

Research Article

Firm's Decisions Based on Consumers' Choices in Ecocertified Food Markets

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The present paper proposes a framework for examining whether a food production enterprise, attempting to build an ecocertification strategy, connects the creation of environmental value with the creation of economic value, balancing environmental sustainability with economic sustainability. More specifically, the paper combines demand theory with a discreet choice consumers' model in an embryonic ecocertified food market, to examine whether economic value is created and to identify the determinants of this value creation. An empirical investigation of the model using consumer data indicates that a variety of factors, such as consumer's age and profession, family's income and purchasing strategy, product quality association in consumers' mind and the retailing outlet, play an important role in shaping the respondents' intention to pay for the ecofriendliness of products. The proposed framework can help enterprise management to balance the consumers' and enterprise owners' claims in cases where certification schemes or standards exist that enable enterprises to communicate social responsibility to their customers.

1. Introduction

The corporate environmental behavior evolves from a regulation-driven reactive mode to a proactive approach, since firms that adopt proactive environmental management strategies become more efficient and competitive [1]. This transition in business thinking from a reactive to a more proactive approach reveals operations, systems, processes, and actions that yield environmentally responsible products and services as outputs. Thus, enterprise management needs methods enabling it to develop innovative products and services that contribute to environmental protection and social welfare, without eroding the firm's viability. Since the existing methodologies have been criticized as reactive rather than proactive [2, 3], enterprises need new methodological tools for designing strategies and building environmentally responsible organizations efficiently.

In some cases, the proactive policies of environmentally responsible enterprises focus on adopting ecocertification/ecolabeling schemes. These schemes emerged as important market-based mechanisms aimed at internalizing

the externalities generated throughout the supply chain, by aligning private incentives with social values attached to natural resources and the environment [4, 5]. In these new ecocertified/ecolabeled products markets (embryonic markets), if consumers recognize the ecolabels and trust the information, they might be willing to pay price premiums for certified products supplied in the market (in fact, OECD [6] reports, based on a survey of over 10,000 households in 10 OECD countries, that half of the respondents recognize organic food labels and that labeling and certification are a key factor in purchasing organic food. Within an evolutionary game theoretic framework, Lozano et al. [7] show that certification is a very powerful signaling device dominating uncertified environmental practices and gradually replacing them). If ecolabeling successfully bridges the information gap for consumers, then the price premiums could compensate for the additional costs incurred by the businesses when implementing a certification program [8]. Thus, enterprises would be able to plan and implement an ecocertification strategy and create (shared) value for relevant stakeholders, especially for those who demand

environmental responsibility (customers) and who are owners or investors.

This paper develops a framework for examining whether the enterprise creates economic value when it creates environmental value by combining demand theory with a consumer choice model in an embryonic market, such as the ecocertified food products market. In addition, it identifies the determinants of economic value that provide useful information to enterprises, certification organizations, and public authorities. The present paper contributes to the literature by considering a broader group of factors influencing consumers' decisions, including such as, product ecofriendliness, the marketing environment, and consumer characteristics. Thus, it will be useful for enterprises to efficiently integrate (shared) value creation into their strategies, moving towards more sustainable thinking in which environmental/societal issues are at the core and not on the periphery.

The rest of the paper is structured as follows. Section 2 presents the literature review, while Section 3 examines the environmental responsible firm's decisions, and Section 4 attempts to connect the profit function with the consumers' choice decisions. Section 5 presents the intention-to-pay model, Section 6 presents the results of the empirical analysis, and, finally, the conclusions and propositions for future research are presented in Section 7.

2. Literature Review

A growing body of literature examines consumers' purchasing behavior concerning ecocertification and product ecolabeling in conjunction with consumers' socioeconomic characteristics. Govindasamy and Italia [9] evaluate the demographic characteristics of consumers that impact their willingness to purchase Integrated Pest Management products. Blend and van Ravenswaay [10] examine how consumers' economic and sociological characteristics affect their intentions to purchase ecolabeled apples. Magnusson and Cranfield [11] examine the effect of various consumers' characteristics on their demand for pesticide-free products in three Canadian cities. Furthermore, Brécard et al. [12] examine the determinants of the demand for ecolabeled seafood products and they find that "green" behavior in this market is highly correlated to consumer information, intrinsic motivation and socioeconomic status.

There are also studies examining the role of the consumers' attitudinal, cognitive, and informational factors on purchase decisions. Grankvist and Biel [13] examine the relationship between consumers' attitudes and their buying behavior towards ecolabeled food products, and Souza et al. [14] examine consumers' understanding of labeling and empirically investigate the association of consumers' demographic profile with their attitudes towards such labels. Mostafa [15] investigates the influence of three cognitive and attitudinal factors on gender differences in green purchase behavior, and van Amstel et al. [16] analyze five food labels and test the reliability of the information they provide.

A number of studies in the last decade examine the impact of socio-economic profiles on WTP. For example, Jensen et

al. [17] study the role of some demographic and attitudinal factors on WTP for three types of wood products. Loureiro and Lotade [18] examine WTP for organic and fair-trade coffee in conjunction with some demographic characteristics, and Krystalis et al. [19] offer insights into organic consumer profiles and their WTP.

Another branch of the literature examines the role of consumers' attitudinal, perceptual, cognitive, behavioral, and informational factors on WTP. Vlosky et al. [20] examine the relationships between intrinsic environmental motivations and WTP for environmentally certified products. They suggest that there are positive correlations between WTP and environmental consciousness and certification involvement and perceived importance of certification. Loureiro et al. [21] assess WTP for ecolabeled apples and conclude that people with strong environmental and food safety concerns are more likely to pay a premium. Botonaki et al. [22] examine consumer attitudes and behavior towards organic products and products produced under the Integrated Management System and compare the socio-economic characteristics and attitudes that impact WTP for these certification systems. Their findings suggest that consumers' level of awareness and information towards the certification systems is low. Barnard and Mitra [23] study the impact of consumers' attitudes and some demographic characteristics on WTP, indicating the significance of a third party certification, and Moon et al. [24] address the issue of WTP for food produced with techniques consistent with environmental stewardship, identifying differences in WTP between residents of two different districts of the same city based on their preferences, beliefs, and values. In a recent published study, Akaichi et al. [25], using experimental auctions, assess the determinants of consumers' WTP for organic milk in a multiunit shopping scenario. Their results suggest that health issues, high price of organic foods, taste, and lack of information on organic foods are factors that influence WTP for organic milk.

As is apparent from the literature review above, most studies examine the effect of a relatively small number of factors or specific categories of factors (demographic, attitude, socio-economic, cognitive, informative, beliefs, and values) on WTP. However, given the complexity of decision making, it is clear that WTP depends on a wider range of parameters. The present paper attempts to integrate a large number of factors affecting WTP, including consumer characteristics, product ecofriendliness, and the marketing environment, connected to an enterprise's ecofriendly decisions. Thus, a framework is proposed to identify the conditions under which a food enterprise creates economic value by creating environmental value, balancing environmental sustainability with economic sustainability.

3. Environmentally Responsible Firms' Decisions

Environmentally responsible approaches in natural resource-based industries address the problem of resource degradation through less intensive use of natural resources, safer use of harmful inputs like hazardous substances, and reduced waste dispersion. Environmentally responsible enterprises

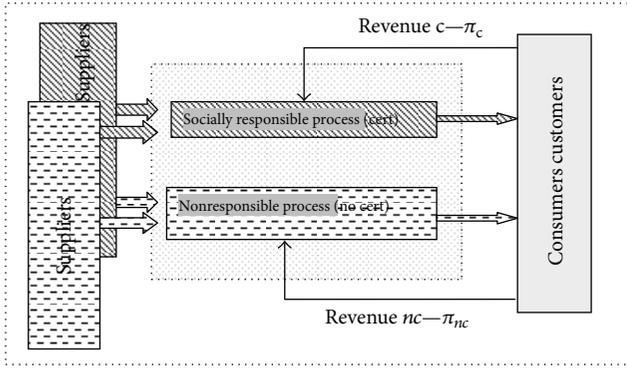


FIGURE 1: Enterprise decision framework.

can integrate new (eco)quality dimensions in their strategy by adopting an environmental management system in a process or facility and by communicating their certified efforts to customers. For example, firm in the food production sector can make a production unit/line ecofriendly and label its products properly to inform its customers. The firm's actions imply specific costs including investing in green technologies and actions, purchasing green inputs, investing in soil protection and improvement, R&D costs, training and information acquisition, implementation of an ecomanagement system, and certification fees.

In the embryonic stage of a market, little product differentiation is expected as firms focus on production process and satisfying growing demand [26]. Assume that a firm in the food sector (farm, processing facility, or marketing unit) plans to build a new ecofriendly production process that provides an ecocertified product to a certain market. Since ecocertification imply certain costs, as mentioned above, the ecofriendly firm will be at a cost disadvantage relative to conventional competition.

The firm's profit function before the ecocertification is

$$\pi = yp - c, \tag{1}$$

where y is the quantity of products, p is the price, and c is the cost before the ecocertification. After building an ecofriendly/ecocertified production process, the firm chooses its inputs to meet ecocertification requirements of a market segment, and it incurs costs $c + \Delta c$, ($\Delta c \geq 0$). We assume that it provides customers with certified products at a price $p + \Delta p$, ($\Delta p \geq 0$). We can now view two production processes in the enterprise (certified, c ; noncertified, nc) operating as strategic business units (Figure 1). If the proportion of ecocertified output offered in the market, a , is such that $1 \geq a \geq 0$, the enterprise profit increases or decreases ($\Delta\pi$) according to the sum of profits for the two processes, π_c for certified and π_{nc} for noncertified. Assuming that there are no economies of scope, we can view the profit functions of the two strategic units as follows:

$$\begin{aligned} \pi_c &= a [y(p + \Delta p) - (c + \Delta c)] \quad \text{for the certified process,} \\ \pi_{nc} &= (1 - a)(py - c) \quad \text{for the non certified process.} \end{aligned} \tag{2}$$

Combining (1) and (2), we have

$$\Delta\pi = (\pi_{nc} + \pi_c) - \pi = a(y\Delta p - \Delta c). \tag{3}$$

Equation (3) expresses the change in profit ($0 > \Delta\pi \geq 0$) expected from implementing the ecofriendly strategy assuming that consumers are willing to pay a price premium for the ecocertified product. If the right-hand side of (3) is negative then profits decrease and the ecocertification cannot create economic value. In such case, firm's management will not approve the ecofriendly/ecocertified process, unless it either expects indirect benefits, such as improved market position and brand image, or attempts to avoid penalties. If, however, this term is positive, ecocertification creates economic value, and so, there is a direct incentive for approving the ecofriendly process. Finally, if the right-hand side of (3) is zero, management is indifferent between adopting the environmentally responsible process and continues with the status quo. In this case, the management may decide to go ahead looking for long-run benefits from improved branding. Without considering potential benefits from economies of scope and spillovers, the sufficient condition for the firm's profits to increase is that the price premium for the products offered from the ecocertified process exceeds average incremental costs:

$$\Delta p \geq \frac{\Delta c}{y}. \tag{4}$$

If the above condition is satisfied, the enterprise creates economic value by creating environmental value, which means that the enterprise operates in a sustainable way.

4. Profit Function and Consumers' Choices

As defined above, we can view environmental responsibility as a form of quality incorporated into the product that is produced by two processes. Thus, the firm's product includes ecoquality (Q), taking the value 1 in the case of ecocertification and 0 in the case of no certification.

4.1. Integrating Consumer Choices into the Demand Function.

Following the above analysis, we focus on a profit maximizing enterprise competing in a specific, for example, a national, market where the consumers can choose a product of quality Q (certified and not certified). In the long run, this competitive firm chooses to create environmental value and builds an ecoprocess, deciding its output level according to the demand function $y = Y^D(p, Q, I, Cc, \Psi, N)$ [27], where y is the product quantity, p is the price paid, Q is the product ecoquality, I is the income distribution, Cc indicates demographic characteristics of the consumers, Ψ are public policy parameters affecting the distribution of knowledge, such as consumer education programs and product labeling regulation, and N is the number of consumers in the population.

The ecoquality the enterprise chooses to offer depends on investments in green technologies, actions, such as soil protection and improvement, laboratory hiring, training and

information acquisition, implementation of an ecomanagement system, and certification fees. The competitive firm chooses the ecoquality of the product to produce jointly with its output level, and it views the price as a function of quality [27]. This quality depends on capital stock. Taking the capital stock as given for simplicity, the static maximization problem is

$$\begin{aligned} \max \pi &= py - c(y, Q, w, k) \\ \text{such that } p &= P(y, Q, I, Cc, \Psi, N, w, K), \end{aligned} \quad (5)$$

where, w is the factor prices, k is the capital stock, and K is the vector of k or aggregate capital stock.

The ecoquality communicated to consumers by the eco-label can add value for customers [28, 29], determining their intent to pay a price premium (Δp) for the ecocertified product. Since we refer to a certain market, we can maintain y and N stable. If we assume that factor prices and capital stock changes are connected to the ecoinputs, these can be included in the costs and replaced by c . For simplicity, we assume that the ecofriendliness' price premium depends on factors such as the consumers' social and economic characteristics. The above expressions enable us to connect the enterprise decisions with consumers' willingness to pay a price premium, and with the determinants of this intention. The partial derivatives help to identify the expected signs.

If consumers are willing to pay a price premium this would compensate for the additional costs incurred in implementing the certification strategy and the enterprise can decide to develop the environmentally responsible process. In the case that there is no intention to pay a price premium, the enterprise management faces two alternatives: the consumers are indifferent or they are not willing to pay. In the first case, the enterprise shareholders/owners may view the environmental responsible action as an expense which may attract some customers' interest in the future, but in the second case, they may view the ecocertification as a misuse of the enterprise resources, since the additional costs to be covered by the consumers are not expected.

Moreover, if we accept Porter and Kramer's [30] proposition that enterprises creating shared value will be more effective and far more sustainable than the majority of current corporate efforts in the social arena, then the enterprise managers have to balance conflicting stakeholder claims. In particular, they should aim at achieving a balance between environmental sustainability and economic sustainability by taking into account, in addition to their own private economic net benefits, the value their actions generate for (a) society (including social welfare increase, quality of life enhancement, new knowledge, and new jobs introduction); (b) public authorities (including the lowering of the cost of environmental controls and developing new (eco) technologies); (c) managers and workers (including a healthier working environment and improvement of market position); and (d) suppliers of green inputs (including higher prices for their products and services).

4.2. The Discrete Consumers' Choice Framework. Consumer intention or willingness to pay a price premium (equal to

Δp) for the ecocertified product can be studied by the discrete choice framework, which is appropriate for analysis concerning a newly introduced ecoscheme. Discrete choice models can be used to examine how consumer purchasing behavior and preferences are influenced by the conditions under which they are realized. Such conditions concern the product attributes and characteristics that directly affect consumer choices and the environmental dimensions surrounding these choices [31, 32]. The main idea of a discrete choice model is to ask consumers to indicate their choice among various alternative purchasing options available to them.

Consider a consumer whose preference shifts from purchasing a conventional product to an ecocertified one sold at a higher price. She/he does so because the choice of the certified product increases her/his utility. In this case, her/his WTP (or intention to pay) a premium for a certified product over a non-certified one is discrete. Thus, it is evident that a utility (choice) model should be used. In this context, consumer utility, and hence, her/his intention to pay or WTP are affected by a set of factors categorized and presented in the next section. However, since some factors affecting consumer intention or WTP may be omitted from the model, a random component should be added representing the unobservable factors, such as unobservable variation in preference, random individual behavior, and measurement errors. Since the random component is unobservable, we must assume a cumulative distribution function to model the discrete choice. Several distributions can be used to capture the probabilistic nature of choice. A logistic distribution function leads to the logit model, while a standard normal distribution function leads to the probit model.

There are different variants of choice modeling corresponding to different ways of measuring consumer preferences. In the present paper, we assume that a consumer (j) will choose the alternative i if the utility she/he expects to derive (u_{ij}) is greater than the expected utility of all alternatives presented to her/him, where $j = 1, \dots, n$. As we stated above, the utility that the consumer derives from each alternative depends on the set of attributes and characteristics for this alternative. Thus, the consumer's utility can be presented as

$$u_{ij} = \alpha_{ij}\chi_{ij} + e_{ij}, \quad (6)$$

where χ_{ij} is the vector of attributes for the alternative i , α is the vector of estimated parameters, and e_{ij} is the random error component that captures unobservable consumer characteristics, missing attributes and characteristics, measurement errors, preferences heterogeneity, and so on.

5. The Intention-to-Pay Model

Combining (5) and (6), we develop a model (Figure 2) which relates the intention to pay for a certified product with a set of factors, which are grouped into seven categories: consumers' socio-economic characteristics, their family's characteristics, behavioral factors (such as consumer or family purchasing strategies), cognitive factors (such as the level of consumer

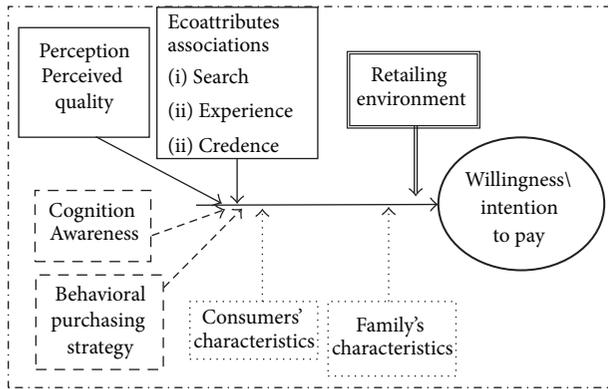


FIGURE 2: Intention to pay model.

awareness to the ecolabel), perceptual factors (such as consumer perception of product quality), associations in a customers' memory linked to the ecolabel and connected to product attributes and characteristics [28], and finally factors related to the marketing environment (such as the type of retailer).

In this model, the utility a consumer derives from purchasing an ecofriendly product is assumed to be a function of perceived quality, consumer awareness, and the three groups of ecolabel associations connected to the product attributes and characteristics or production conditions (Following Trijpp van et al. [33] and Karipidis et al. [34], we group the product attributes and characteristics into search, experience, and credence. The search attributes are observable by the consumer prior to the purchasing decision, the experience attributes become observable after purchasing the product, and credence attributes are observed long after the consumption of the product). It is also a function of individual consumer-related characteristics, such as age, education, and occupation, and family characteristics such as household income, household size (a large family implies the presence of children which could be a crucial parameter in our analysis), and purchasing strategy.

Among the members of a family, there could exist substantial differences, based on a variety of reasons such as age, education, life-event transitions, cross-cultural differences, child/parent interaction and conflict-type interactions, which influence needs, preferences, and, thus, the purchasing behavior of each individual member [35, 36]. However, when the respondent purchases a certified (food) product, it is likely that she/he takes into consideration the preferences of all family members. Thus, the needs and preferences of other family members can influence intention to pay a premium for certified products. It is impossible though to take into account other family member's characteristics directly through the survey. To capture the effect of family preferences on respondent's intention to pay indirectly, we introduce a variable representing the whole family's intention to purchase certified products. This variable is termed "purchasing strategy."

Furthermore, since the retailing environment can impact consumer choices, we choose to include some additional

explanatory variables indicating preferred retail outlets. Retailers provide additional information to consumers about product attributes and characteristics and consequently impact buying decisions [34]. Thus, we expect the retailer to affect intention to pay for ecocertified products, because it is likely that the retailer could provide consumers with information about production conditions. Because differences can exist between the retail outlets' marketing (communication) strategies and their capabilities to provide information (ecofriendly definition) to customers [37], we expect the type of retailer to be a factor affecting intention to pay.

Incorporating the above analysis into the utility function in (6), that is, splitting the vector χ_i in seven subvectors of attributes yields

$$u_{ij} = \sum_{k=1}^7 \beta_{ij}^k z_{ij}^k + e_{ij}, \quad (7)$$

where z_{ij}^k , $k = 1, \dots, 7$, are vectors corresponding to the seven groups of characteristics, β_{ij}^k , $k = 1, \dots, 7$, are the vectors of the related parameters.

6. Empirical Investigation

6.1. Model Specification and Measurements. Since we focus on newly introduced schemes in embryonic markets, the discrete event modeled in the present paper is whether consumers intent to pay a price premium (Δp) for the certified product, relative to the price of a conventionally produced product. To test the model empirically, first we examine the case of a certain certification scheme implemented in fruit and crop production. This scheme (called AGRO-2.2 in Greece) falls between Integrated Production Management and organic agriculture and meets the basic requirements of the ISO 14001 standard. It is a voluntary ecocertification/ecolabel scheme that introduces a particular set of environmentally friendly production processes that involve cautious use of hazardous substances (agrochemicals) and rational use of natural resources.

We choose to analyze the intention of consumers to pay for a particular fresh food product (peach). Since this ecoscheme has been introduced only recently (embryonic market), survey respondents had limited practical experience, and so a written definition of the scheme was provided. Survey respondents were asked to indicate which of the following three alternatives would best match their intentions: (1) "no intent to pay," if the utility they expect the ecocertified product to derive does not justify the cost they pay; (2) "perhaps or indifferent," if they are not sure that the utility which the ecocertified product provides justifies the cost they pay; or (3) "intent to pay," if the utility which they expect the ecocertified product provides justifies the cost they pay. These alternatives correspond to the three scenarios of the enterprise profits. The data were collected by developing a questionnaire which was delivered by students, to households in their home towns during the summer months of 2006, when the ecoscheme was newly introduced. After discarding

TABLE 1: The independent variables of the consumers' choice model.

Category of factors	Independent variables	Values	Type of variable	Expected sign
Consumers' characteristics	Z_1^1 Consumers' age	<40	Dichotomous	\pm
	Z_2^1 —	40–60	Dichotomous	\pm
	Z_3^1 Low education level (compulsory)	Yes = 3 No = 1	Dichotomous	–
	Z_4^1 Entrepreneur	Yes = 3 No = 1	Dichotomous	\pm
	Z_5^1 Employee	Yes = 3 No = 1	Dichotomous	\pm
	Z_6^1 Farmer	Yes = 3 No = 1	Dichotomous	+
	Z_7^1 Educator/teacher	Yes = 3 No = 1	Dichotomous	+
	Z_8^1 Housekeeper	Yes = 3 No = 1	Dichotomous	\pm
Family's characteristics	Z_1^2 Family income	<12 thousand	Dichotomous	–
	Z_2^2 —	€12–20.000	Dichotomous	\pm
	Z_3^2 —	€20–40.000	Dichotomous	\pm
	Z_4^2 —	€40–80.000	Dichotomous	+
	Z_5^2 Family size	Persons	1–11	+
Behavioral	Z_1^3 Purchasing strategy	Percentage	Continuous	+
Cognitive awareness	Z_1^4 Consumption experience	Kg/family	Continuous	+
	Z_2^4 Experience of a peach-producing county	Yes = 3 No = 1	Dichotomous	+
Perceptive perception	Z_1^5 Perceived quality	3–9	Continuous	+
Ecolabel associations	Z_1^6 Search attributes	3–12	Continuous	–
	Z_2^6 Experience attributes	4–12	Continuous	+
	Z_3^6 Credence attributes	6–18	Continuous	+
Retailing environment	Z_1^7 Greengrocer's market	Yes = 3 No = 1	Dichotomous	+
	Z_2^7 Farmers' market	Yes = 3 No = 1	Dichotomous	–

a number of problematic questionnaires, we were left with a total of 529 questionnaires to analyze.

Table 1 presents the model's explanatory variables. They are grouped into seven categories according to the theoretical analysis presented above, and the elements within each group were selected from a larger set of variables. In selecting the explanatory variables, we used previous experience as well as the results of a small-scale pretest. Table 1 presents the type and value of the variables and the expected signs for each of them determined using partial derivatives.

The level of consumer awareness is captured by two objectively measured variables: the total peach quantity purchased by the respondent's household per week (Z_1^4) as an index of his/her purchasing experience, and the respondent's experience in a peach-producing county (Z_2^4) (whether he/she had visited one or ever lived there). Perceived quality (Z_1^5) is measured as the sum of the score of three dichotomous choice questions (yes = 3/no = 1). Each group of ecolabel associations, namely, search (Z_1^6), experience (Z_2^6), and credence (Z_3^6), is measured by the mean score of a number of dichotomous choice questions (4, 4, and 6, resp.).

The model uses two variables representing the two most commonly used categories of fruit retail outlets: greengrocers and farmers' markets. These variables attempt to capture the retailer's impact on the intention to pay a premium for certified products. We expect the greengrocer (Z_1^7) to positively impact intention to pay, because she/he can transmit information regarding ecolabels and explain their significance. On the contrary, the farmer selling her product

in a farmers' market (Z_2^7) can transmit information regarding actual production conditions, thus minimizing the usefulness of the ecolabel. Therefore, we expect Z_2^7 to have a negative impact on the intention to pay a premium for certified peaches.

6.2. Model Estimation and Results. We model the observed response by considering a latent variable u_{ij}^* , ($u_{ij}^* > 0$, $u_{ij}^* = 0$, $u_{ij}^* < 0$). This variable depends linearly on the explanatory variables. Since we choose the logit model with an ordered dependent variable, the model was estimated using the ordered logit command in EVIEWS 5.1. The results of the ordered logit analysis are shown in Table 2 (coefficients, t -statistics, and P values).

The results indicate that 65,4% of respondents selected the intention to pay alternative. This percentage enables the enterprise to estimate its profit function (3) and, thus, to choose the proportion (a) of the outputs to be certified. A likelihood ratio (LR) test is used to test the null hypothesis that the estimated coefficients were jointly equal to zero. This hypothesis is rejected for the model. The null hypothesis that the estimated coefficients are equal to zero is rejected for six out of the 22 variables. This implies that there are six factors shaping the intention to pay a premium for the ecocertified product and, thus, differentiating the economic value creation in the conditions under which it is examined. The remaining variables are not found to significantly impact the dependent variable, which suggests that they are not important in explaining

TABLE 2: Results of the ordered logit estimation.

Category of factors	Independent variables	Coefficient	Std. error	<i>t</i> -statistic	Prob.
Consumers' characteristics	Z_1^1 Consumers' age	0.161475	0.100779	1.602263	0.100*
	Z_2^1 —	-0.032453	0.126482	-0.256583	0.797
	Z_3^1 Low education level	-0.072364	0.067504	-1.071999	0.283
	Z_4^1 Entrepreneur	0.067167	0.469345	0.143109	0.886
	Z_5^1 Employee	0.510620	0.431180	1.184240	0.236
	Z_6^1 Farmer	0.995558	0.585563	1.700173	0.089*
	Z_7^1 Educator/teacher	0.603099	1.055932	0.571153	0.567
	Z_8^1 Housekeeper	0.124082	0.499078	0.248623	0.803
Family's characteristics	Z_1^2 Family income	-0.431882	0.237696	-1.816956	0.069*
	Z_2^2 —	-0.306220	0.228257	-1.341557	0.179
	Z_3^2 —	0.191624	0.227386	0.842728	0.399
	Z_4^2 —	0.011135	0.013923	0.799798	0.423
	Z_5^2 Family size	0.082871	0.095615	0.866711	0.386
Behavioral	Z_1^3 Purchasing strategy	0.002096	0.000371	5.643678	0.000*
Cognitive awareness	Z_1^4 Consumption experience	0.053341	0.066169	0.806128	0.420
	Z_2^4 Experience of a peach-producing county	0.036850	0.110451	0.333627	0.738
Perceptive perception	Z_1^5 Perceived quality	0.055056	0.110508	0.498208	0.618
Eco-label associations for product characteristics	Z_1^6 Search attributes	0.010118	0.051409	0.196810	0.844
	Z_2^6 Experience attributes	0.042884	0.053525	0.801192	0.423
	Z_3^6 Credence attributes	0.083185	0.051046	1.629611	0.100*
Retailing environment	Z_1^7 Greengrocer's market	0.574712	0.237267	2.422218	0.015*
	Z_2^7 Farmers' market	-0.018296	0.240998	-0.075916	0.939
LR statistic (22 df)		82.40481	LR index (Pseudo-R2) 0.116827		
Probability (LR stat)		6.49E - 09			

* Significant at 10% level.

the "intention to pay" variable. The LR index (Pseudo-R2) in the present study is 0.1168, which is higher than that in most similar studies, implying that the explanatory capacity of the model is improved [9, 11, 38].

With respect to the respondents' and her/his family's socioeconomic characteristics, we find that three out of six characteristics, are important in explaining the intention to pay a premium. We find that younger persons and farmers have higher intention to pay a premium for ecofriendly products. Farmers are more aware of health and environmental risks related to production, and this might explain their higher intention to pay a premium for certified peaches. This result confirms Mostafa's [15] findings regarding the effect of cognitive factors on green purchasing behavior. As expected, lower household income decreases the likelihood is that the respondent would be willing to pay a premium for certified products. This result is in accordance with previous studies [9–11]. Thus, it should be asserted that when the consumers are young and are aware of health and environmental risks, economic value is created through the creation of environmental value. Contrary to this, in the case of low income consumers, economic value is not created. Thus, the low income consumers do not incur the costs of environmental improvements that can be undertaken by medium/higher income consumers for

whom there is no evidence that they are not willing to pay a premium.

A household's purchasing strategy, in particular the willingness to purchase certified peaches, has a positive effect on the consumer's intention to pay a premium for ecofriendly products. This suggests that there is a significant correlation between the respondents' intention to pay a premium for an ecocertified version of their favorite food product and their family's willingness to purchase ecocertified products. Thus, we confirm the alignment of the buyer's willingness with the family's purchasing strategy.

The results do not confirm our expectations that consumer awareness, as indicated by her/his food purchasing or consumption experience or by the respondent having lived in or visited a peach-producing county, has a positive impact on her/his intention to pay a premium. Similarly, perceived quality is not found to be of importance in explaining intention to pay a premium. This might be explained by the fact that although consumers perceive ecocertified products as being of higher quality, they do not believe that overall they are of better quality.

We next examine the importance of the three ecolabel associations (search, experience, and credence) in explaining consumer intention to pay a premium for certified peaches. As expected, search attribute associations were not

found to be important in explaining the intention to pay a premium, since these attributes are perceivable prior to purchasing, and the ecolabel does not provide important additional information. We also find that experience attribute associations are not important, although they may not be perceivable before purchasing. On the contrary, credence associations were found to positively affect the intention to pay a premium for certified peaches. This result, although anticipated, is very important given the particular attributes included in the credence group and the percentage of positive responses received. Therefore, credence associations are far more important than either search or experience associations in explaining the intention to pay a premium for certified products and in the creation of economic value. This result indicates the importance of distinguishing between the different groups of associations when conducting similar studies. It also implies that in promoting ecolabels, emphasis should be given to credence characteristics and, in particular, to those that receive the highest social and consumer interest.

Finally, the results confirm our expectation that when the respondent's main fruit outlet is a greengrocers' store, it is more likely that the respondent would be willing to pay a premium for certified peaches. This result is consistent with the suggestion of Bougherara and Combris [39] regarding the importance of information, indicating that the greengrocer can help in the creation of economic value through the creation of environmental value. However, the results do not confirm our expectation that when the respondent purchases from a farmers' market she/he is not likely to pay a premium for ecofriendly products. This might be explained by the fact that the majority of sellers in many farmers' markets are not farmers, and thus, they do not transmit information to customers related to the ecofriendly production conditions.

7. Concluding Remarks

The present paper proposes a framework that facilitates the evaluation of the economic benefits a firm could derive when it engages in environmentally friendly actions, balancing thus, environmental with economic sustainability. More specifically, the framework used in the present paper combines demand theory with a discreet choice consumer model in an embryonic market, such as the ecocertified products market, to examine whether economic value is created and to identify its drivers. The rationale for building this model is that enterprises integrate the notion of shared value into their strategies in an attempt to balance conflicting stakeholder claims, such as between those demanding environmental responsibility and the owners.

We consider a food production (farm, manufacturing, or marketing) enterprise behaving proactively, deciding to build an ecocertified process producing an ecocertified product. Viewing certified ecofriendliness as a bundle of quality attributes and characteristics incorporated into the product, we examine whether consumers intent to pay a price premium to enable the enterprise to understand the conditions under which it creates economic value by creating environmental value. Second, we examine seven categories

of factors, including socioeconomic characteristics, product characteristics, and marketing environment, and how they affect the intention to pay a premium.

The empirical investigation of a discrete consumer choice model is based on data collected by survey and reveals the impact of some factors on the intention to pay a premium for ecocertified food. The results indicate that ecocertification that creates environmental value creates also economic value and, thus, compensates, totally or partially, for the additional expenses incurred by producers and marketers. The ordered logit analysis indicates that a variety of factors play an important role in shaping the respondents' intention to pay for the ecofriendliness and drive the economic value creation, such as the consumer's age and profession, family's income and purchasing strategy, product quality association in consumers' mind and the retailing outlet.

The proposed framework can help enterprises to define conditions under which economic value can be created through creating environmental value, enabling managers to balance the main stakeholders' claims, especially those who demand social responsibility and the owners or shareholders. The owners or shareholders can benefit, since the profit remains at least equal to previous levels; in addition the enterprise can strengthen its market position and diminish potential punishments or penalties. Consumers also benefit because they can choose new, better, and safer products at the cost of development and certification, and they can live in a healthier environment. In addition to this, our analysis brings to light useful insights concerning all stakeholders, since a broad range of benefits is expected from the proactive ecofriendly behavior of enterprises. Thus, the market conditions can contribute to achieving enterprise sustainability. This framework can be implemented in several sectors, enterprise operations, and establishments and for different issues of social responsibility involving a certification scheme or a standard, such as the OHSAS 18001, SA 8000, ISO 14001, EMAS, and ISO 26000, enabling enterprises to communicate socially responsible characteristics to their customers.

The results have direct sustainability and policy implications for producers (farmers and manufacturers) and marketers as well as for certification organizations and policy decision-makers. Producers and marketers have a clear incentive to make decisions that create shared value more efficiently. They should engage in targeted communication campaigns for ecocertified products, increasing consumer awareness, a crucial driver of consumer intention to pay premiums. Furthermore, communication campaigns should target young and medium/high income customers and focus primarily on attributes and characteristics that are not perceivable prior to purchasing the product, such as those connected to risks to the environment and human health. On the other hand, certification organizations can strengthen the market position of ecolabeled products by providing credible information to consumers and encouraging producers to adopt ecocertification schemes. Given the importance of information, public authorities could consider engaging in information campaigns to increase awareness about ecolabeling among particular groups instead of only directing their resources towards subsidizing ecocertification. Public

advertisement should have a long-term perspective, targeting consumer groups with the lowest (no or indifferent) intention to pay premiums.

An important limitation of our analysis is that it assumes a linear relationship between the intention to pay and its determinants. Future research should address this issue by introducing a more complex model possibly in structural form. Furthermore, it would be useful to examine the WTP specific price premiums by offering respondents quantified alternatives, such as 5%, 10%, or 15% above the price of the conventional variety, instead of the three alternatives offered in the present questionnaire.

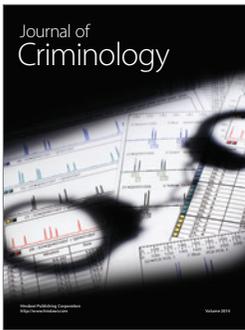
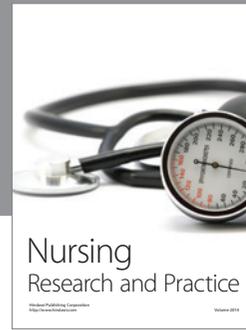
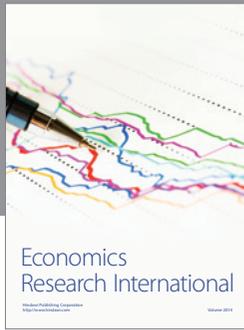
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