

Grolleau, Gilles; BenAbid, Sandoss

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Intereconomics

Suggested Citation: Grolleau, Gilles; BenAbid, Sandoss (2001) : Fair trading in markets for credence goods: An analysis applied to agri-food products, Intereconomics, ISSN 0020-5346, Springer, Heidelberg, Vol. 36, Iss. 4, pp. 208-214

This Version is available at:

<https://hdl.handle.net/10419/41108>

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Gilles Grolleau* and Sandoss BenAbid**

Fair Trading in Markets for Credence Goods

An Analysis Applied to Agri-food Products

Consumer concern about food quality issues has been increasing in Europe recently as a result of the series of food safety crises and the on-going debate on genetically engineered food products. The characteristics of a good which interest consumers in this connection cannot be directly ascertained by them, however. Credible mechanisms are required for monitoring these "credence characteristics" and signalling the results to consumers. The public authorities have an important role to play in this regard.

Many consumers prefer agri-food products to be differentiated according to origin, to be produced in an environmentally friendly and ethical process, and to be free of genetically modified organisms (GMO). Several studies have shown that consumers express a higher willingness to pay for these credence attributes. In response, many firms in the agri-food chain market products labelled with diverse credence claims.¹ By definition, consumers cannot check these credence characteristics even after purchase. For example, an extensive study of the use and control of environmental claims in the European Union has notably shown

- an increasing use of misleading and spurious green claims in both number and sophistication,
- the poor ability of public authorities to control such claims.²

Generally, the marketing of products labelled with credence claims involves public authorities – at both the national and the supranational level – that have to guarantee fair trading, notably to protect consumers from fraudulent producers.

The following paper is organised in three parts. In the first part we present an overview of economic literature proposing precise definitions and a typology of product characteristics according to consumers'

abilities to check product quality. The second part deals with mechanisms that allow market efficiency for search and experience characteristics. Lastly, we show that effectiveness in a market for products with credence characteristics not only requires solving an asymmetric information situation, but also credible mechanisms capable of defining, and not only monitoring and signalling the quality. We analyse these mechanisms and underline the essential role of public authorities to guarantee fair trading on this specific market. We provide some implications of our study in the context of the European Union.

A Typology of Product Characteristics

Traditionally, information economists categorise product characteristics in terms of search, experience and credence attributes, according to when the consumer detects the product quality.³ Later research

¹ Eileen O. van Ravenswaay: Emerging Demands on our Food and Agricultural System: Developments in Environmental Labelling, Staff Paper No. 96-88, Department of Agricultural Economics, Michigan State University, 1996.

² S. Leubuscher, W. Hager, C. Wattiez, Jennifer F. Mombrù, E. Liaska: Study on verification and control of environmental product claims, Final Report by Prospect C&S for DG Health and Consumer Protection, 1998. For a study dealing with social labels see S. Zadek, S. Lingayah, M. Forstater: Les labels sociaux: des outils au service du commerce éthique, New economic Foundation, 1998.

³ P. Nelson: Information and Consumer Behavior, in: Journal of Political Economy, Vol. 78, 1970, pp. 311-329; Michael R. Darby, E. Karni: Free Competition and the Optimal Amount of Fraud, in: Journal of Law and Economics, Vol. 16, 1973, pp. 67-88.

* Unité Mixte de Recherche INRA-ENESAD en Economie et Sociologie Rurales, Dijon, France.** University of Burgundy, Dijon, France.

Table 1
A Typology of Product Characteristics
according to Pre- and Post-purchase
Costs of Quality Detection

Characteristics	Pre-purchase costs of quality detection	Post-purchase costs of quality detection
Search or inspection characteristics	Low at each purchase	None
Experience characteristics	High at the first purchase, and low at the next purchases	Low
Credence characteristics	High	High

has clarified the original concepts.⁴ The search characteristics of a product can be accurately and efficiently evaluated prior to purchase using knowledge, inspection, reasonable effort and normal channels of information acquisition such as consumer reports. For example, apple colour is a search characteristic. The experience characteristics of a product can be accurately and efficiently evaluated only after the product has been purchased and used for a short period of time in comparison to the product's total usage life. For example, apple taste is an experience characteristic. Credence characteristics cannot be accurately and efficiently evaluated even after purchase or consumption, because the consumer lacks technical expertise. For example, an environmentally friendly production process is a credence characteristic. The consumer cannot check these characteristics even after the product has been used extensively. The cost of acquiring sufficient and accurate information is higher than its expected value and/or there is no tangible link between the expected characteristics and consumption of the product. Krouse⁵ defines this characteristic classification according to the pre-purchase costs of quality detection and the post-purchase costs of quality detection. (cf. Table 1)

For example, food quality can be evaluated by visible appearance and smell (search characteristics), taste (experience characteristic) and nutritional composition (credence characteristic). Depending on transaction conditions, a characteristic can change

types. For example mandatory labelling changes an a priori credence characteristic like nutritional composition into a search characteristic and opaque packaging changes a search characteristic like colour into an experience characteristic. Andersen and Philipsen⁶ distinguish manifest and latent characteristics. Manifest characteristics influence buying behaviour and consumers investigate them. Latent characteristics do not influence buying behaviour, but might later (re-) emerge (beef origin as a result of the epidemic of bovine spongiform encephalopathy). In this paper, we deal with manifest characteristics.

Limited Intervention by Public Authorities

We postulate that consumers validate search characteristics without any problems during their initial investigations. Market mechanisms function via a self-regulatory mechanism and outside intervention is practically unnecessary. According to the seminal work by Stigler,⁷ consumers will gather information up to the point where the cost of doing so exceeds the value of further information. In the case of search characteristics, Lancaster⁸ recognises that, "the consumer's problem of determining quality is confined to that of inspecting the goods before purchase".

Experience attributes can lead to a market failure known as an adverse selection situation. This situation arises when consumers cannot detect a permanent attribute of a product before purchase, since this information is available only to the seller. This situation can lead to the disappearance of best products from the market. In the case of agri-food products, this situation can usually be resolved by several mechanisms which require a limited governmental intervention. These mechanisms play an important role for firm reputation. Generally, they are composed so as to avoid market failure and to maintain market efficiency:⁹

□ If consumers enter the market sequentially, in-

⁴ Gary T. Ford, Darlene B. Smith, John L. Swasy: An Empirical Test of the Search, Experience and Credence Attributes Framework, in: *Advances in Consumer Research*, Vol. 15, 1988, pp. 239-248; Manfred F. Maute, William R. Forrester: The Effect of Attribute Qualities on Consumer Decision Making: a causal model of external information search, in: *Journal of Economic Psychology*, Vol. 12, 1991, pp.643-666; Esben S. Andersen, K. Philipsen: The Evolution of Credence Goods in Customer Markets: Exchanging "Pigs in Pokes", Paper presented at the DRUID Winter Seminar, Middelfart, 8-10 January, 1998.

⁵ Clement G. Krouse: *Theory of industrial economics*, Cambridge Mass. and Oxford, 1992, Blackwell.

⁶ Esben S. Andersen, K. Philipsen, op. cit.

⁷ Georges J. Stigler: The economics of information, in: *The Journal of Political Economy*, Vol. 69, 1961, pp. 213-225.

⁸ K. Lancaster: Information and product differentiation, in: K. Lancaster (eds.): *Trade, markets and welfare*, 1996, Edward Elgar, pp. 156-168.

⁹ Julie A. Caswell, Eliza M. Modjuszka: Using Informational Labelling to influence the Market for Quality in Food Products, in: *American Journal of Agricultural Economics*, Vol. 78, 1996, pp. 1248-1253.

formed consumers can share information about experience characteristics with uninformed consumers. For example, some consumers' associations test products and provide information in their reports. This is the same mechanism as when an informed consumer shares his opinion with people around him by word of mouth.¹⁰

□ Through repeated purchases, consumers have a tendency to be loyal to products they find satisfactory. Klein and Leffler¹¹ show that "cheating" on quality may not at all be profitable to firms if repeated purchases arise. If product quality is less than expected or less than implied by its price, consumers will stop purchasing these products. Consumers frequently repeat their purchase of agri-food products and they can sanction a fraudulent seller by choosing another seller for their next purchase.¹² If the probability of future interaction between seller and purchaser is very low, however, such as in the case of the purchase of a second-hand car, the reputation deterioration is not a credible threat. That is why it requires outside intervention to disclose the true quality of the car, e.g. the mandatory technical control before the purchase of a second-hand car in France.

□ Through an effective system of quality signalling from producers to consumers: use of brand names, seals of approval, labelling, warranties such as "satisfaction or your money refunded," and advertising.¹³ The effectiveness of this signalling depends on several factors, notably the possible adverse consequences for reputation and consumers' loyalty. This threat is more credible if the probability of future interaction and the potential cost in terms of adverse publicity arising from fraudulent claims are high.¹⁴

Generally, government intervention in a market for products with search or experience characteristics is limited unless some hypotheses of the previous models are not validated, as in our example of a second-hand car.

Fair Trading on Markets for Credence Goods

Several authors¹⁵ recognise that markets for products with credence characteristics require strong

government intervention to guarantee fair trading. To define fair business, we use a two-stage game between a consumer and a firm in a market for goods with credence characteristics, e.g. the environmentally friendly attributes of an agri-food product. From a consumer perspective, most of the pertinent environmental characteristics of agri-food products are linked to the environmental impacts of farming methods. Andersen and Philipsen¹⁶ call them "hidden credence characteristics" because they concern details of the production process that has little or no influence on the objective and intrinsic characteristics of the purchased good. The firm can choose between an honest strategy (producing and signalling the environmentally friendly characteristics) and an opportunist one (signalling the environmentally friendly characteristics without producing them). The consumer can believe the environmental claim and purchase an environmentally friendly product with a higher selling price. If he does not believe the environmental claim, he purchases the product like a classical product without the environmentally friendly characteristics and does not accept that he should pay a premium. The firm payoff (Pf) is the profit from the sale of the product. The consumer payoff (Pco) can be considered from two points of view according to the true well-being stemming from the purchase or the perceived well-being stemming from the belief concerning the purchase. Perceived payoffs and true payoffs are identical for the firm, which has the complete information about its own strategy. For example, let us consider that the firm behaves in an opportunist way by labelling environmentally friendly attributes without producing them. If the consumer believes the environmental claim, he purchases the product as an environmentally friendly one and has a positive perceived payoff. Therefore, the real payoff for the consumer is negative in this case, because the opportunist firm misleads the consumer. If the consumer does not believe the environmental claim, he purchases the product as a classical one and the true payoff and the perceived payoff are identical. To

¹⁰ K. Bagwell, Michael H. Riordan: High and Declining Prices Signaling Product Quality, in: *American Economic Review*, Vol. 81, 1991, pp. 224-239.

¹¹ B. Klein, Keith B. Leffler: The role of market forces in assuring contractual performance, in: *Journal of Political Economy*, Vol. 81, 1981, pp. 615-641.

¹² David M. Kreps, Robert B. Wilson: Reputation and Imperfect Information, in: *Journal of Economic Theory*, Vol. 2, 1982, pp. 253-279.

¹³ Stanford J. Grossman: The Informational Role of Warranties and Private Disclosure about Product Quality, in: *Journal of Law and Economics*, No. 24, 1981, pp. 461-483.

¹⁴ For a recent survey of the literature on quality signalling cf. A. Kirmani, Akshay R. Rao: No Pain, no Gain: a Critical Review of the Literature on Signaling Unobservable Product Quality, in: *Journal of Marketing*, Vol. 64, 2000, pp. 66-79.

¹⁵ Julie A. Caswell, Eliza M. Modjurzka, op. cit.; E. Valceschini: La dénomination d'origine comme signal de qualité crédible, in: *Revue d'Economie Régionale et Urbaine*, No. 3, 2000, pp. 489-500.

¹⁶ Ebsen S. Andersen, K. Philipsen, op. cit.

calculate the payoffs in each situation, we provide the following information:

	Production costs: C	Selling price: P	Monetary value of the well-being: WB
Classical product	$C_c = 6$	$P_c = 8$	$WB_c = 11$
Environmentally friendly product	$C_e = 10$	$P_e = 13$	$WB_e = 18$

We assume that production costs, selling price, and monetary value of the well-being of an environmentally friendly product are respectively higher than production costs, selling price and monetary value of the well-being of a classical product: $C_e > C_c$; $P_e > P_c$; $WB_e > WB_c$. We also assume that consumers prefer environmental friendly products, which means $(WB_e - P_e) > (WB_c - P_c)$. We provide general formulas to calculate payoffs: $P_f = P - C$ and $P_{co} = WB - P$. Our two-stage game is described in Figure 1.

To guarantee fair trading, perceived payoffs must become the true ones by disclosing and signalling

the true firm strategies. Case A corresponds to an adverse selection situation, which does not exist in the real world. Initially analysed by Akerlof,¹⁷ adverse selection leads honest producers not to market their high quality products. If consumers are unable to check environmentally friendly characteristics, fraudulent sellers can market bad products with a green image.¹⁸ Fraudulent producers are free riders on a market for products with credence characteristics. Consumers agree to pay a premium for environmentally friendly attributes. Fraudulent sellers want to recover this premium. But purchasers anticipate sellers' temptation to cheat and reduce their willingness to pay for environmentally friendly products. This situation can arise from the proliferation of false, spuri-

¹⁷ Georges A. Akerlof: The Market for "Lemons": Quality, Uncertainty and the Market Mechanism, in: Quarterly Journal of Economics, Vol. 84, No. 3, 1970, pp. 488-500.

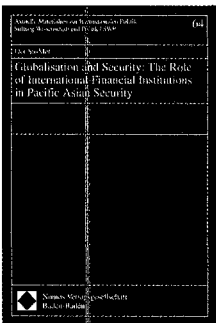
¹⁸ S. Leubuscher, W. Hager, C. Wattiez, Jennifer F. Mombrù, E. Liaska, op. cit.

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Globalisation and Security:

The Role of International Financial Institutions in Pacific Asian Security



Ooi Su-Mei

Globalisation and Security: The Role of International Financial Institutions in Pacific Asian Security

2001, 144 S., brosch., 32,- DM, 29,- sFr, ISBN 3-7890-7259-1

(Aktuelle Materialien zur Internationalen Politik, Bd. 64)

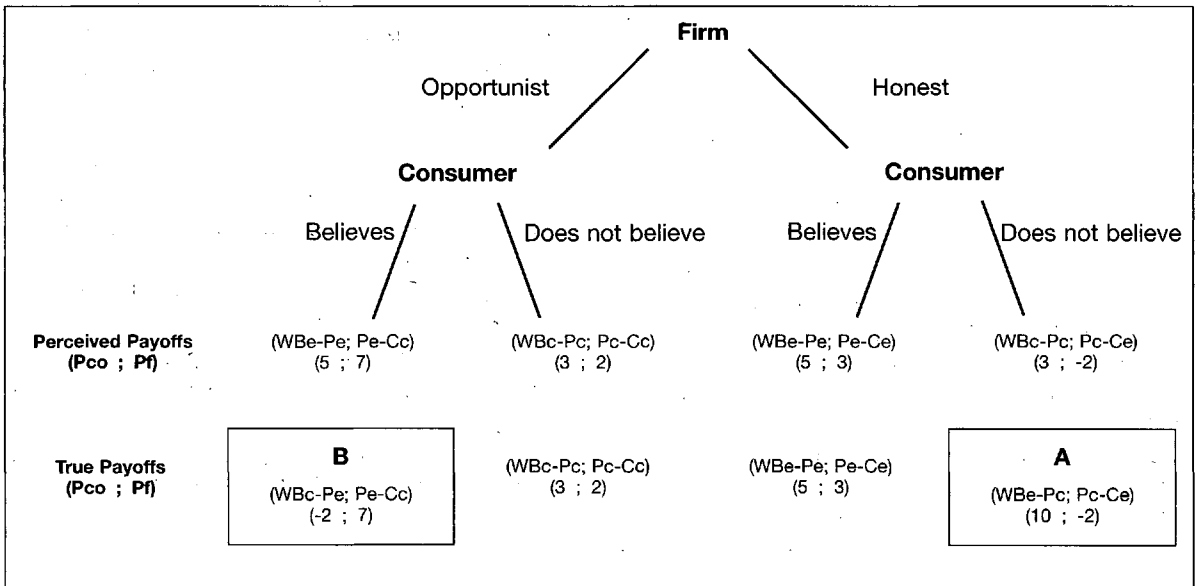
In 1997/98, an unprecedented crisis hit the economies of hitherto prospering East Asian countries such as Thailand, Indonesia, Malaysia, and South Korea. With the exception of Malaysia, the International Monetary Fund (IMF) was called in to offer support. The Fund's rescue packages included severe conditions for both macro-economic and micro-economic adjustment, some of which had far-reaching consequences for economic, legal, and even political systems and have subsequently been criticised in certain quarters for sharpening rather than containing instabilities.

This monograph looks into the impact of IMF (and World Bank) conditionality on the internal and external stability of affected countries as well as on regional cooperation and draws conclusions as to the relevance of security considerations in the context of the reform of international financial institutions.

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Figure 1
A Two-stage Game Between a Firm and a Consumer



ous, deceptive environmental claims in the market.¹⁹ Sellers of true environmentally friendly products are penalised and cannot cover their higher production costs. They reduce their willingness to market true environmentally friendly products and finally this situation leads to the elimination of true environmentally friendly products.

By disclosing the true strategies of the firm, the Nash equilibrium among the perceived payoffs, i.e.(5; 7), will be eliminated. Indeed this perceived Nash equilibrium corresponds to a penalised consumer because he believes a false claim. So, the optimal Nash equilibrium among the remaining true payoffs is (5; 3), which is also socially optimal. This equilibrium corresponds to honest behaviour by the firm, which can credibly signal its environmentally friendly products to a consumer who believes the signal. In its informational guide, the official brand "NF-Environnement" states that its purpose is to eliminate the previous situations A and B by "providing an accurate information about ecological quality of products and allowing firms to valorise their environmentally friendly efforts by labelled products".²⁰ The new European Regulation (EC 1831/2003) on the "European Eco-label" also recognises that, "The objective of the Community eco-label award scheme is to promote products which have the potential to reduce negative environmental impacts, as compared with the other products in the same product group (...). This objective shall be pursued through the

provision of guidance and accurate, non-deceptive and scientifically based information to consumers on such products."

To (re-)establish market effectiveness, outside intervention is necessary to allow consumers to choose products that correspond to their preferences and honest producer firms to credibly signal their products. Generally, this situation requires governmental intervention to guarantee fair trading. For credence attributes, consumers cannot check quality, even after purchase. The previous mechanisms, i.e. information sharing, repeated purchases and signalling are inefficient. Indeed their efficiency is reliant on consumers' abilities to detect a cheat after the purchase. In the case of credence attributes consumers cannot verify the quality itself, but only deduce the credence quality from the signal. They "believe" or "give credence" to the signal, without checking or testing the credence quality itself. To avoid a market failure, consumers need a credible third party.²¹ Indeed, in the case of credence characteristics, consumers do not have the information to detect quality (asymmetric information) and even if this information is disclosed, consumers cannot process this information because of their lack of ex-

¹⁹ Ibid.

²⁰ Afnor: NF-Environnement - Dossier d'information, Paris, 07/11/2000.

²¹ E. Valceschini, op. cit.

pertise abilities (cognitive problem).²² Third-party intervention can be considered, such as consumers' delegation of their power to define and monitor quality. The effectiveness of third-party intervention means generating consumers' trust and influencing their purchase choice. This effectiveness depends on several factors, notably:

□ the way quality is defined: for example, the claim "GMO free" supposes the previous definition of a GMO product itself,²³ the choice of a detection threshold and the level of investigation of the food into agri-food chain (e.g.: what about the milk from cows bred with GMO cereals?) Generally, public authorities can define the criteria themselves or organise this definition. Indeed, by arranging the definition of criteria, public authorities avoid situations where everybody chooses his own definition.²⁴ For example, public authorities can set up independent agencies with specific rules (participants, rules of deliberation, etc.) to manage the definition of criteria.

□ a credible monitoring previously defined such as the requirement to appeal to an independent expert, who checks product conformity with the specifications according to a procedure previously elaborated.

□ an ability to provide cognitive support to consumers capable of taking "consumers' attention".²⁵ Simon²⁶ also recognises this transition from an "economy of information" to an "economy of attention": "What information consumes is rather obvious: it consumes the attention of its recipients. Hence a wealth of information creates a poverty of attention, and a need to allocate that attention efficiently among the overabundance of information sources that might consume it." Indeed, consumers have less time and limited abilities to process increasing information flows. This situation requires more than solv-

ing an asymmetrical informational situation, i.e. providing accurate and credible information²⁷ but especially implementing a cognitive support for consumers. The European Regulation (EC 1831/2003) on the European eco-label outlines this idea: "It is necessary to provide more information on the label about the reasons for the award in order to assist consumers in understanding the significance of the award." This cognitive support can be "markers and knowledge summaries" capable of taking consumers' attention.²⁸

In other words, the effectiveness of this delegation corresponds to changing a credence characteristic into a search characteristic. Indeed, the consumer does not ask himself whether or not he grants credence. He searches the cognitive support, which summarises all the previous conditions. Some empirical studies argue that the effectiveness of this delegation depends more on the reputation and status of the third party than on a precise knowledge of the methods of its intervention.²⁹ For example, the use of the names of famous environmental associations (WWF, Greenpeace) increases the credibility of green claims, without necessarily satisfying the expectations of consumers.³⁰

In markets for products with credence characteristics, governmental intervention can be direct (by playing the third expert) or indirect (by delegating this role to other third parties) or implicated in hybrid structures (government and/or other agents). We can specify this classification according to the three stages previously defined. In theory, all combinations between third structures and stages are possible.

The examples in bold type in Table 2 could correspond to the following situation: (1) the government defines the thresholds to claim GMO free and the methods of assessment. (2) an independent laboratory checks the conformity of the product according to

²² Sigmund A. Wagner: *Understanding Green Consumer Behaviour: A qualitative Cognitive Approach*, London, 1997, Routledge.

²³ "It is useful to make a distinction between two general types of GMOs, namely:

- Process-based GMOs where biotechnology has been used to enhance productivity or yield for a good (e.g., RoundUp Ready or Bt varieties of canola, corn and soya). Because the end-use attributes have not been altered, the result may be a mixed supply of commodities that makes it impossible to differentiate biotechnology-based goods from non-biotechnology-based goods.

- Product-based GMOs where biotechnology has been used to alter the end-use attributes of a product. The product is differentiated in the marketplace as industry tries to develop a segmented, niche market. Therefore, the consumer will not have difficulty distinguishing a GMO product from a non-GMO product." Peter W. B. Phillips, G. Isaac: *GMO Labeling: Threat Or Opportunity?*, in: *AgBioForum*, Vol. 1, No. 1, 1998, pp. 25-30.

²⁴ A. Nadai: *Concurrence dans la qualification environnementale des produits*, in: *Revue d'économie industrielle*. No. 83, 1998, pp. 197-212; Julie A. Caswell: *Labeling Policy for GMOs: To Each his Own?*, in: *AgBioForum*, Vol. 3, No. 1, 2000, pp. 305-309.

²⁵ Michael K. Goldhaber: *The Attention Economy and the Net*, 2nd Draft version of a talk presented at the conference on "Economics of Digital Information", Cambridge, MA, <http://www.well.com/user/mgoldh>, Jan. 23-26, 1997.

²⁶ H. Simon, in: *Scientific American*, September 1995, p. 201.

²⁷ S. Zadek, S. Lingayah, M. Forstater, op. cit.

²⁸ E. Valceschini, op. cit.

²⁹ S. Zadek, S. Lingayah, M. Forstater, op. cit.

³⁰ S. Leubuscher, W. Hager, C. Wattiez, Jennifer F. Mombrù, E. Liaska, op. cit.

Table 2
Combinations of Structures and Stages to
Guarantee Fair Trading in a Market for
Credence Goods

Delegation	Public authorities	Private third parties	Hybrid structures
(1) Defining	X	X	X
(2) Monitoring	X	X	X
(3) Signaling	X	X	X

the legal methods of assessment. (3) the previous stages allow the use of a specific seal of approval like "GMO free – Checked by Independent Laboratory", which frequently associate a third party with brand name and firm reputation. Reputation mechanisms can work because of the involvement of these credible third parties, such as governments, environmental activists and consumers' associations, which have expertise abilities and can punish fraudulent firms by using denunciation, boycott, and legal proceedings.³¹ For example, Greenpeace discloses periodically true choices of some food processors concerning the presence or absence of GMO. Governmental intervention is not only direct intervention on markets (by mandatory labelling or minimum standards, for example), but also takes place in other ways like support to environmental activists, which can disclose the true strategies of firms.³² Public authorities can also delegate their power to a third party capable of coordinating consumers and producers on a market based on credence goods. The European regulation (EC 1980/2000) on the "European Eco-label" states, "For the acceptance by the general public of the Community eco-label award system it is essential that environmental NGOs (Non-Governmental Organisations) and consumer organisations play an important role and are actively involved in the development and setting of criteria for Community eco-labels."

Conclusive Remarks

The intervention of public authorities is necessary to guarantee fair trading on a market for products with credence characteristics. In the best case, intervention by third parties such as governments can

transform a credence characteristic into a search one. There are several methods of intervention by public authorities in order to guarantee fair trading on markets for credence goods (supporting consumers' associations and environmental activists, mandatory or voluntary labelling, monitoring advertising etc.) To determine the optimal mix of these strategies, further research on their cost-effectiveness seems necessary. According to the market size of the considered product, coordination between several public authorities – national and supranational, for example – could be a promising field of research. For example, this question concerns the European harmonisation of the different national definitions, monitoring and signalling of organic products both to protect consumers and to avoid competitive distortions between countries. Moreover, several organic products are imported from non-European countries. In a fair trading perspective, European consumers and producers want to be sure that these products meet requirements equivalent to those defined by the European Union.

Another extension of our analysis concerns the regulation of controversial characteristics markets.³³ There is no classical situation of informational asymmetry here, as with search, experience or credence characteristics. This new kind of characteristic comes from a controversy and uncertainty framework. The situation is characterised by a lack of scientific knowledge which is shared by all agents, and which is not established and stabilised. There are important controversies and debates, e.g. GMO consequences for health. In the case of credence characteristics, consumers cannot evaluate the quality at any stage of the product life-cycle. But some agents (producers, experts etc.) own this credence information and can use it to cheat. With controversial characteristics, all agents are conscious of a potential risk, but this risk is unknown and no-one can currently probabilise it. This new concept justifies the use of the "precautionary principle" and opens a large field of investigation, notably to understand how public authorities can guarantee consumers' safety and fair trading. In this field, the European Union and the United States have divergent perspectives. Indeed, risk management varies among countries and can lead to different regulations, which can seriously affect international trade.

³¹ Timothy J. Feddersen, Tom W. Gilligan, Saints and Markets: Activists and the Supply of Credence Goods, Working Paper, University of Southern California, 2000; Jamie A. Grodsky: Certified green: the law and future of environmental labeling, in: The Yale Journal on Regulation, Vol. 10, No. 147, 1993, pp. 147-227.

³² Timothy J. Feddersen, Tom W. Gilligan, op. cit.

³³ S. Lupton: L'incertitude sur la sécurité environnementale et sanitaire d'un bien: la nécessité d'une catégorisation nouvelle de biens?, 3èmes journées GREEN-CIRANO, Ste Foy, Québec, Dec. 3-4, 1999.