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**Certification logos in the market for organic food:  
What are consumers willing to pay for different logos?**

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**Paper prepared for presentation at the EAAE 2011 Congress**  
**Change and Uncertainty**  
Challenges for Agriculture,  
Food and Natural Resources

August 30 to September 2, 2011  
ETH Zurich, Zurich, Switzerland

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## Abstract

Organic food is often labelled with an organic certification logo to gain consumer trust in the product integrity. The number of different organic certification logos in the European market raises the question whether consumers prefer specific logos over others. The aim of this paper is to analyse consumers' willingness-to-pay (WTP) for different organic logos to give recommendations for actors in the organic sector. Choice experiments and structured interviews were conducted with 2,441 consumers of organic food in six European countries. The data was analysed with random parameter logit models. We found great differences between the tested logos regarding the price premium that consumers were willing to pay. The highest WTP was recorded for well-known logos that consumers perceived as credible with high production standards and a strict control system. It is thus recommended for suppliers of organic food to label products with an organic logo preferred by consumers. Organisations owning an organic logo should put effort into measures for increasing consumer awareness of the logo and forming consumer perceptions of the certification scheme behind it.

## Keywords

Organic logos, willingness-to-pay, credence goods, random parameter logit models

## 1 Introduction

In the market for organic food, consumer trust is a crucial issue since consumers are not able to verify whether or not a product is an organic product, not even after consumption. Organic products must be produced according to organic principles, which refer to the production process rather than to the end-product (Jahn *et al.*, 2005). In information economics, product attributes of this kind are called 'credence attributes' and the corresponding products 'credence goods' (Darby & Karni, 1973). Consumer trust in the product integrity of credence goods is of crucial importance, in particular if the credence attribute involves a price premium like in the case of organic food (Golan *et al.*, 2001). An instrument to gain consumer trust in credence goods markets is third-party certification of the supply-side (Roe & Sheldon, 2007). Organic certification has a long tradition in many European countries. Organic certification logos on product packages and/or price tags are used to signal consumers at the point-of-sale that a product is a certified organic product.

In the European Union (EU), only those products can be labelled and sold as organic food that comply with and are certified according to the principles of organic production, certification and labelling of Regulation (EC) No 834/2007. Since July 2010, all prepacked organic products produced and sold in the EU must be labelled with the new mandatory EU logo (Regulation (EU) No 271/2010).<sup>1</sup> The new logo replaced the old voluntary EU logo. Besides the EU logo, there are several other organic certification logos in many European countries, which are owned by different kinds of organisations. These can be differentiated into governmental logos on the one hand and logos of private organisations on the other hand. Governmental logos are found in some but not in all European countries (e.g. Danish 'Red Ø' logo, German 'Bio-Siegel'). Private organisations with own organic certification logos are farmers' associations (e.g. Demeter, Soil Association), umbrella organisations of the organic farming sector (e.g. Bio Suisse) and control bodies (e.g. Ecocert).

Organic certification logos target the final consumer (Jahn *et al.*, 2005). From a marketing perspective, the variety of different organic logos in the market raises the question whether consumers prefer products with *specific* organic certification logos. Furthermore, it is of interest how consumer preferences are influenced by consumer awareness and perceptions of

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<sup>1</sup> A transition period is granted until 2012 (Regulation (EU) No 271/2010).

the logos. These questions are not only relevant for organisations owning an organic certification logo but also for producers, processors and retailers in the organic market. To the author's knowledge, little scientific evidence exists regarding consumer preferences for *specific* organic logos. While several studies investigated the price premium that consumers are willing to pay for organic food, most of these studies either used a single organic logo or the word 'organic' to distinguish organic from conventional products (see e.g. Hoogland *et al.*, 2007; Scarpa & Thiene, 2007; Teratanavat & Hooker, 2006; Loureiro *et al.*, 2001).

The objective of this contribution was to investigate consumer preferences and willingness-to-pay for different organic certification logos in six European countries to give recommendations for market actors in the organic sector. By means of choice experiments and structured interviews it was determined whether and which organic certification logos are preferred by consumers. Furthermore, it was analysed how the logo choice is influenced by consumer awareness and perceptions of different organic logos.

The contribution is organised as follows: In Section 2, the theoretical concept of product labelling and third-party certification in credence goods markets is discussed with reference to organic certification logos. In Section 3, the survey design and the econometric model of choice analysis are outlined. In Section 4, the results of the model estimations are presented and discussed. In Section 5, recommendations for market actors in the organic sector are made and conclusions are drawn regarding product labelling in credence goods markets.

## **2 Product labelling and third-party certification in credence goods markets**

Credence goods markets like the market for organic food feature a high degree of information asymmetry, since consumers are not able to verify whether or not a product was produced according to the promised characteristics (Darby & Karni, 1973). Due to the uneven distribution of information between the supply side and the consumer side, credence goods markets are prone to fraud and opportunistic behaviour in the supply chain and might thus suffer from a lack of consumer trust (Darby & Karni, 1973). One way to overcome the dilemma of information asymmetry is third-party certification (McCluskey, 2000). Neutral certifiers, which are accredited by competent authorities, guarantee regular inspections of the processes within the supply chain and ensure compliance with the respective production standards (Jahn *et al.*, 2005). Many certification schemes have an own logo which certified producers and processors can use to label their products, so that consumers are able to identify certified products at the point-of-sale (Golan *et al.*, 2001; Roe & Sheldon, 2007).

The underlying assumption of third-party certification is that consumers have greater trust in independent certifiers than in private producers and processors (Albersmeier *et al.*, 2010). However, with regard to organic food, several studies found that some consumers were sceptical about the integrity of organic products, which prevented them from buying more organic food (Aertsens *et al.*, 2009; Hughner *et al.*, 2007). Likewise, several authors suggested that consumer trust in the certification scheme is the prerequisite for third-party certification to diminish the dilemma of information asymmetry in the producer-consumer relationship (Golan *et al.*, 2001; Jahn *et al.*, 2005; Albersmeier *et al.*, 2010). Our contribution investigates this aspect in the context of organic certification logos. At the point-of-sale, organic certification is signalled to consumers by product labelling, either with the written prefix 'organic' or with additional organic certification logos. We elicit whether *specific* organic certification logos are more successful than others in overcoming the dilemma of information asymmetry inherent in credence good.

### 3 Methods

Choice experiments were conducted to elicit consumers' willingness-to-pay (WTP) for different organic certification logos. In subsequent structured interviews, data was collected on factors that might influence the WTP. The study was conducted with 2,441 consumers of organic food in the six European countries Czech Republic (CZ), Denmark (DK), Germany (DE), Italy (IT), Switzerland (CH) and United Kingdom (UK). The data was analysed with random parameter logit models. In marketing research, choice experiments are often used to determine what consumers are willing to pay for different product attributes (Hensher & Greene, 2003). In choice experiments, participants are asked to make a choice out of a set of different product alternatives (Lusk & Schroeder, 2004). One advantage of this method is that choice experiments are more similar to a real buying situation compared to other methods for analysing the WTP for product attributes (e.g. contingent valuation, auctions). Choice experiments are based on Random Utility Theory (Thurstone, 1927) postulating that an individual who makes a choice among different alternatives strives to maximise utility. The individual thus chooses the one alternative that provides him/her with the highest utility (Louviere *et al.*, 2000; McFadden, 1974). In accordance with Lancaster's Consumer Theory (Lancaster, 1966), it is assumed that the utility of a product stems from the different product attributes.

#### 3.1 Survey design

The choice experiments were conducted with two different kinds of products: organic apples and eggs. These two products were chosen since it was intended to investigate both a plant and an animal product. Furthermore, many consumers regularly buy apples and eggs and these products are available from domestic production in the study countries. Each participant was presented with two choice sets of organic apples and two choice sets of organic eggs. The four product alternatives within a choice set looked identically but were marked with different organic logos and prices. In addition, the participants were also free to refrain from buying any of the offered alternatives ("no-buy option"). The no-buy option was included to make the buying decision more realistic. Furthermore, previous studies showed that forced choice might lead to biased results (Dhar & Simonson, 2003). In each study country, four different organic labels were tested (Table 1). The choice experiments were designed as so-called labelled experiments, i.e. each label was present in each choice set. The selection of the organic logos used in the experiments was based on a preceding qualitative study with focus group discussions (Janssen & Hamm, 2011). In each country, only those logos were included which existed in the market and could be used on domestic products.<sup>2</sup>

**Table 1: Organic logos used in the choice experiments**

Country	Label 1	Label 2	Label 3	Label 4
CH	Bio Suisse <sup>1</sup>	Faked logo <sup>2</sup>	Demeter <sup>3</sup>	
CZ	Old EU logo <sup>4</sup>	Governmental logo	Demeter	
DE	Old EU logo	Governmental logo	Demeter	Without logo
DK	Old EU logo	Governmental logo	Demeter	
IT	Old EU logo	CCPB <sup>5</sup>	Demeter	
UK	Old EU logo	Soil Association <sup>6</sup>	OF&G <sup>7</sup>	

<sup>1</sup> Umbrella organisation of farmers' associations.

<sup>2</sup> Referring to the Suisse governmental organic regulation.

<sup>3</sup> International farmers' association.

<sup>4</sup> The old EU logo was used since the survey was conducted before the new mandatory EU logo was introduced.

<sup>5</sup> CCPB=Certificazione e controllo prodotti biologici. Italian certification body.

<sup>6</sup> British farmers' association.

<sup>7</sup> OF&G=Organic Farmers & Growers. British certification body.

<sup>2</sup> In Switzerland, only two common Swiss organic certification logos are currently found in the market (Bio Suisse and Demeter). Therefore, a faked logo was created referring to the Swiss organic regulation.

The products were offered at four different price levels. The relative price levels were the same in all countries: 1.00, 1.25, 1.50, 1.75. The absolute prices used in the experiments were based on the average market price of organic apples/eggs in the respective survey regions one month before the experiments were conducted (the average market price equals price level 1.25). The experimental design for the systematic variation of the price levels across the four label alternatives was based on a fractional factorial design with 16 different choice sets for apples and eggs respectively (developed with the software package SPSS). The sample was divided into eight blocks.

The choice experiments were designed to resemble a real buying situation. Real organic apples and eggs were presented. Typical product information, which was identical across the alternatives, was shown on the price tags (apples: variety, domestic origin; eggs: egg size, domestic origin). Furthermore, the participants were instructed that they would have to pay for the chosen products just like in a real shop to reduce the hypothetical bias (Lusk & Schroeder, 2004).

In the structured interviews conducted after the choice experiments, the participants were asked to rate each tested label regarding awareness, credibility, organic standards and the control system. Finally, data on socio-demographic characteristics were collected.

### 3.2 Econometric model

The random parameter logit (RPL) model used in this research is a generalised form of the multinomial logit model. Separate RPL models were estimated for apples and eggs with the software package NLOGIT 4.0. The WTP for the tested organic logos was based on the following utility functions:

$$\begin{aligned}
 U_{label1} &= V_{label1} + \varepsilon_{label1} = ASC_{label1} + \beta_{PRICE} PRICE + \varepsilon_{label1} \\
 U_{label2} &= V_{label2} + \varepsilon_{label2} = ASC_{label2} + \beta_{PRICE} PRICE + \varepsilon_{label2} \\
 U_{label3} &= V_{label3} + \varepsilon_{label3} = ASC_{label3} + \beta_{PRICE} PRICE + \varepsilon_{label3} \\
 U_{label4} &= V_{label4} + \varepsilon_{label4} = \beta_{PRICE} PRICE + \varepsilon_{label4} \\
 U_{No-buy} &= V_{No-buy} + \varepsilon_{No-buy} = ASC_{No-buy} + \varepsilon_{No-buy}
 \end{aligned}$$

The WTP was calculated by dividing the alternative specific constant of a logo by the price coefficient as suggested by Lusk & Schroeder (2004):

$$WTP_i = ASC_i / \beta_{PRICE}$$

This WTP measure provides the *additional* WTP for apple/eggs with a specific logo compared to organic apples/eggs without a logo, since we defined the *ASCs* in relation to the alternative without a logo (=label 4) in the above utility functions. The WTP was based on relative price levels (1.00; 1.25; 1.50; 1.75) in order to make the WTP measures comparable across the study countries. Therefore, the values of the WTP measures cannot be interpreted in monetary terms but only relative to each other.

While the basic multinomial logit model assumes the estimated parameters to be fixed in the population, the random parameter logit (RPL) model (also called mixed logit model) allows preference heterogeneity in the population, i.e. the  $\beta_k$  coefficients and *ASCs* can vary across individuals (Hensher & Greene, 2003). For these so-called random parameters both the mean and the standard deviation are estimated. For each parameter, it can be determined whether the parameter is random or fixed by checking whether the model provides a significant estimate of the standard deviation (Hensher *et al.*, 2005). During the process of RPL model specification, we checked all *ASCs* for a significant standard deviation. In RPL models, the researcher has to make an assumption regarding the distribution of each random parameter (e.g. normal, lognormal, uniform, triangular distribution) (Hensher & Greene, 2003). We

assumed the random ASCs to be normally distributed. The generic price coefficient was estimated as a fixed parameter, since random price parameters often result in an overestimation of the WTP (the price parameter is the denominator in the WTP calculation, i.e. below average values of the price coefficient cause disproportionately high WTP measures compared to above average values). One way to solve this problem is to keep the price coefficient fixed; then the WTP follows the same distribution as the nominator (Rigby *et al.*, 2009; Layton D. F. & Brown G., 2000; Revelt D. & Train K., 1998).<sup>3</sup>

The preceding qualitative study suggested that consumer preferences for an organic certification logo might be influenced by consumer awareness and perceptions of the logo. After the choice experiments, the participants were therefore asked to rate each logo regarding the dimensions awareness, credibility, standards and control system on a seven-point scale. Additionally, the answer category “I don’t know” was provided. As expected, the dimensions for one logo were not independent from each other. To avoid multicollinearity, the dimensions had to be reduced into one variable for each logo. However, due to the inclusion of the nominal scaled answer category “I don’t know”, methods of data analysis requiring metric data (like factor analysis) were not applicable to the original data. Therefore, the ratings were transformed into dummy variables which equalled ‘one’ in case of a high rating (the two second highest scores) and ‘zero’ otherwise. For each logo and participant, an index was then created which equalled the sum of the four dummy variables. The index could thus take on the values zero, one, two, three and four points respectively. Finally, RPL models based on the following utility function including the ‘awareness and perception index’ (*APindex*) were estimated (the procedure was adapted from Louviere *et al.* (2000, p. 295f.):

$$U_i = V_i + \varepsilon_i = ASC_i + \beta_{PRICE} PRICE + \beta_{APindex} APindex + \varepsilon_i$$

### **3.3 Sampling and description of the sample**

Data was collected face-to-face in the Czech Republic (CZ), Denmark (DK), Germany (DE), Italy (IT), Switzerland (CH) and United Kingdom (UK) in February and March 2010 after a pre-test with 15 participants per country one month earlier. In each country, around 400 consumers of organic food took part in the study. The choice experiments and interviews were conducted at specialised organic food shops and conventional supermarkets with an organic food range. The participants were recruited based on quota sampling for age and gender with a structured screening questionnaire.<sup>4</sup> Furthermore, two screening questions were used: First, participants had to be responsible for the food purchase in their household; second, they had to buy organic apples *and* eggs at least once a month (based on self-assessment).

In all countries, the age and gender quotas were fulfilled with a deviation of less than three percentage points (Table 2). The level of education was generally high in the sample, in particular in Italy. However, this result is in accordance with previous studies suggesting that the share of people with a college or university degree is, on average, higher among consumers of organic food compared to the rest of the population (Zander & Hamm, 2010; Wier *et al.*, 2008).

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<sup>3</sup> A new kind of models called ‘WTP space’ was recently developed to overcome the problem of implausible WTP distributions in RPL models. However, WTP space models are not yet available in commercial software packages.

<sup>4</sup> The country-specific quotas for the two age groups (18 to 44 and 45 to 75 years) reflected the share of these groups in the total population. Regarding gender, the quotas reflected the buying behaviour of households in each country.

**Table 2: Description of the sample: Socio-demographic characteristics**

		CH	CZ	DE	DK	IT	UK
	N	397	400	405	401	427	411
<b>Gender</b>	N	395	400	405	401	427	411
	Female	61.5%	65.8%	65.7%	71.0%	70.3%	71.0%
	Male	38.5%	34.2%	34.3%	29.0%	29.7%	29.0%
<b>Age</b>	N	397	400	405	401	427	411
	18-44 years	47.1%	61.0%	50.1%	46.6%	42.4%	51.8%
	45-75 years	52.9%	39.0%	49.9%	53.4%	57.6%	48.2%
	Mean age in years	45.1	40.3	44.1	46.3	46.2	45.6
<b>Education<sup>1</sup></b>	N	394	400	398	401	427	411
	No formal qualification	0.3%	2.8%	0.0%	3.0%	0.0%	5.6%
	GCSE <sup>2</sup>	35.8%	8.5%	25.1%	2.7%	1.6%	12.4%
	A level	29.7%	49.3%	33.2%	32.4%	11.0%	15.8%
	College or university degree	34.3%	39.5%	41.7%	61.8%	87.4%	66.2%
<b>Household size</b>	N	396	400	396	401	426	410
	Mean	2.4	2.8	2.5	2.5	2.8	2.7
<b>Household net income (per month)</b>	N	377	393	379	400	426	406
	Median <sup>3</sup>	2,700 €	1,500 €	2,700 €	3,300 €	2,100 €	3,300 €

<sup>1</sup> The listed categories are taken from the UK questionnaire. Equivalent terms were used in the other countries.

<sup>2</sup> General Certificate of Secondary Education=appr. 10 years of school.

<sup>3</sup> Class mean of the median class (ten income categories were provided in the questionnaire).

## 4 Results and discussion

All RPL models (Table 3) are statistically significant at the 99.99% confidence level (Chi square statistics).<sup>5</sup> The model fits vary across the countries with the highest model fits observed in Denmark and the lowest in Italy (based on the Log Likelihood function value). In all sets of models, the egg model has a Log Likelihood function value closer to zero compared to the apple model, suggesting the egg models have a better fit. One explanation could be that in the choice experiments, slight variations in the look of the apples could not be completely ruled out whereas the eggs looked very much alike. In all models, the price coefficient is significant and of the expected negative sign.

**Table 3: RPL models on consumer preferences for organic certification logos**

		Apple models				Egg models				
		Model 1		Model 2		Model 1		Model 2		
		RP <sup>1</sup>	$\beta^2$	SD <sup>3</sup>	$\beta^2$	SD <sup>3</sup>	RP <sup>1</sup>	$\beta^2$	SD <sup>3</sup>	$\beta^2$
<b>CZECH REPUBLIC</b>		N=782				N=776				
Price	Fix	-3.49*	–	-3.50*	–	Fix	-3.83*	–	-3.82*	–
ASC EU logo	RP	0.58 <sup>+</sup>	2.05*	0.55 <sup>+</sup>	1.93*	RP	1.11*	1.36*	1.07*	1.28*
ASC Gov'l logo	RP	2.45*	3.16*	1.72*	2.85*	RP	2.56*	2.49*	1.93*	2.09*
ASC Demeter	Fix	0.37 <sup>+</sup>	–	0.78*	–	RP	0.58*	–	0.93*	–
ASC No-buy	Fix	-7.06*	–	-6.44*	–	Fix	-7.61*	–	-7.06*	–
AP-Index <sup>4</sup>	Fix	–	–	0.54*	–	Fix	–	–	0.45*	–
Log Likelihood		-778.64		-749.76		-748.80		-724.32		
McFadden Pseudo R <sup>2</sup>		0.38		0.40		0.40		0.42		
<b>DENMARK</b>										
Price	Fix	-5.15*	–	-4.91*	–	Fix	-6.55*	–	-6.67*	–
ASC EU logo	RP	0.88*	0.94 <sup>+</sup>	0.55 <sup>+</sup>	1.12*	Fix	1.64*	–	1.35*	–
ASC Gov'l logo	RP	3.35*	2.34*	1.88*	1.79*	RP	4.40*	2.43*	2.99*	2.32*
ASC Demeter	RP	0.88*	2.05*	0.82*	1.06*	RP	1.78*	2.13*	1.58*	1.56*
ASC No-buy	Fix	-9.05*	–	-7.88*	–	Fix	-10.43*	–	-9.78*	–
AP-Index <sup>4</sup>	Fix	–	–	0.67*	–	Fix	–	–	0.69*	–
Log Likelihood		-684.68		-633.79		-614.27		-567.33		
McFadden Pseudo R <sup>2</sup>		0.46		0.50		0.52		0.57		

<sup>5</sup> The following 'no-buy cases' were excluded from the choice analysis: Participants who stated to not have chosen a product because they disliked the look, shape, colour, size, variety or smell of all offered products, or they stated to only buy from a certain shop/vendor.



		Apple models					Egg models				
		Model 1		Model 2		Model 1		Model 2			
	RP <sup>1</sup>	$\beta^2$	SD <sup>3</sup>	$\beta^2$	SD <sup>3</sup>	RP <sup>1</sup>	$\beta^2$	SD <sup>3</sup>	$\beta^2$	SD <sup>3</sup>	
<b>GERMANY</b>		N=772					N=770				
Price	Fix	-2.66*	–	-2.59*	–	Fix	-1.81*	–	-1.77*	–	
ASC EU logo	Fix	0.03	–	-0.02	–	Fix	0.48 <sup>+</sup>	–	0.41 <sup>+</sup>	–	
ASC Gov'l logo	RP	1.69*	1.03*	0.54*	0.94*	RP	2.08*	1.03*	0.82*	0.98*	
ASC Demeter	RP	1.61*	1.90*	0.34 <sup>+</sup>	1.04*	RP	2.38*	1.33*	0.91*	0.46	
ASC No-buy	Fix	-34.56	–	-34.43	–	Fix	-33.37	–	-33.53	–	
AP-Index <sup>4</sup>	Fix	–	–	0.53*	–	Fix	–	–	0.58*	–	
Log Likelihood		-805.06		-753.11			-776.52		-695.80		
McFadden Pseudo R <sup>2</sup>		0.35		0.39			0.37		0.44		
<b>ITALY</b>		N=854					N=844				
Price	Fix	-1.84*	–	-1.77*	–	Fix	-2.19*	–	-2.01*	–	
ASC EU logo	RP	1.84*	1.83*	0.74*	1.41*	RP	2.31*	2.50*	1.11*	1.87*	
ASC CCPB	RP	1.10*	1.20*	0.66*	1.01*	RP	1.52*	1.81*	0.97*	1.84*	
ASC Demeter	RP	0.95*	2.36*	0.94*	1.06*	RP	1.03*	2.31*	0.92*	1.11*	
ASC No-buy	Fix	-5.44*	–	-4.74*	–	Fix	-5.37*	–	-4.48*	–	
AP-Index <sup>4</sup>	Fix	–	–	0.70*	–	Fix	–	–	0.74*	–	
Log Likelihood		-987.59		-890.95			-933.92		-855.00		
McFadden Pseudo R <sup>2</sup>		0.28		0.35			0.31		0.37		
<b>SWITZERLAND</b>		N=772					N=778				
Price	Fix	-2.79*	–	-2.72*	–	Fix	-2.76*	–	-2.69*	–	
ASC Faked logo	Fix	0.62*	–	0.20	–	RP	0.79*	0.90 <sup>+</sup>	0.45 <sup>+</sup>	0.62	
ASC Bio Suisse	RP	1.90*	1.84*	0.22	1.79*	RP	2.64*	1.36*	0.80*	1.37*	
ASC Demeter	RP	1.16*	2.07*	0.11	0.98*	RP	1.07*	2.49*	-0.03	2.20*	
ASC No-buy	Fix	-7.12*	–	-6.78*	–	Fix	-33.60	–	-34.00	–	
AP-Index <sup>4</sup>	Fix	–	–	0.62*	–	Fix	–	–	0.69*	–	
Log Likelihood		-835.91		-764.18			-777.08		-715.13		
McFadden Pseudo R <sup>2</sup>		0.33		0.38			0.38		0.43		
<b>UNITED KINGDOM</b>		N=790					N=786				
Price	Fix	-2.30*	–	-2.27*	–	Fix	-3.47*	–	-3.41*	–	
ASC EU logo	Fix	0.23 <sup>+</sup>	–	0.39*	–	Fix	0.23	–	0.49*	–	
ASC Soil Ass.	RP	0.75*	1.57*	0.39 <sup>+</sup>	1.33*	RP	1.18*	2.12*	0.59*	1.73*	
ASC OF&G	RP	0.95*	1.13*	0.71*	1.14*	RP	1.55*	1.88*	1.16*	1.80*	
ASC No-buy	Fix	-7.70*	–	-7.38*	–	Fix	-7.11*	–	-6.55*	–	
AP-Index <sup>4</sup>	Fix	–	–	0.24*	–	Fix	–	–	0.40*	–	
Log Likelihood		-939.50		-927.04			-856.91		-834.76		
McFadden Pseudo R <sup>2</sup>		0.26		0.27			0.32		0.34		

<sup>1</sup> RP= Random parameter, Fix = Non-random (fixed) parameter.

<sup>2</sup>  $\beta$  = Parameter coefficient.

<sup>3</sup> SD = Standard deviation of parameter distribution of random parameters.

<sup>4</sup> AP-Index = Index measuring consumer awareness and perception of organic certification logos.

\* Statistical significance at the 0.01 level.

<sup>+</sup> Statistical significance at the 0.1 level.

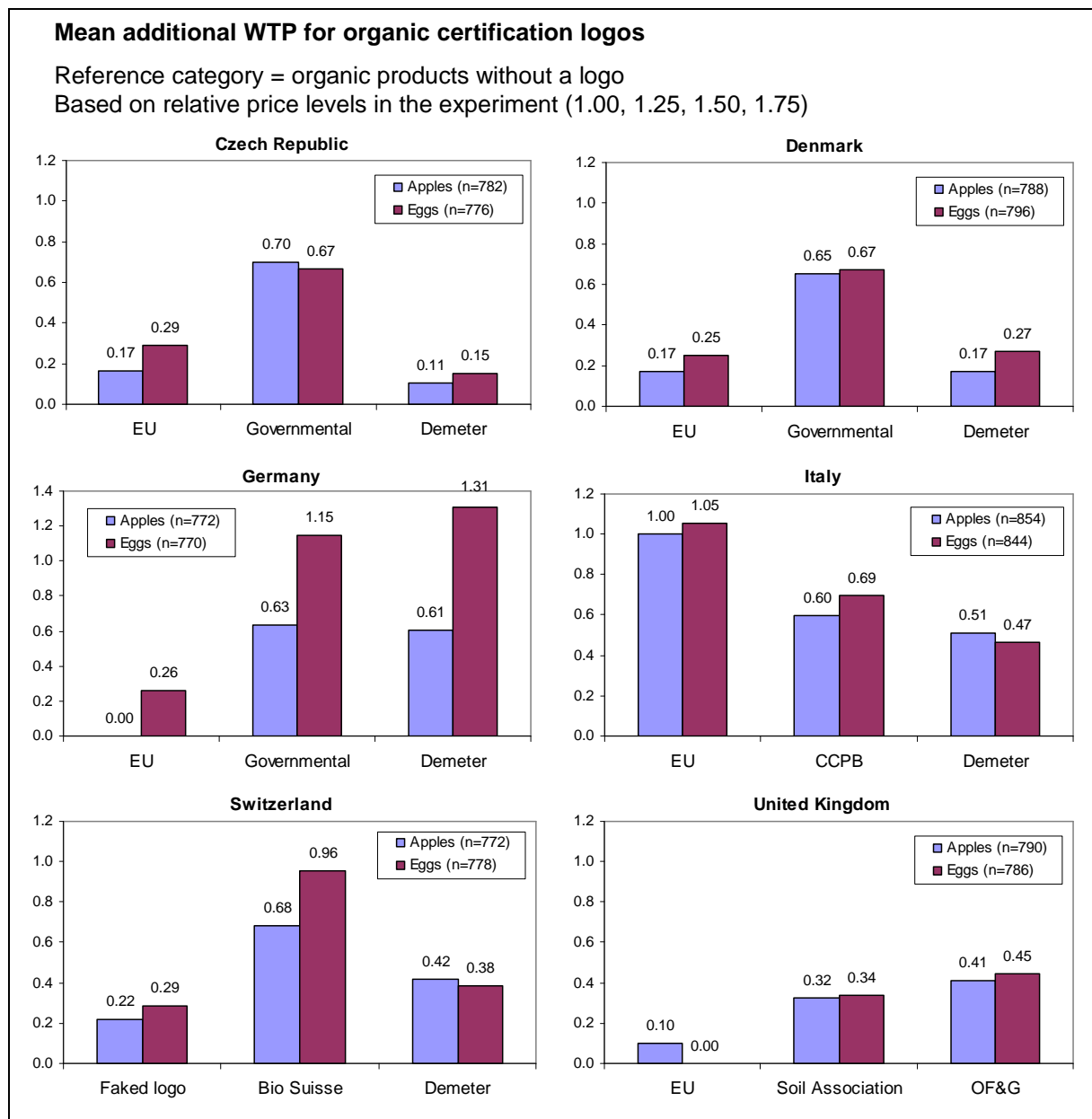
– Term was not estimated in the model.

A significant positive additional WTP compared to products without a logo was observed for almost all logos, even for the faked logo tested in Switzerland (Figure 1).<sup>6</sup> That means consumers clearly preferred products labelled with organic logos compared to similar products without a logo. However, the price premium that consumers were willing to pay differed considerably between the logos. In Switzerland, the Czech Republic, Denmark and Italy there was *one* logo with a considerably higher additional WTP compared to the other logos. Those were the Bio Suisse logo in Switzerland, the Czech and Danish governmental logos and the EU logo in Italy. In Germany and the UK, there were *two* logos with a relatively high additional WTP, namely the logo of the farmers' association Demeter and the governmental logo in Germany and the logos of the certification body 'Organic Farmers & Growers (OF&G)' and the farmers' association Soil Association and in the UK.

A comparison of the WTP for the different kinds of logos across the countries revealed the following picture:

<sup>6</sup> In this paper, the terms 'additional WTP' and 'price premium' refer to the mean additional WTP compared to similar products without a logo.

- Old EU logo: The additional WTP for the old EU logo was relatively low or equal to zero in the Czech Republic, Germany, Denmark and the UK. In contrast, the old EU logo had the highest additional WTP of all logos tested in Italy.
- Governmental logos: In the Czech Republic and Denmark, the governmental logo featured the highest WTP of all tested logos. In Germany, the WTP for the governmental logo and the Demeter logo were both equally high for apples; for eggs the WTP for the governmental logo was slightly lower than for the Demeter logo.
- Logos of private organisations: In Switzerland and the UK, the highest WTP was observed for a private logo. However, both countries do not have a governmental logo and the old EU logo was not commonly used. The Demeter logo featured a high WTP only in Germany, whereas in the Czech Republic, Denmark, Italy and Switzerland, the WTP for the Demeter logo was considerably lower than for the logo with the highest WTP.



**Figure 1: Willingness-to-pay for organic certification logos**

The RPL model estimates with the logo awareness and perception index (Table 3, Model 2) show that the coefficient has a significant positive sign in all models. Thus, a higher rating of

an organic logo in terms of awareness, credibility, standards and control system increased the probability that this logo was chosen. The logos with the highest WTP were the ones which consumers on average knew well and perceived to be credible with high standards and a strict control system. This explains why the WTP differed between the tested organic logos.

## 5 Conclusions

According to our results, very few consumers perceived organic products without a certification logo to be credible. For almost all tested organic certification logos, the WTP was significantly higher than for similar products without an organic logo. That even holds true for the faked logo tested in Switzerland. However, the WTP differed considerably between the logos. The highest price premiums were recorded for logos that were, on average, well-known and perceived to be credible with strict organic standards and a strict control system.

Our findings illustrate that third-party certification does not automatically overcome the dilemma of information asymmetry inherent in credence goods. Rather, consumer perceptions of the logo representing a certification scheme play the central role at the point-of-sale. For a certification scheme to be successful, consumer awareness of the corresponding logo and positive perceptions of what stands behind the logo are of crucial importance. We recommend that organisations owning a certification logo for consumer goods invest in marketing communication and public relation for increasing consumer awareness of the logo and forming consumer perceptions of the certification scheme behind it.

Communicating process-related characteristics of credence goods to consumers is certainly not easy, in particular in the food sector. Previous research showed that consumers know little about agricultural practices and food production (Sawyer *et al.*, 2009; Hoogland *et al.*, 2007). This dilemma highlights the importance of identifying those aspects of a certification scheme that are relevant to consumers and easy to understand. In the case of organic food, several studies showed that consumers are particularly interested in animal welfare (Zander & Hamm, 2010; Hughner *et al.*, 2007). Another reason for buying organic food frequently mentioned by consumers is that they desire products free of pesticide residues (Hughner *et al.*, 2007; Yiridoe *et al.*, 2005). Findings like these provide hints for successful marketing messages for shaping consumer perceptions of what stands behind an organic certification logo.

For producers, processors and retailers, it is highly recommendable to label organic products with a well-known and credible organic certification logo. According to our findings, there were great differences between countries as to which kinds of organic logos were preferred by consumers. In Denmark and the Czech Republic, consumers were willing to pay the highest price premium for the governmental logo. In Germany, a high WTP was recorded for the logo of the farmers' association Demeter and the governmental logo. In Italy, the old EU logo reached the highest WTP. In Switzerland, the logo of the farmers' umbrella organisation Bio Suisse was clearly preferred. In the UK, the WTP was the highest for the logos of the certification body 'Organic Farmers & Growers' and the Soil Association. The new EU logo was not subject of the choice experiments. At the time of writing, it remains to be seen how quickly the new EU logo will gain consumer awareness in the population. However, it is likely that it will take some time until the new logo is widely known, in particular in those countries where the former voluntary EU logo was not very common. In a transition period, it thus seems advisable to additionally label organic products with an organic logo that consumers know and trust.

## **Acknowledgments**

This publication was generated as part of the CERTCOST Project, agreement no. 207727 (<http://www.certcost.org>), with financial support from the European Community under the 7th Framework Programme. The publication reflects the views of the authors and not those of the European Community, who is not to be held liable for any use that may be made of the information contained. The authors gratefully acknowledge funding from the European Community.

## **Reference List**

- Aertsens, J., Verbeke, W., Mondelaers, K., & van Huylenbroeck, G. (2009). Personal determinants of organic food consumption: A review. *British Food Journal* 111(10):1140-1167.
- Albersmeier, F., Schulze, H., & Spiller, A. (2010). System dynamics in food quality certifications: Development of an audit integrity system. *International Journal of Food System Dynamics* 1(1):69-81.
- Commission Regulation (EU) No 271/2010 of 24 March 2010 amending Regulation (EC) No 889/2008 laying down detailed rules for the implementation of Council Regulation (EC) No 834/2007, as regards the organic production logo of the European Union. *Official Journal of the European Union*, L84 (31.03.2010), p. 19-22.
- Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labelling of organic products and repealing Regulation (EEC) No 2092/91. *Official Journal of the European Union*, L189 (20.07.2007), p. 1-122.
- Darby, M., & Karni, E. (1973). Free competition and the optimal amount of fraud. *Journal of Law and Economics* 16(1):67-88.
- Dhar, R., & Simonson, I. (2003). The effect of forced choice on choice. *Journal of Marketing Research* 40(May):146-160.
- Golan, E., Kuchler, F., & Mitchell, L. (2001). Economics of food labeling. *Journal of Consumer Policy* 24(2):117-184.
- Hensher, D. A., & Greene, W. H. (2003). The Mixed Logit model: The state of practice. *Transportation* 30:133-176.
- Hensher, D. A., Rose J. M., & Greene W. H. (2005). *Applied choice analysis: A primer*. Cambridge: Cambridge University Press.
- Hoogland, C. T., de Boer, J., & Boersema, J. J. (2007). Food and sustainability: Do consumers recognize, understand and value on-package information on production standards? *Appetite* 49(1):47-57.
- Hughner, R. S., McDonagh, P., Prothero, A., Shultz II, C. J., & Stanton, J. (2007). Who are organic food consumers? A compilation and review of why people purchase organic food. *Journal of Consumer Behaviour* 6(2-3):94-110.
- Jahn, G., Schramm, M., & Spiller, A. (2005). The reliability of certification: Quality labels as a consumer policy tool. *Journal of Consumer Policy* 28(1):53-73.
- Janssen, M., & Hamm, U. (2011). Consumer perception of different organic certification schemes in five European countries. *Organic Agriculture* 1(1):31-43.
- Lancaster, K. J. (1966). A new approach to consumer theory. *The Journal of Political Economy* 2:132-157.

- Layton D. F., & Brown G. (2000). Heterogeneous preferences regarding global climate change. *Review of Economics and Statistics* 82(4):616-624.
- Loureiro, M. L., McCluskey, J. J., & Mittelhammer, R. C. (2001). Assessing consumer preferences for organic, eco-labeled, and regular apples. *Journal of Agricultural and Resource Economics* 26(2):404-416.
- Louviere, J. J., Hensher, D. A., & Swait, J. D. (2000). *Stated choice Methods. Analysis and application*. Cambridge: Cambridge University Press.
- Lusk, J. L., & Schroeder, T. C. (2004). Are choice experiments incentive compatible? A test with quality differentiated beef steaks. *American Journal of Agricultural Economics* 86(2): 467-482.
- McCluskey, J. J. (2000). A game theoretic approach to organic foods: An analysis of asymmetric information and policy. *Agricultural and Resource Economics Review* 29(1):1-9.
- McFadden, D. (1974). Conditional logit analysis of qualitative choice behaviour. In Zarembka, P. (Ed.), *Frontiers in Econometrics* (p. 105-142), New York: Academic Press.
- Revelt D., & Train K. (1998). Mixed logit with repeated choices: Households' choices of appliance efficiency level. *Review of Economics and Statistics* 80(4):647-657.
- Rigby, D., Balcombe, K., & Burton, M. (2009). Mixed logit model performance and distributional assumptions: Preferences and GM foods. *Environmental and Resource Economics* 42(3):279-295.
- Roe, B., & Sheldon, I. (2007). Credence good labeling: The efficiency and distributional implications of several policy approaches. *American Journal of Agricultural Economics* 89(4):1020-1033.
- Sawyer, E. N., Kerr, W. A., & Hobbs, J. E. (2009). International Marketing of Organic Foods: Consumers, Standards, and Harmonization. *Journal of International Food & Agribusiness Marketing* 21:44-66.
- Scarpa, R., & Thiene, M. M. F. (2007). The Value of Collective Reputation for Environmentally-Friendly Production Methods: The Case of Val di Gresta. *Journal of Agricultural & Food Industrial Organization* 5:1-26.
- Teratanavat, R., & Hooker, N. H. (2006). Consumer valuations and preference heterogeneity for a novel functional food. *Journal of Food Science* 71(7):533-541.
- Thurstone, L. L. (1927). Psychophysical analysis. *The American Journal of Psychology* 100: 587-609.
- Wier, M., O'Doherty Jensen, K., Andersen, L. M., & Millock, K. (2008). The character of demand in mature organic food markets: Great Britain and Denmark compared. *Food Policy* 33(5):406-421.
- Yiridoe, E. K., Bonti-Ankomah, S., & Martin, R. C. (2005). Comparison of consumer perceptions and preference toward organic versus conventionally produced foods: A review and update of the literature. *Renewable Agriculture and Food Systems* 20(4):193-205.
- Zander, K., & Hamm, U. (2010). Consumer preferences for additional ethical attributes of organic food. *Food Quality and Preference* 21(5):495-503.