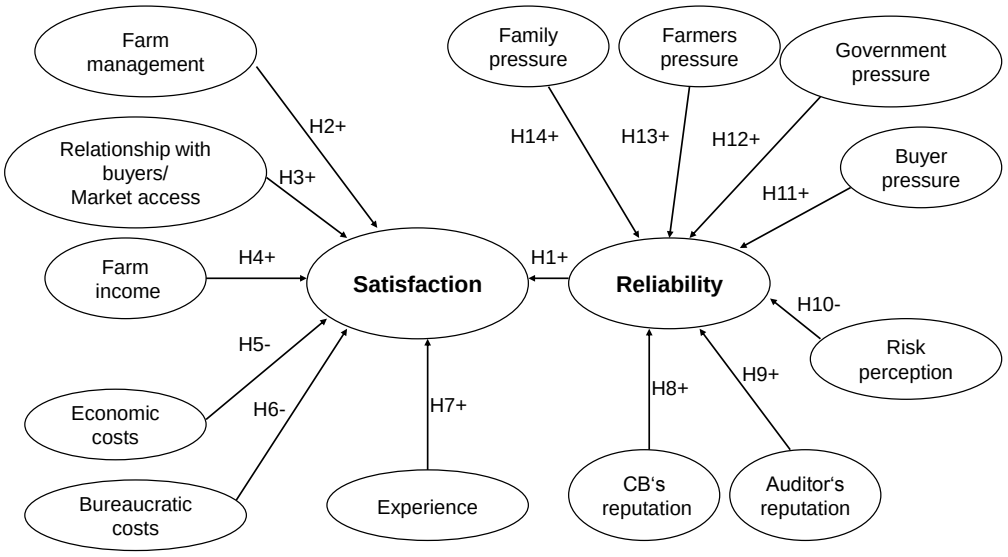

Figure 1. Research Model

Methodology

Data Collection

Between August and October 2008, face to face interviews were conducted in the Ñuble and Curicó provinces of Chile. A total of 60 subjects were consulted about their perceptions of

organic certification. In addition, the whole sample was composed of certified organic farms. With regard to the sampling procedure, respondents in this study were not randomly selected. Instead, a convenience sample was used. Therefore, the results reported in the following sections must be interpreted from an exploratory research perspective.

In order to test our hypotheses, a structured questionnaire with multiple scale items was designed. Personal and farm structure aspects were also recorded for each respondent. The questionnaire was designed in English. It was subsequently translated into Spanish and special attention was paid to ensure it contained wording typically used in Chile. Before administering the questionnaire, a pilot test was performed in order to check for inconsistencies.

Sample Description

The survey provided information from organic famers working with different types of berries (raspberry, blackberry, blueberry, etc.), vegetables and some major crops. In addition, most of the farms (87%) are affiliated to one of the most important certification bodies operating in the country (BCS ÖKO-GARANTIE GMBH). It was mainly farm owners (73.3%) that took part in the survey. Respondents who went to primary or secondary school accounted for 68.3%, while subjects holding a bachelor degree or who went to technical schools accounted for 30% and 1.7% respectively. On average, the subjects surveyed were 49.1 years old and had practiced organic farming for 7 years. The farms covered an area of 21.7 ha on average and the number of workers was on average 9.5. The high standard deviations for the number of ha and workers indicate that the sample includes both small and medium/large organic operations (Table 1). In terms of sales, almost half of the sample achieved less than $15 million Chilean pesos[5], while around 18% reached over $75 million. The rest of the respondents (30%) declared sales between $15 and $75 million. The majority of the respondents are organised as independent bodies (80%). The main marketing channels are the agroindustry (45%) and export companies (50%).

Table 1. Sample Characteristics.

Age (years)	Gender (female/male)	Experience with organic farming (years)	Size of farm (ha)	Number of workers/employees (#)
49.1	8/52	7.0	21.7	9.5
12.3[a]	13.3%/86.7%	*5.2*	*37.7*	*16.6*

[a] Standard deviation in *italics.*

Measures

Items used to capture the latent variables of the structural model (see Table 4 in Appendix) were adopted from measurement scales that have been tested in previous studies dealing with famers' acceptance and their assessment of different quality assurance systems (e.g. Jahn and Spiller 2007a, 2007b; Schulze, Jahn, and Spiller 2007). The selected statements or items were assessed by respondents on a seven-point Likert scale (-3 'totally disagree', -2 'disagree', -1 'partially disagree', 0 'neither agree nor disagree', +1 'partially agree', +2 'agree', +3 'totally agree'). All were examined beforehand using exploratory factor analysis (principal component analysis,

[5] USD$ 1 = Chilean pesos $ 518.66. Central Bank of Chile (www.bcentral.cl) (accessed on 21st December 2011).

VARIMAX rotation). Items with double loading and those loading on improper factors were excluded from further analysis.

Statistical Approach

Structural equation modelling (SEM) is a general analytic framework that allows the identification of causal relationships through the combination of multiple regression, path analysis, and confirmatory factor analysis (Tomarken and Waller 2005). Estimation of causal models with latent constructs can be performed either by covariance-based or variance-based SEM techniques (Gefen, Straub, and Boudreau 2000; Reinartz, Haenlein, and Henseler 2009). In this study, partial least squares (PLS), a variance-based method, was used because it is appropriate for exploratory studies with small sample sizes and relaxes the distributional assumptions required by covariance-based approaches (Gefen, Straub, and Boudreau 2000; Henseler, Ringle, and Sinkovics 2009; Reinartz, Haenlein, and Henseler 2009; Hair, Ringle, and Sarstedt 2011). The analysis and interpretation of PLS models comprises two steps: i) the assessment of the reliability and validity of the measurement model (outer model); and ii) the assessment of the goodness of fit of the structural model (inner model) (Hulland 1999; Henseler, Ringle, and Sinkovics 2009; Hair, Ringle, and Sarstedt 2011). The statistical software SmartPLS version 2.0 M3 (Ringle, Wende, and Will 2005) was used to analyse the data.

Results

Satisfaction with Organic Certification

The majority of respondents seem to be satisfied with the organic certification process. While 23.3% and 36.7% partially agree or agree, 30% totally agree with the statement "*I am satisfied with the organic certification scheme*".

Reliability and Validity of the Measurement Model

The reliability of the measures takes into account the factor loadings of each measurement item on their respective latent construct (see Table 4 in Appendix). The majority of measure loadings are consistent with the recommended value of 0.7 (Chin 1998a; Hulland 1999; Henseler, Ringle, and Sinkovics 2009; Hair, Ringle, and Sarstedt 2011).

The evaluation of construct reliability considers Cronbach's alpha and composite reliability (Table 2). However, Cronbach's alpha usually exaggerates the unreliability of measurements and thus composite reliability provides a better judgement of construct reliability (Baumgartner and Homburg 1996; Henseler, Ringle, and Sinkovics 2009; Hair, Ringle, and Sarstedt 2011). No matter which reliability coefficient is used, the recommended threshold for sufficient construct reliability in early stages of research is 0.7 or above (Nunnally and Bernstein 1994). Convergent validity considers the evaluation of average variance extracted (Fornell and Larcker 1981). This research reports satisfactory values (greater than 0.5) for average variance extracted for all the assessed constructs. In other words, the latent variables are able to explain more than half of their indicators' variance on average.

Table 2. Assessment of the measurement model.

Variables	N° items	CRA[a] (>= 0.7)	CR[b] (>= 0.7)	AVE[c] (>=0.5)
Auditor's reputation	3	0.53	0.76	0.52
Bureaucratic costs	3	0.58	0.77	0.53
Buyers pressure	2	0.63	0.84	0.73
Relationship with buyers/Market access	4	0.80	0.86	0.61
CB's reputation	2	0.40	0.75	0.61
Economic costs	2	0.62	0.82	0.70
Experience	1	1.00	1.00	1.00
Family pressure	1	1.00	1.00	1.00
Farm income	2	0.56	0.81	0.69
Farm management	3	0.57	0.76	0.53
Farmer pressure	3	0.61	0.79	0.56
Government pressure	1	1.00	1.00	1.00
Reliability	3	0.62	0.79	0.57
Risk perception	3	0.59	0.77	0.52
Satisfaction	1	1.00	1.00	1.00

[a] Cronbach's alpha.
[b] Composite reliability.
[c] Average variance extracted.

Discriminant validity considers the performance of the Fornell-Larcker criterion (Fornell and Larcker 1981) and the evaluation of cross loadings. The Fornell-Larcker criterion postulates that a latent construct should share more variance with its assigned indicators than with another latent variable in the structural model (Hair, Ringle, and Sarstedt 2011). We found no evidence of correlation between any two latent constructs larger than the square root of the average variance extracted from these two constructs (see Table 5 in Appendix). A second criterion requires that an indicator's loading with its associated construct should be higher than its loadings with all the remaining constructs (Hair, Ringle, and Sarstedt 2011). Data analysis shows that there is no evidence of cross loadings (data not shown). Therefore, discriminant validity is supported, which means that all constructs in the research model are indeed measuring different concepts.

Goodness of Fit of the Structural Model and Determinants of Satisfaction

The assessment of goodness of fit for the model focuses on R^2 scores and the algebraic sign, size and significance of the path coefficients (Baumgartner and Homburg 1996; Henseler, Ringle, and Sinkovics 2009; Hair, Ringle, and Sarstedt 2011). There is good structural fit for the model when i) there is high explanatory power (R^2) and ii) there are statistically significant t-values associated with the path coefficient estimates.

The structural model explained 51% of the variance in the perceived reliability of the organic certification process and 47% of the variance in satisfaction. In PLS models, R^2 scores of 19, 33 and 67% are considered weak, moderate and substantial respectively (Chin 1998b). Recently, Hair, Ringle and Sarstedt (2011) provided more restrictive criterion for assessing R^2 values (25, 50, and

75%). Given the explorative character of this study and the small sample size, reported R^2 values in this study are acceptable.

The significance of path estimates (Table 3) was determined by using the SmartPLS bootstrapping routine with 5,000 sub-samples and 60 cases (Henseler, Ringle, and Sinkovics 2009; Hair, Ringle, and Sarstedt 2011).

Table 3. Structural path estimates.

	Variables	Endogenous constructs	Parameter estimate	Standard error	*t*-statistic
	Perceived reliability				
H1	Reliability	Satisfaction	0.06	0.17	0.34^{ns}
	Perceived benefits				
H2	Farm management	Satisfaction	0.18	0.14	1.28^{ns}
H3	Relationship with buyers/Market access	Satisfaction	0.20	0.15	1.32^{ns}
H4	Farm income	Satisfaction	0.38	0.12	3.11**
	Perceived costs				
H5	Economic costs	Satisfaction	-0.05	0.10	0.48^{ns}
H6	Bureaucratic costs	Satisfaction	-0.22	0.10	2.13*
	Experience in the organic sector				
H7	Experience	Satisfaction	-0.03	0.09	0.36^{ns}
	Perceived reputation				
H8	CB's reputation	Reliability	0.18	0.17	1.08^{ns}
H9	Auditor's reputation	Reliability	0.19	0.18	1.04^{ns}
	Perceived risk of fraud in organic sector				
H10	Risk perception	Reliability	-0.30	0.12	2.53*
	Perceived external and internal pressure				
H11	Buyers pressure	Reliability	0.32	0.15	2.15*
H12	Government pressure	Reliability	0.14	0.14	1.00^{ns}
H13	Farmer pressure	Reliability	0.30	0.11	2.78**
H14	Family pressure	Reliability	-0.12	0.13	0.95^{ns}

* Parameter is significant at $p < 0.05$; **parameter is significant at $p < 0.01$; *** parameter is significant at $p < 0.001$; ns = parameter is not significant.

The results reveal that among the perceived benefits, the perceived improvement in farm income due to the use of organic certification shows a significant influence on farmers' satisfaction. In addition, this variable has the highest impact on satisfaction in the model. Although other perceived benefits show the expected sign, they are not significant. As postulated, the costs associated with the certification process, i.e. economic and bureaucratic costs, negatively affect farmer satisfaction. Nevertheless, only bureaucratic costs significantly affect this endogenous variable. Surprisingly, the perceived reliability of the certification process is not a significant determinant of satisfaction. The perceived risk of fraud in the organic sector and external as well as internal sources of monitoring arise as significant determinants of the perceived reliability. To an even greater extent, the perceived monitoring by buyers is the most important factor affecting reliability. Neither the perceived reputation of the auditor nor the perceived reputation of the CB

significantly influences the perceived reliability of the organic scheme, although they show the expected sign.

Discussion with a Focus on Market and Policy Implications

The findings of this study must be analysed with caution. The explorative character of this research limits the interpretation of the results to the sample we analysed in the Chilean case. Nevertheless, important lessons can be taken from this study.

Satisfaction with Organic Certification

The results show a high level of farmer satisfaction with organic certification. In other words, the performance of the certification scheme meets farmers' expectations. This is supported by the fact that the majority of the subjects surveyed (71.7%) have never changed their CB (data not shown). Previous empirical evidence indicates that farmers' acceptance of the organic certification scheme is higher and less controversial in Latin American countries than in more developed organic food markets (Albersmeier, Schulze, and Spiller 2009). This is a good signal for the CBs operating in the region because the long term competiveness and success of firms depends to some extent on customer loyalty to the product or service, which is in turn shaped by customer satisfaction (Bayol et al. 2000; Spiller, Bolten, and Kennerknecht 2006; Lülfs-Baden et al. 2008 Anderson and Swaminathan 2011). However, as mentioned previously, 87% of the farms surveyed are affiliated to the same single CB. This fact prevents the development of a clear picture of the assessment of the organic certification process by organic farmers affiliated to other CBs. Empirical evidence shows that there are differences between the auditing judgments of different CBs in the organic food industry (Zorn, Lippert, and Dabbert 2010). In addition, Ferguson, Wenssen and Storey (2005) point out that there are large differences in farmers' satisfaction across different CBs in the Canadian organic market. Therefore, future studies analysing farmer satisfaction with organic certification should consider the use of a more heterogeneous sample in terms of CBs. Another limitation in relation to this sample is the fact that it did not consider farmers who reverted back to conventional agriculture. Additionally, given that satisfaction is a complex multidimensional construct (Raboca 2006), further investigations should include more statements to assess farmer satisfaction. This could provide a more accurate evaluation.

Determinants of Satisfaction

Surprisingly, the perceived reliability of organic certification is not a significant predictor of farmer satisfaction in this study. Maybe the perceived good reputation of CBs (or at least BCS ÖKO-GARANTIE GMBH) and auditors (see Table 4 in Appendix), as well as the absence of major public scandals in the local organic industry, may be focusing the attention of local farmers on other factors (e.g. perceived benefit in terms of farm income) when assessing their expectations regarding the use of organic certification.

The findings also indicate that the perceived benefits are more important than the perceived costs. Previous studies have reported similar results in the conventional food industry (e.g. Enneking, Obersojer, and Kratzmair 2007). However, the picture seems to be different for small farmers (Karipidis et al. 2009). As previously mentioned, the perceived benefit in terms of farm income is

the most important factor affecting satisfaction. This is not unusual because Chile's organic production is export-oriented and therefore deals with high-value markets (Garcia Martinez and Bañados 2004). Moreover, there is evidence from Latin America indicating that farmers who have adopted certification schemes have a higher net income compared with non-certified farmers (Dorr and Grote 2009). The findings also reveal that other potential benefits such as a good relationship with buyers, market access and improvement in farm management may not have been well communicated to organic farmers so far. Access to information and good communication promotes the adoption of certification standards (Dorr and Grote 2009). If local policy makers aim to encourage the adoption and increase acceptance of the organic control scheme in Chile then they should properly communicate the benefits associated with the use of it. This matter is particularly critical when considering small farmers, who normally have more difficulty accessing information.

As expected, farmers perceive the certification process as a bureaucratic burden negatively influencing farmer satisfaction. Although this finding is in line with previous studies carried out in developed food markets (e.g. Theuvsen 2004; Jahn and Spiller 2007b; Schulze and Spiller 2010), there is also contradictory empirical evidence reported in developing countries (Lazo, Jahn, and Spiller 2007). The use of farmer associations might be a way to reduce bureaucracy (Getz and Shreck 2006) because it allows economies of scale and reduces transaction costs. Reaching equivalence[6] between Chile's organic law and the standards ruling the most important organic markets might also mitigate the bureaucratic process. According to Barret et al. (2002), being recognized as a 'Third Country' by EU organic legislation facilitates the export process by reducing bureaucracy. However, the process of harmonization for organic regulations should consider differences in regional farming techniques and integrate the knowledge of local farmer groups to ensure effective environmental and health protection goals (Vogl, Klicher, and Schmidt 2005). In addition, the integration of regional or local aspects during the process of harmonization would help to guarantee the participation of small farmers in the international organic market and promote sustainable development in organic farming. Another way to reduce bureaucratic costs and, consequently, increase satisfaction with the organic control scheme is the encouragement of direct marketing through the establishment of local farmer markets. In terms of direct local marketing, no equivalence of national organic rules with European, etc., regulations is needed (Vogl, Klicher, and Schmidt 2005). Nevertheless, the establishment of direct marketing channels in less developed organic markets needs to be accompanied by a promotional strategy for organic food in order to capture local consumer attention and ensure a minimum level of consumer demand.

Although the perceived economic costs have a negative influence on farmer satisfaction, they do not exert a significant effect. The use of only one construct dimension (certification fee) may have affected the performance of this variable in this study. Thus, future studies should incorporate more variables associated with economic costs (e.g. costs related to new infrastructure, personal training) into the analysis. This could provide a clearer picture of the impact of economic costs on satisfaction.

[6] Equivalence means that the norms regulating the production, processing, documentation, inspection and certifications systems in import markets are equally as effective as those in export markets, but not necessarily that they have to be identical (Garcia Martinez and Bañados 2004).

Determinants of Perceived Reliability

As the findings show, the reliability of the certification scheme depends on several factors. The perceived external control carried out by buyers and the perceived internal control undertaken by farmers or farmer associations both play a critical role in determining reliability. This is consistent with the findings of Albersmeier, Schulze and Spiller (2009), who point out that these types of organisations can perform a social monitoring function. In addition, they are more effective in this aspect than public authorities in Latin American countries. This indicates that the responsibility for monitoring is moving from the public sector to non-state actors. As Hatanaka and Busch (2008) argue, "the state is withdrawing from direct oversight and monitoring, and increasingly regulating food and agriculture indirectly". Also, the lack of harmonization between the local organic legislation and those standards demanded by export markets (e.g. EU and USA), the existence of weak institutional regulatory structures and the undeveloped character of domestic organic markets in several Latin American countries may help to explain the perceived poor performance of the public sector as a monitoring body.

The risk perceived by farmers regarding fraud practices in the organic sector is also a determinant of the perceived reliability. This is not unusual since opportunistic behaviour and cheating in the organic food business, including third-party inspection activities, are still an important area of discussion in the international arena (Giannakas 2002; Jahn, Schramm, and Spiller 2005; Hatanaka and Busch 2008).

Unlike the suggestions from previous studies (e.g. Jahn, Schramm, and Spiller 2004b; Jahn, Schramm, and Spiller 2005; Anders, Souza-Monteiro, and Rouviere 2007; Albersmeier, Schulze, and Spiller 2009), neither the perceived reputation of the inspector nor the perceived reputation of the CB determine the perceived reliability of the organic control scheme in the research model. However, the results partially agree with those reported by Schulze and Spiller (2010) in Germany, who concluded that neither the perceived thoroughness of the CB nor the perceived expertise of the auditor significantly affect the effectiveness of the organic control system. Although the items used to evaluate CB and auditor reputation in this study were adapted mainly from earlier empirical research, the number of latent constructs describing these factors differs from those used in other studies. Therefore, differences in model specification may partially explain the variation in results. Another explanation is the fact that the majority of farms surveyed in this study are affiliated to the same CB, which apparently seems to enjoy a good reputation. Either way, the effect of reputation issues on farmer satisfaction deserves more empirical research at a local market level.

Conclusions

According to the findings of this study, organic farmers in Chile are satisfied with organic certification. However, extending this result to the whole domestic organic industry requires an analysis of a more heterogeneous sample.

Perceived benefits are more important determinants of farmer satisfaction than perceived costs, as the perceived improvement in farm income is the most important variable driving satisfaction and the perceived bureaucratic cost is the central barrier to increasing the acceptance of the organic control scheme. In this context, public authorities and other stakeholders may play a central role

in reducing bureaucracy by e.g. negotiating equivalence of the local legislation. In this way, farmer satisfaction with and acceptance of the monitoring system may increase. Adequate communication of other potential benefits (e.g. market access) may also help to increase farmer satisfaction.

Surprisingly, the perceived reliability of organic certification does not play an important role in determining farmer satisfaction. However, this may be an unusual case in the organic food industry, due to the apparently good reputation of the main CB in this study and the absence of major public scandals in Chile's organic industry, which may focus the attention of farmers on other factors.

The findings also reveal that the perceived performance of the state as a monitor is poor. In contrast, customer (buyer) demands and the internal control carried out by farmers or farmer associations both suggest that the industry is able to self-regulate its monitoring activities.

Contrary to the evidence reported in the literature, neither the perceived reputation of the inspector nor the perceived reputation of the CB determines the perceived reliability of the organic control scheme. However, more evaluations at a local market level should provide support to validate this argument.

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Appendix 1

Table 4. Measurement items for the variables in the research model

Variables and measurement items[a]	Mean	Standard deviation	Factor loading[b]
Satisfaction with organic certification			
I am satisfied with the organic certification scheme.	1.68	1.41	1.00
Perceived reliability of organic certification			
The certification process is reliable.	1.58	1.36	0.86
Cheaters are discovered during the inspections.	0.78	1.65	0.77
Inspectors are able to notice if other farmers sometimes do not follow the guidelines.	1.27	1.38	0.60
Perceived benefits			
Farm management			
Organic certification standards enhance the effectiveness of my organic practices.	1.57	1.43	0.87
The auditor gives me good ideas to improve the management of my farm.	1.05	1.90	0.69
The organic certification standard improves my productivity.	0.67	1.82	0.59
Relationship with buyers/Market access			
The direction our business is going in became clearer through the certification process.	2.03	1.15	0.84
I have a better relationship with my buyers since I got organic certification.	1.90	1.35	0.83
Since I farm organically, my business relations have increased.	1.80	1.56	0.81
I need organic certification to be able to sell my products.	2.20	1.26	0.63
Farm income			
My income has increased since I got organic certification.	0.78	1.74	0.90
I had more gains with conventional agriculture than with organic agriculture.[c]	0.92	1.81	0.75
Perceived costs			
Economic costs			
The fee for the certification process is not so high.[c]	1.48	2.02	0.96
The cost for the organic certification scheme is too high.	2.48	0.85	0.69
Bureaucratic costs			
The time expenditure for the certification process is too high.	0.38	2.09	0.82
The organic certification control system is very bureaucratic.	1.62	1.49	0.78
The required documentation for the organic certification scheme is too much.	0.42	2.04	0.56
Experience in the organic sector			
Experience[d]			
For how many years have you been practicing organic agriculture?	7.0	5.2	1.00
Perceived reputation			
CB's reputation			
I chose this CB because it has a good reputation.	1.20	1.25	0.92
In comparison to other CBs ours is more thorough.	0.45	1.13	0.61
Auditor's reputation			
The performance of the auditor during the inspection is very correct.	1.80	1.12	0.88
Our auditor tries to find the weak points in my farm.	1.95	0.95	0.65
The auditor is an expert in organic production.	1.07	1.76	0.61

(Continued)

Table 4. (Continued)

Variables and measurement items[a]	Mean	Standard deviation	Factor Loading[b]
Perceived risk in the organic sector			
Risk perception			
Nowadays there are more farmers who do not follow the organic guidelines.	-0.30	1.28	0.76
Not every organic farmer has the same level of reliability.	1.72	1.22	0.72
I do not believe that all organic producers are trustworthy.	1.63	1.18	0.70
Perceived external and internal sources of pressure			
Buyers pressure			
My buyer warns me frequently about the consequences of cheating.	1.37	1.86	0.88
My buyer makes sure that I keep close to the guidelines.	1.68	1.75	0.82
Government pressure			
The government does not monitor if farmers comply with organic certification.	0.90	1.69	1.00
Farmers pressure			
If my neighbours discover that I am doing something wrong they would report me.	1.27	1.73	0.84
My organic certified neighbours monitor that I comply with the requirements of the certification.	0.00	1.77	0.69
Producers are aware that if any of them cheat then it could be detrimental to the name of the association.	2.18	1.10	0.71
Family pressure			
My family cares that I fulfil the requirements of organic farming.	1.85	1.39	1.00

[a] Respondents assessed each item using a seven-point Likert scale with totally disagree (-3) and totally agree (+3) as anchors.
[b] Results of the PLS confirmatory factor analysis.
[c] A negative statement, the scale items were reverse coded.
[d] Years.

Appendix 2

Table 5. Discriminant validity analysis based on the Fornell Larcker criterion.

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Auditor's reputation	**0.72**[a]														
2. Bureaucratic costs	-0.01	**0.73**													
3. Buyers pressure	0.20	0.03	**0.85**												
4. Relationship/Market a.	0.36	-0.27	0.31	**0.78**											
5. CB's reputation	0.52	0.00	0.31	0.36	**0.78**										
6. Economic costs	-0.10	0.01	-0.01	-0.15	-0.09	**0.84**									
7. Experience	0.09	0.04	-0.08	0.11	0.26	-0.08	**1.00**								
8. Family pressure	0.45	-0.03	0.32	0.44	0.48	-0.13	0.11	**1.00**							
9. Farm income	0.43	0.02	0.30	0.43	0.24	-0.10	0.25	0.31	**0.83**						
10. Farm management	0.38	-0.09	0.39	0.35	0.45	-0.13	0.01	0.43	0.27	**0.73**					
11. Farmer pressure	-0.01	0.04	0.32	0.11	0.00	-0.04	-0.33	0.22	-0.08	0.30	**0.75**				
12. Government pressure	-0.22	-0.03	-0.17	-0.05	-0.18	0.13	-0.11	-0.07	-0.36	-0.29	-0.08	**1.00**			
13. Reliability	0.33	-0.22	0.49	0.48	0.32	-0.24	-0.01	0.28	0.24	0.43	0.46	-0.05	**0.75**		
14. Risk perception	-0.24	0.16	-0.15	-0.30	-0.07	0.17	-0.01	-0.22	-0.32	-0.29	-0.34	0.14	-0.46	**0.72**	
15. Satisfaction	0.36	-0.30	0.21	0.52	0.35	-0.16	0.08	0.62	0.52	0.41	0.15	-0.21	0.38	-0.33	**1.00**

[a] Diagonal values in bold are the square roots of the average variance extracted.
CB: Certification body.