



ECONOMIC CONCEPTS OF ORGANIC CERTIFICATION

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This report presents an application of economic theory to the case of organic food products and the certification system.

Based on a synopsis of the existing literature, a theoretical framework of organic certification is developed with a classification of relevant transaction costs, which are specifically linked to the production and commerce of organic food products.

Relevant terms regarding inspection and certification (Part A) and economic concepts (Part B) are compiled in the Glossary, to be found in the Annex of this report.

DISCLAIMER

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organicagriculturalsciences U N I K A S S E L



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Abbreviations

Art.	Article
CAC	Codex Alimentarius Commission
CAC/GL	Codex Alimentarius Commission Guidelines
CB	Control body
EEC	European Economic Community
EC	European Community
EN	European Norm
FAO	Food and Agricultural Organisation of the United Nations
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (German Technical Cooperation)
IFOAM	International Federation of Organic Agriculture Movements
ISO	International Organization for Standardization
ITF	International Task Force on Harmonisation and Equivalence in Organic Agriculture
NOP	National Organic Program
SCM	Standard Cost Model
USDA	United States Department of Agriculture

INTRODUCTION

Certification is a key element in marketing organic food products. Based on economic theory, this report wants to illustrate the economic reasoning for certification. The intention is to provide a description of economic concepts, which is understandable for a wider audience. We are focusing on the basic economic literature.

Chapter 1 “*Organic certification system*” describes the current control system in the European Union. Why this is necessary, will then be explained based on a synopsis of economic literature. Of specific significance for organic certification and the CERTCOST project are the concepts of institutional economics and economics of crime. The relevant points of economic theory will be presented and discussed in chapter 2 “*Theoretical framework*”. Finally, the costs and benefits of organic certification will be illustrated in chapter 3 “*Costs and benefits of organic certification*”.

The authors gratefully acknowledge the fruitful discussion with and the contributions from the CERTCOST project partners, especially those from Michal Lostak and Lukas Zagata from the Czech University of Life Sciences (CULS), during the elaboration of this report.

1 ORGANIC CERTIFICATION SYSTEM

The organic **certification**¹ system in place in the European Union was established in the 1990s. The idea of organic agriculture however is much older, dating back to the 1920s. In this chapter the development of organic farming and the resulting formation of today's certification system shall be described.

1.1 History of organic farming and organic certification

Today, organic food and farming in the European Union is regulated by Council Regulation (EC) No 834/2007. One common starting point of the different organic movements, which evolved in the beginning of the last century, was the objective to develop a farming system relying on the farm-own resources as far as possible ("*concept of the farm as an organism*") (Lampkin et al. 1999; Dabbert et al. 2004).

Concepts on how to farm, were published in articles firstly and people discussed and developed these concepts in the different movements and groups. There was no necessity to define precise production rules as long as the consumers bought organic products directly on farms. With growing markets, the relationship between farmers and consumers became more impersonal. The need for more formalised systems became apparent in order to, both, protect consumers from fraud and to protect producers from unfair competition (Schmid 2007).

Over the years, the different concepts of the organic movements became more formal and developed into guidelines (Vogt 2001). The **compliance** with such guidelines initially was inspected informally (Rundgren 2002), e.g. by farmers from the association.

By-and-by, this system emerged into a more and more formal system of **standards**: written rules which are controlled via onsite-inspections by an

¹ *Bold terms are explained in the glossary, to be found in the Annex to this report.*

independent body, the **control body**. Sanctions could be imposed on producers not fulfilling certain standard requirements (Rundgren 2002).

Setting up formal rules was a necessary prerequisite for the enlarging organic food market. Over the years, the initial concepts thus changed into binding standards which became more and more detailed and comprehensive (Vogt 2001). The first national **private standard** of organic farming was established in Great Britain in 1973 and the first national **regulation** (public standard) in the European Union was adopted in 1983 in Austria (Lampkin et al. 1999).

The **inspection** or control system which controls the compliance with the standards developed in parallel with the standards. Specialised control bodies² emerged during the 1980s. Certification is the procedure by which a independent body, the certification body as third party next to producer and consumer, gives – based on a **control** – assurance by a **certificate** that a product or process is in conformity with certain standards (Codex Alimentarius Commission 1995; Rundgren 2007), see Figure 1.

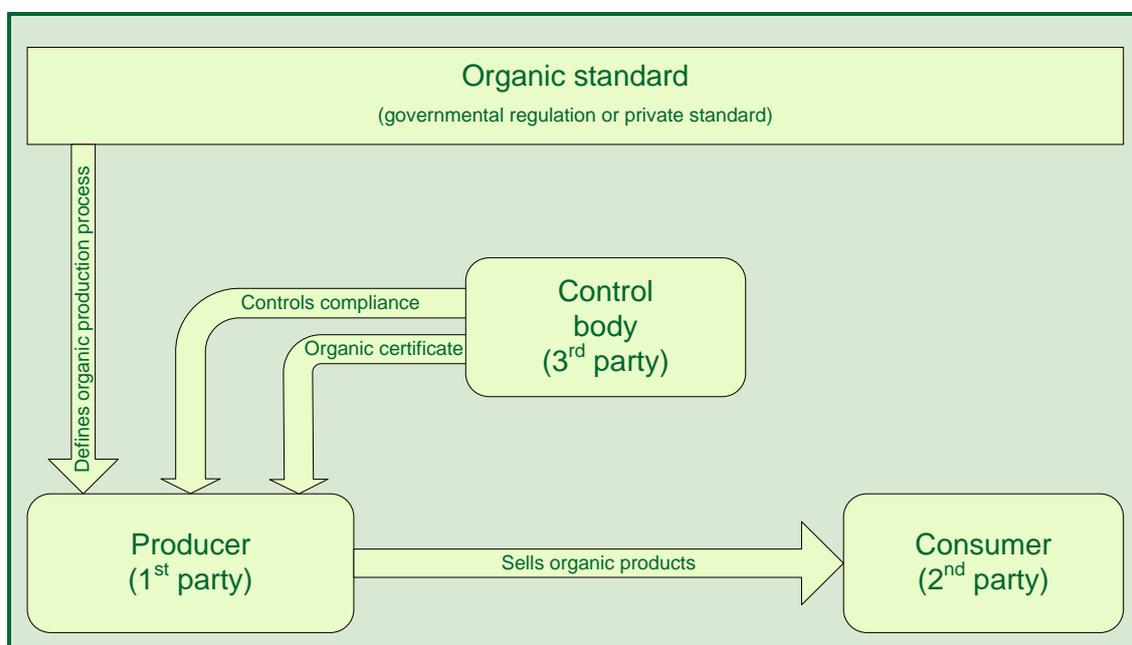


Figure 1: Simple structure of certification

1.2 Development of the European regulation on organic food and farming

Increasing interest in organic agriculture and food by consumers during the 1980s faced non-transparent organic markets and high fraudulent potential (Dabbert et al. 2004). *Council Regulation (EEC) 2092/91 on organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs*

² Regarding the use of the term “control body” and its differentiation from the terms certification body and inspection body, see also “Control body” in the Glossary.

was adopted in 1991 in order to ensure fair competition between producers and products and in order to ensure transparency of organic production methods and hereby increase consumers' credibility in organic food (EC 1991).³

This regulation for the first time defined what could be sold as organic food on the globally important European market. It was and the subsequent Council Regulation (EC) No 834/2007 currently is the minimum European standard, defining the processes by which organic food has to be produced.

1.3 Organic certification in the European Union

By regulation 2092/91 the Member States were obliged to set up a control system in order to assure the organic **quality**. Three different control systems are in place in the different Member States (see Figure 2):

- A System of approved private control bodies
- B System of a designated public **control authority**(ies)
- C System of a designated public control authority and approved private control bodies (European Union 2009)

The basic structure of the different control systems in the Member States is the same. Any organic **operator** must notify her/his activity to the **competent authority** of the Member State where the activity is carried out (EC 2007, Art. 28, 1(a)).⁴ All operators who produce, prepare, store and import organic foods are controlled for compliance with the organic standard (since January 2009 this is based on Council Regulation (EC) No 834/2007). In case of compliance, the control body or control authority issues a certificate (**documentary evidence**) to the operator. This certificate assures the adherence to the underlying organic standard and has the function of a quality signal.

³ *The increasing importance of environmental concerns regarding the agricultural production led to the implementation of national support programmes for organic farming and to its integration into the Common Agricultural Policy reform in 1992 (Dabbert et al. 2004).*

⁴ *The notification of an operator's organic production activity to the competent authority is usually done by the control body of an operator.*

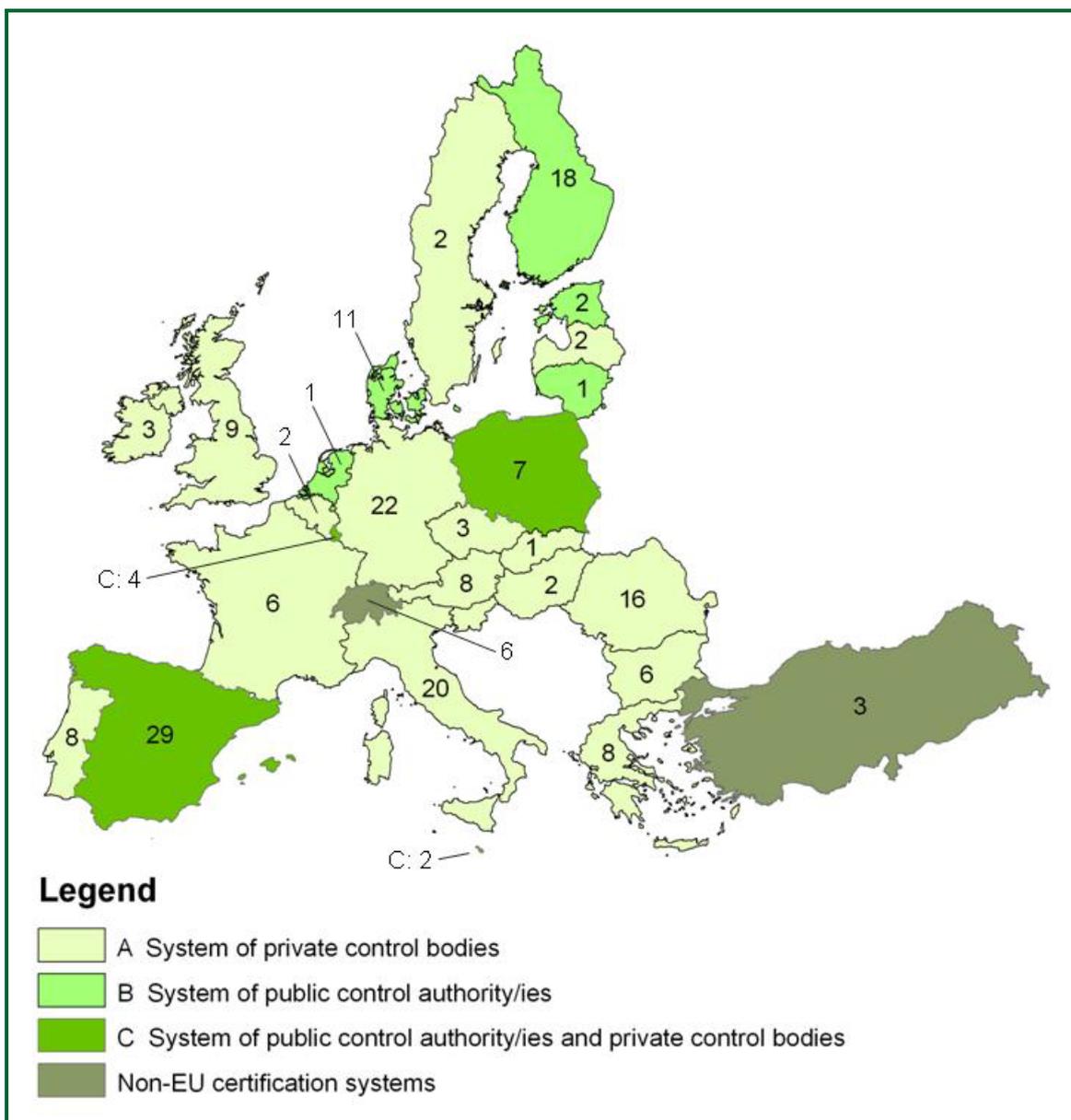


Figure 2: Certification systems in the European Union and the CERTCOST project countries with the number of control bodies and/or authorities active in the country (Rundgren 2008; European Union 2009)

Control bodies have to demonstrate that their certification processes are in line with the general requirements for product certification systems as laid down in **European Standard EN 45011** respectively **ISO Guide 65**. This is done by **accreditation**, a procedure by which an authoritative body (either a public or a private accreditation body) gives a formal recognition that the control body is competent to provide inspection and certification services (International Task Force (ITF) 2007). Furthermore, the control body must be approved by a designated authority (**approval**) and is supervised by the competent authority of a Member State (EC 2007, Art. 27 states specific requirements).

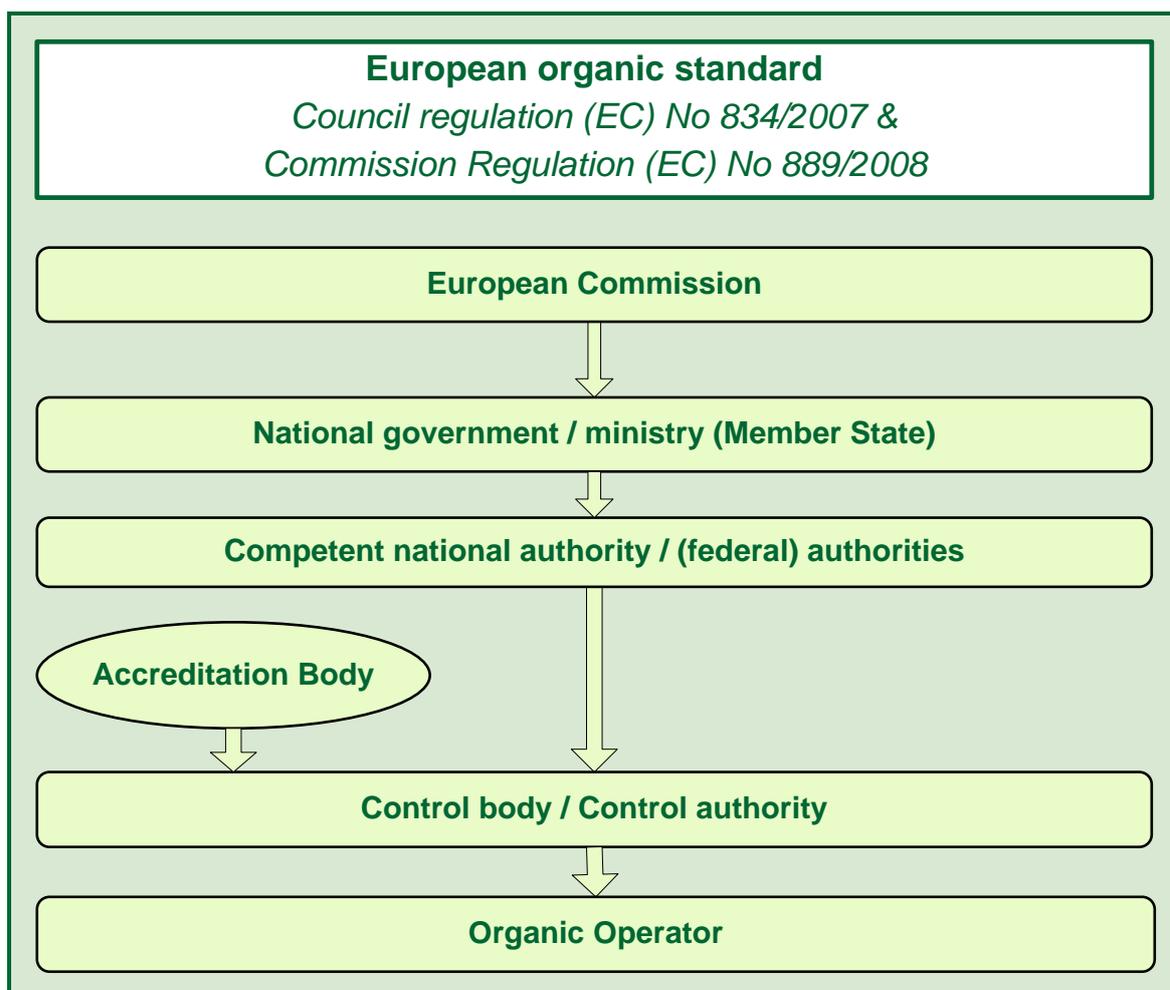


Figure 3: Institutions involved in organic certification against the European organic standard

This organic control system is supervised on two levels: on the national level by the Member States and on the European level by the European Commission. The supervising authorities in the Member States ("*competent authorities*") shall ensure objective and independent controls and verify the effectiveness of controls (EC 2007, Art. 27, 9), see Figure 3.⁵ The Member States report information on the control system and its supervision to the European Commission on a yearly basis.

Certification against Council Regulation (EC) No 834/2007 is compulsory. Furthermore, every organic operator can voluntarily decide on being certified for one or more private standards, e.g. standards from farmers' associations, umbrella organisations or certification bodies. Since every organic food product which is sold in the EU, has to comply with the European organic standard, private standards can only be equivalent or stricter than Council Regulation (EC) No

⁵ There can be different competent authorities responsible for the supervision of the organic control system in Member States with a federal structure.

834/2007. In some countries, private standards reach considerable market shares.⁶

The adherence to a private standard is usually controlled by an independent private control body, which checks the compliance with the standard (cf. Figure 1: Simple structure of certification). Additional controls result in additional costs for the certification against private standards. Sometimes, these additional certifications are criticised as double or triple certification, leading to additional costs only. But the decision for or against this certification is voluntary and relies on the individual cost-benefit considerations of an operator. Nonetheless, if a private standard represents a de-facto minimum quality standard (e.g. due to high market coverage), the standard owner might be tempted to misuse this strong market position.

⁶ Further information on private organic standards will be gathered and published on the homepage <http://organicrules.org/> in the course of the CERTCOST project.

2 THEORETICAL FRAMEWORK

Organic food exhibits specific quality attributes which require specific assurance instruments, i.e. certification, on these attributes. Firstly, the characteristics of organic food quality will be illustrated in this chapter before the institutional economics concepts of information and **transaction costs** will be discussed. Finally, the concept of economics of crime, which is of relevance regarding the enforcement of a standard, will be introduced.

2.1 Organic food quality

The European Commission considers the information of consumers on the “*product characteristics and farming attributes*” as an “*essential goal of agricultural policy*” (Commission of the European Communities 2009). This statement distinguishes between product characteristics or product quality on the one hand and the process of producing food or the process quality on the other hand. These two dimensions of quality are important, especially for organic food products.

Regarding food, the product quality is mainly given by nutritional and sensory (look, smell, taste) attributes which can usually be tested on the product. The organic quality of food mainly results from the production process: the “*way in which it was produced and the procedures involved in **processing***” (Schröder 2003). Therefore, organic quality is called a process quality. This specific quality cannot be reliably tested on the product itself (Caswell et al. 1998; Northen 2000) and results in potential quality uncertainty for consumers.

The information needs of organic food consumers regarding the process quality can be met by the implemented control system via **labelling (control label)** (Commission of the European Communities 2009). The certification provides assurance concerning the organic quality to buyers of organic food products.

2.2 Institutional economics

Institutional economics directly entitle the fundamental matter of their analysis: **institutions**. The definition and understanding of this term however is challenging, because it includes many different notions. In general, institutions have a regulative respectively guiding character for social interaction either of formal (e.g. a law, a contract or a standard) or informal kind (e.g. customs or unwritten rules of any group). The following examples of institutions illustrate the multitude and diversity, from the public to the private area: the state, economic freedom, a contract, the matrimony and the rules of a game (North 1990; Göbel 2002).

We understand an institution as a system of norms comprising instruments of enforcement targeting to particular goals. This system intends to govern individual behaviour (Richter and Furubotn 2003).

It is evident that a rule is ineffective if it is not accompanied by procedures for detecting deviations from the rule and an associated sanction system. Hence, a governance system combines formal and informal rules with instruments for enforcement of the rule. The latter can either be a soft, e.g. value-rational or ethical mechanism or a hard sanction defined by a law. Hereby, institutions structure economic operations and activities and reduce uncertainty of the actors (North 1990). In markets, the framework of rules results in easier exchange processes and finally reduces the costs that are connected to the trade of goods and services. Summarizing, institutions influence economic behaviour of individuals and hereby the whole economic process.

With regard to organic food certification, the definition (by a standard or the European Regulation 834/2007) of what organic food is can be considered as an institution. This institution is of twofold relevance: first, it helps solving the information problem of consumers regarding the organic quality, by defining what exactly can be sold as organic food. This aspect will further be illustrated in chapter 2.2.1 (Economics of information). Second, the organic standard as an institution facilitates coordination and competition along the supply chain and lowers the costs of exchanging organic goods by reducing uncertainty (Will and Guenther 2007). Using the concept of transaction cost economics, the cost relevance of standards for both, producers and consumers, will be discussed and analyzed in chapter 2.2.2 (Transaction cost economics).

2.2.1 Economics of information

In economics, the concept of *Homo Oeconomicus* is widely applied. This model of mankind in economic theory assumes rational behaviour based on complete information, i.e. perfect market transparency regarding the prices and quality of the goods traded and the conduct of market actors.

Models as simplifications of the real world normally exhibit shortcomings in representing the real world. A major critical point of the *Homo Oeconomicus*-approach is the assumption of complete information since humans only dispose of limited cognitive capacities for collecting, storing, retrieving and processing

information. Economists call this “*bounded rationality*” (Simon 2008). To collect information is costly: one has to pay for information or to collect it oneself by spending scarce time.

Regarding the collection of information on quality attributes of goods, economists differentiate three categories according to the costs of collecting this information: search qualities, experience qualities and credence qualities (Nelson 1970; Darby and Karni 1973). Search qualities can be evaluated at low cost before the purchase, e.g. the colour of a tomato. Experience qualities cannot be checked before the purchase, but easily afterwards, e.g. the taste of a tomato. Credence qualities of a good cannot reliably be assessed by the consumer, neither before nor after buying the good, e.g. the organic quality of a tomato which results from the production process (Lippert 2005)⁷. The consumer has to rely on the organic claim or labelling of an organic food product⁸, since she/he cannot verify the information about the quality. The producer on the other side possesses all relevant information on the organic quality, since only he knows how the good was produced. In this constellation, the information on the product quality is asymmetrically distributed between seller and buyer.

Lack of information and asymmetric information can result in market failure. Market failure refers to situations when markets cannot fulfil their function of allocating resources optimally. In cases when the buyer is not fully informed on the characteristics of a good (quality uncertainty), she/he will orientate her/his willingness to pay at the unknown expectable average quality. If in such a situation high quality goods cannot be produced at the price consumers are willing to pay (based on the quality they expect to get), these products would be forced out of the market. This is called adverse selection, since only the low quality market would persist (Akerlof 1970). This problem of quality uncertainty is especially important for **credence goods** like organic goods (Giannakas 2002).

Third party certification is a viable solution to sort out the problem of quality uncertainty related to organic food (Golan et al. 2001; Giannakas 2002). Without certification, consumers would face severe quality uncertainty and high potential for mislabelling. Consumers willing to buy organic food would face huge information costs in order to reliably check the organic quality. The certifier as independent third party next to the producer and consumer provides the quality information based on the European regulation on organic food (the standard) which is enforced by the control system and the governmental supervision. The corresponding labelling can be a useful tool for producers to signal organic quality to consumers in a way that the latter can reliably identify organic food.

⁷ Lippert further distinguished credence goods into goods whose quality could be assessed by an “expert buyer” at high costs and goods with “immaterial credence quality” whose quality could not reliably be assessed even by an expert buyer. His examples for the process quality are the compliance with social or animal welfare standards, which cannot be tested on the product itself.

⁸ Giannakas expressed this very simple: “consumers do not know whether a product is organic unless they are told so” (Giannakas 2002).

2.2.2 Transaction cost economics ⁹

Organic food products are credence goods (Darby and Karni 1973). Due to the information asymmetry illustrated above, certification is necessary. Certification is seen as an instrument that can reduce the costs related to the exchange of a good, which are called **transaction costs** (Williamson 1985). The idea that exchanging a good (commodity or service) is costly is pivotal for the concept of **New Institutional Economics**.

The existence of transaction costs is caused by bounded rationality (see also Chapter 2.2.1) and potential **opportunism** sometimes along with **asset specificity**. Since nobody is fully informed (bounded rationality), “*frictions*” (Furubotn and Richter 2005) occur when goods and services are exchanged. Opportunism means that humans are self-interested and likely to be dishonest (e.g. by “*lying, stealing, cheating*” (Williamson 1985)) to be better off. The concept of opportunistic behaviour is of specific relevance in the case of organic food products, since there is a considerable price premium compared to conventional products in combination with the credence quality. Economically spoken, there are “*incentives for the mislabelling of conventional food as organic*” (Giannakas 2002). The combination of bounded rationality and the risk of opportunism activates uncertainty and results in considerable transaction costs.

Transaction costs can be reduced by implementing an organic standard against which products are controlled and certified. Pivotal for the function of a certification system is the enforcement including penalties in case of **non-compliance** in order to strengthen truthful claims (Golan et al. 2001). By the implementation of such a control system, uncertainty is reduced and consumers can easily and reliably identify organic products. Hereby, the existence of the organic market is assured and transaction costs are lowered, although such a system still induces substantial costs.

The following section aims to structure and define the different types of transaction costs, which are specifically relevant for organic producers. The estimation of the costs of the organic certification system will be performed in work package 2 of the CERTCOST project.

Transaction costs

The concept of Transaction Cost Economics is widely applied in different areas. However, empirical application in terms of exemplary breakdown or even cost estimation can rarely be found (Furubotn and Richter 2005). Wang (2003) provides a short, but comprehensive overview on the diverse utilisation of transaction cost measurements in different economic fields. Fundamental studies in transaction cost economics are discussed and integrated in the textbook “*Institutions & Economic Theory*” by Furubotn and Richter (2005).

⁹ This section draws upon “*Organic farming certification – the costs of reducing transaction costs*” (Zorn 2008), a presentation held in September 2008 at the “18. Jahrestagung der Österreichischen Gesellschaft für Agrarökonomie” in Vienna/Austria.

Occurrence and types of transaction costs

We define the term transaction costs as the cost related to the exchange of an organic food product not including the cost of the good itself.¹⁰ Transaction costs occur in different forms and with specific characteristics: they can either be variable or fix, appear as **cash-based** or as **opportunity costs**. Basic categories of transaction costs are:

- market transaction costs,
- managerial transaction costs, and
- **political transaction costs** (Furubotn and Richter 2005).

Market transaction costs

The most important category of transaction costs for organic certification systems is **market transaction costs**. These are defined as costs of using the market as point of exchange. In general, four categories of market transaction costs are distinguished:

- 1) search and information costs,
- 2) bargaining and decision costs,
- 3) supervision and enforcement costs, and
- 4) costs for investments in social relations (Furubotn and Richter 2005).

Organic certification systems intend to lower market transaction costs by providing reliable certification. Certification lowers considerably the search and information costs and the supervision and enforcement costs of consumers. By certification and according labelling, consumers can easily and reliably identify organic food products. Controlling (supervising) the organic quality is done by professional experts. Although controls are costly, performing these in a certification system is cheaper compared to a situation where every organic food consumers would have to check the organic quality her-/himself – which beyond that is quite difficult for a non-expert. Therefore, the market transaction costs related to the exchange of a good are considered most important.

The market transaction costs and the specific costs of using the organic market will be structured in the following part.

Search and information costs

Before the actual exchange can take place, the seller has to find a buyer and exchange information on the good, e.g. its quality and price, and collect information on the buyer, e.g. the credibility or the solvency of the buyer. In this regard, there exists only a small difference in the search and information costs between non-organic and organic markets. However, higher search and information costs may arise due to asset specificity since the organic sector is still relatively small (organic producers, for example, may need to put more effort in finding a certified processor, or a distributor of a particular distribution channel).

¹⁰ *Alternative definitions of transaction costs are given by Furubotn/Richter (2005).*

Specific for organic farming is the duty to keep updated on the ever changing requirements of the organic standards. This requires considerable efforts by the organic operators (Schmid 2005; Koesling et al. 2008). E.g. because the requirements for using inputs like fertilisers and plant protection products are very detailed, related search and information costs are assumed to be higher in organic farming than in conventional farming.

Bargaining and decision costs

These costs occur when bargaining e.g. prices and other conditions of a trade and deciding for or against it. The more complex an exchange, the higher are its bargaining and decision costs. This cost category is considered to be of similar magnitude in transactions of organic and non-organic products, although the relatively small organic market (in comparison to conventional food markets) could result in higher bargaining and decision costs.

Supervision and enforcement costs

The category of supervision and enforcement costs, however, are unique in the organic product case. A compulsory system of supervision and enforcement for the organic market, the inspection and certification system, has been designed and implemented by the EU organic regulation, Council Regulation (EC) No 834/2007. This system ties up market access to ex-ante inspection and certification. Hereby, the duty of supervising organic quality is to a large extent transferred from the buyer to the seller. This differs from the usual classification of supervision costs in the literature as ex-post transaction costs.

In order to be certified organic, a farmer has e.g. to commission a certification body, to fulfil specific documentation requirements or to apply for an exception in case of need. These specific requirements add up to considerable costs, either cash-based (e.g. the certification fees) or opportunity costs (e.g. the utility foregone for the time spent on documentation).

Setting up, maintaining and running a private control system can also be seen as supervision and enforcement costs, since participation is voluntary.

Costs for investments in social relations

These costs occur e.g. when meeting clients in order to foster relations and to build up a trustful relationship. These types of relations are of special importance within the organic sector, where the so-called direct marketing exists as a viable solution for selling. Therefore, one could assume these costs being higher than in non-organic systems.

Political transaction costs

Any transaction, either intra-firm or market transaction, occurs in a well designed institutional system of a polity. Setting up, maintaining and changing, i.e. administrating this system is costly (Furubotn and Richter 2005). With regard to organic farming, the costs of implementing an organic control system can be regarded as **administration costs**. A good and up-to-date example for a small fragment of these costs, are the public but also private resources spent in the

process of revising Regulation (EEC) No. 2092/91 and deciding on Regulation (EC) No. 834/2007 on organic production and labelling.

Managerial transaction costs

Managerial transaction costs represent the costs related to the intra-firm exchange of goods. Miller and Vollmann (1985) refer to the “*hidden factory*”, which exists inside the firm next to manufacturing (therefore hidden) to point out the high importance of these costs.

The two tables on the following pages structure the market and political transactions costs using two examples. Transaction costs considered specific for organic trade are highlighted in the tables.

Chapter 2_Theoretical framework

Cost category	FARMER		CONSUMER		PUBLIC ADMINISTRATION
	Cash-based costs	Opportunity costs	Cash-based costs	Opportunity costs	Cash-based costs
Search and information costs	Buying a market stand to sell products on the local market Publishing publicity in local newspaper	Presenting tomatoes on the market stand when standing there Promoting the tomatoes to consumers by informing them on their quality	Bus ticket to the market Buying one tomato to taste, i.e. test the quality	Time spent on the bus to get to the market place Time spent on the market in order to find an appropriate tomato seller Time spent looking for red, tasty, organic tomato and its price	Shopping guide on organics
Ex-ante information on market access requirements (reg. (EC) 834/2007)	Professional journals (e.g. updating on regulation)	Time spent for searching, analysing and evaluating information data			
Quality information	Providing appetisers/product samples to consumers	Grading of the tomato (e.g. Class or quality I tomato)		Information on the organic quality in general, e.g. reading info brochure	Informing consumers (fair, brochure, EU homepage on organic food as part of the information campaign)
Specific quality information (e.g. Bioland label)	Membership and licence fees for organic association and the use of its logo				
Bargaining and decision costs		Time to bargain		Time to bargain	
Supervision and enforcement costs of the trade					
Test the quality of the product				Check for tomatoes' quality (organic, size) Reweighing the tomatoes at home	Food monitoring programs
Control the quantity		Counting the money			
Inspection and certification	Fee for control body (Extra-fee for extra-ordinary inspection time, e.g. bad preparation by the farmer)	Time spent for preparing the visit and during the visit			Supervision ("inspection of the inspection") and additional inspections
Inspection visit	Expenditure for software, files, paper and pencil	Documentation time (on the market and in the office)			
Documentation (required for inspection & certification)	Phone / postal charges	Filling in the corresponding forms			
Authorisation of exception (if applicable)	Phone / postal charges	Providing missing documents - e.g. ask suppliers for certificate and send it to the control body			
Fulfilling inspections visit's extra requirements					
Customer complaints	Compensation with alternative tomato	Answering complaints, discussing misunderstandings		Complaining about spoiled tomatoes	
Cost of settling law suits	Court and lawyer fees - usually the loser of a law suit pays everything	Time to inform the lawyer, to make testimony	Court and lawyer fees - usually the loser of a law suit pays everything	Time to inform the lawyer, to make testimony	
Social relations					
Contacts with colleagues, clients		Time spent on meetings (without informational character)			
Costs of specific relevance for					

Table 1: Structuring market transaction costs – example A: Farmer selling tomatoes to consumers

Chapter 2_Theoretical framework

Cost category	FARMER		PROCESSOR		PUBLIC ADMINISTRATION
	Cash-based costs	Opportunity costs	Cash-based costs	Opportunity costs	Cash-based costs
Search and information costs	Phone costs for contacting interested parties Admission ticket for fair	Visiting a fair	Presenting the company: fair, publicity in journals, buying agent	Time spent searching for suppliers Time spent for market analysis (traded classes, qualities and prices)	Monetary System
Communication costs Ex-ante information on market access requirements (EEC reg. 2092/91 resp. 834/2007) Quality	Postal and telephone charges Professional journals	Time spent for searching, analysing and evaluating information data	Postal and telephone charges	Looking for organic tomato with the desired characteristics	Defining food safety requirements
Organic Certificate	Providing appetisers/trial offers to the consumer	Grade classification of the tomato (e.g. Class I tomato)		Information on the organic quality in general, e.g. info brochure	Defining grades and minimum quality requirements for specific products
Specific quality information (e.g. Bioland label)	Corresponding communication expenses	Providing possible clients organic guarantees via the certificate		Checking / reassuring the provided information on organic certificate (e.g. via database www.bioC.info)	
Bargaining and decision costs	Lawyer costs, e.g. for preparing the content of a contract	Time to bargain Intra-firm consultations	Lawyer costs, e.g. for a contract (the higher uncertainty, e.g. on quality or due to a long term obligations, the more complicated the agreement, the higher bargaining costs)	Time to bargain Intra-firm consultations	
Supervision and enforcement costs of the trade					
Test the quality of the product			Incoming inspection (samples on residues)	Check for tomatoes' quality (size, organic) partly EX ANTE, then also information costs	Food monitoring programs
Inspection and certification Inspection visit	Fee for control body (Extra-fee for extra-ordinary time consuming, e.g. bad preparation by the farmer)	Time spent for preparation and during the visit	Fee for control body Sending own inspector to suppliers' farms (additional inspections for organic quality)	Time spent for preparation and during the visit	Supervision ("inspection of the inspection") or additional inspections
Documentation (required for inspection & certification)	Expenditure for software, files, paper and pencil	Documentation time	Buying software for documenting the flow of goods	Documenting (invoices, recipes, flow of goods, sales, labels, exceptions, ...)	
Authorisation of exception (if applicable)	Phone and postal charges	Information on and applying for exception, filling in the corresponding forms	Phone and postal charges		Checking for the need of exceptions and deciding on their coverage and duration
Fulfilling inspections visit's extra requirements	Postal charges	Providing missing documents - e.g. ask suppliers for certificate and send it to the control body	Postal charges	Providing missing documents - e.g. ask suppliers for certificate and send it to control body	
Customer complaints	Price reduction ex post	Answering complaints, discussing misunderstandings		Complaining about tomatoes not fulfilling the agreed characteristics	
Cost of settling law suits	Court and lawyer fees - usually the loser of a law suit pays everything	Time to inform the lawyer, to make testimony	Court and lawyer fees - usually the loser of a law suit pays everything	Time to inform the lawyer, to make testimony	Legal system
Social relations Contacts with colleagues, clients		Time in meeting (not of an informative nature)	Booth on trade fair	Presenting the company on trade fair	
Costs of specific relevance for					

Table 2: Structuring market transaction costs – example B: Farmer selling tomatoes to a processor

2.3 Economics of crime

Economists take an interest in costs and benefits; this perspective is also relevant regarding the economic analysis of crime. In the case of organic farming, “*crime*” directly refers to the conscious severe non-compliance with the EU regulation respectively with private standards, in the following called fraud. The economic analysis refers to the costs and benefits of crime, which are analysed both from the perspective of an individual and from the societal level.

According to the economics of crime, opportunistic individuals decide between complying with a law or not based on rational considerations by comparing the total pay-off of the two alternatives (Eide 2000). The fundamental relevance of these theoretical considerations for the organic control systems derives from Council Regulation (EC) No 834/2007, Art. 27: this article requires that “*nature and frequency of the controls shall be determined on the basis of an assessment of the risk of occurrence of irregularities and infringements as regards compliance with the requirements laid down in this Regulation.*” This means, that the Regulation requires that the control body considers the risk of an operator committing fraud, when determining the number and kind of controls (**risk based control**). Based on economic theory, the main influencing factors whether an opportunistic individual will commit organic fraud or not is illustrated in this chapter.

The asymmetric information between buyer and seller obviously increases the propensity to opportunism. Therefore, there is a fundamental possibility for fraud connected to the marketing of organic food products. This assumption does not mean that fraud is omnipresent among organic farmers and producers. It rather refers to certain risks, which are constrained by formal and informal rules (institutions), that structure and order economic actions. Examples of fraud can be mislabelling of conventional as organic food (including **commingling**) in order to obtain the organic price premium (Gesellschaft für Ressourcenschutz (GfRS) 2003) or using forbidden inputs (e.g. pesticides, fertilisers, additives) during the production process, in order to reduce costs and / or to increase the yield.

Based on Becker’s model on the “*supply of offences*” (Becker 1968), the factors determining organic fraud are illustrated:

- 1) the income (monetary profit) of an offence,
- 2) the probability that non-compliance is detected and,
- 3) the penalty (monetary fine plus other sanctions) in case of detection and the according punishment. An opportunistic individual decides by comparing the expected utility of the alternatives complying with the standard or cheating, given the determinants above.

The income of crime

The income of an organic fraud results either from decreasing costs or increasing benefit. This varies across areas of production, products, and operators and in the course of time.

The opportunistic individual compares the expected utility resulting from present and future incomes in the case of either complying with the organic standard or cheating. Compliance will result in an income based on regular production costs and organic prices and quantities. The expected utility from non-compliance results from two shares: first the discounted¹¹ income stream from successful cheating and, second, the discounted income stream from revealed cheating including penalties. These shares are weighted by the assumed probability of being detected and the probability of undetected cheating, yielding the expected utility of non-compliance. The opportunistic individual will opt for the alternative, whose utility is expected to be higher.

If the individual wants to act on the organic market in the future, she/he has equally to consider potential future benefits and costs by discounting these. The interest rate used for discounting future cash flows differs between individuals – economists say, that they exhibit different time preferences. This is of high importance, since a high time preference (focus on present income) implies a higher risk of fraud: e.g. somebody in financial problems (high time preference) could be tempted to solve these problems by cheating, neglecting the risk of potential reputation loss and the resulting future income losses. A fundamental calculation of an opportunistic individual comparing the expected utility from complying and from cheating is illustrated in Box 1.

Decision situation of an opportunistic individual comparing the expected utility from the income from	
a) complying with the standard and b) not complying with the standard	
a) Compliance	b) Non-compliance
$EU_c = U(Y_c^{NPV})$	$EU_{nc} = (1-w) U(Y_{nd}^{NPV}) + w U(Y_d^{NPV})$
with	with
EU _c Expected utility in case of compliance	EU _{nc} Expected utility in case of non-compliance
U Utility	Y _{nd} ^{NPV} Net present value of today's and future income when never detected
Y _c ^{NPV} Net present value of today's and future income when always complying	Y _d ^{NPV} Net present value of today's and future income when detected
	w Detection probability

Box 1: Decision situation of an opportunistic individual.

The income illustrated in the formulas in Box 1 is dependent on many factors. Among others, important factors are the prices of organic and conventional products, the quantities yielded by different production processes (e.g. compliant vs. non-compliant production), the costs of production, the discount rate (cf. above) and the fine in case of detection (cf. below).

The probability that crime is detected

The probability that organic fraud is detected is also very relevant for the decision making of an opportunistic individual. Whether fraud is detected or not, is mainly determined by the kind of infringement and the control system. Some infringements like the use of forbidden substances may be detected by sample analysis, whereas others, e.g. commingling with a conventional fraction without

¹¹ Future incomes have to be discounted in order to obtain their present value.

pesticide residues, are very difficult to detect. The control system can affect the detection probability by the frequency and kind of controls (unannounced vs. announced), the selection of operators for additional controls as required by the concept of risk-based controls, the qualification of the **inspectors** and their elaborateness. The magnitude of these factors will be further analysed based on data on organic controls of control bodies in work package 4 of CERTCOST.

The penalty

The penalty can consist of financial, psychic and social sanctions. Prosecution of fraud in organic trade is performed by the judicial system of the Member States, so the national law applies and there is no uniform sanction system. Financial sanctioning of fraud can be a direct penalty, the reclaim of agri-environmental payments and future losses (e.g. prohibition of marketing organic products for a certain period of time) and can relatively easily be measured. Psychic and social sanctions can be the loss of reputation and esteem of others or the restriction in freedom due to imprisonment. To compare different kinds of fines, the psychic and social sanctions have to be converted into monetary equivalents. The monetary value of an imprisonment may be calculated as the sum of discounted earnings foregone and the – individually different – value of the restriction in freedom (Becker 1968).

Increasing the detection probability, e.g. by altering the control system, or increasing the fine would lower the expected utility of cheating and accordingly the number of frauds. However, controls as well as enforcement and fines are costly (e.g. the costs of lawsuits or imprisonment); consequently the question of the optimal level of detection probability and penalties arises. In order to determine the optimum, the social costs of fraud have to be considered. In case of mislabelling of organic food, the damage a consumer faces is not easily determined (Stigler 1970; Scheerer et al. 2007), but is at least the price difference between the organic and the conventional product. Societal damage could result from foregone positive external effects¹² that result from organic production. From a social perspective, the variables that can be influenced are the detection probability and the fine (penalty). Their optimum level is given by the minimum of the cost sum of (i) the total costs of fraud (damage from cheating), (ii) the costs of controls, prosecution and conviction and (iii) the costs of the punishment (e.g. imprisonment) (Becker 1968; for a first application of his approach to organic farming controls, see Lippert et al. 2009).

Supervision and Enforcement

The supervision of the control bodies is an important tool to guarantee a functioning control system. This especially applies for competitive control markets with some or many different control bodies offering their service (Zorn and Renner 2008). In countries where operators can choose between many control bodies (e.g.

¹² *Positive external effects are of organic farming are for example positive environmental contributions of this farming system. Externalities by definition are not reflected in the price of a good. If the non-compliance with regard to an organic standard consists in using forbidden pesticides, the positive environmental effects cannot be attained.*

Germany with 22 or Italy with 20 control bodies) this is of high relevance. Here, operators can change to another control body in case of dissatisfaction with the service provided or the result of the control (e.g. the way controls are performed or penalties are given). Supervision of controls and harmonisation of penalties is important in order to guarantee equal conditions for all organic operators.

Another crucial point is the enforcement of Council Regulation (EC) No 834/2007, since imperfect enforcement can lower the cost of punishment and hereby also lower the deterrence of operators from cheating. The responsibility for prosecution lies with the member states (Giannakas 2002). The costs of prosecution can differ between Member States and so can jurisdiction, with regard to the penalties. Organic farming is sometimes still called a niche market. Apparently, that applies to organic fraud lawsuits, too, where decision making can require specific knowledge necessary for correct enforcement of the laws.

3 BENEFITS AND COSTS OF ORGANIC CERTIFICATION

The relevance of the costs of an organic certification system in the EU according to the Council Regulation (EC) No 834/2007 came up when discussing the optimal level of controls and sanctions. From a societal viewpoint, the implementation of such an extensive control system only makes sense, when the benefits exceed the costs of the system. The same applies to private standards and their implementation. Nevertheless, a considerable number of private organic standards and a huge number of public and private control bodies are involved in organic certification.

At present, only a few studies exist on the costs of organic certification (Mora and Menozzi 2005; Santacoloma 2007b; Santacoloma 2007a) and on quality assurance schemes in general (Krieger et al. 2007). These studies cover only parts of the system costs and benefits, leaving room for improvement.

This chapter aims to illustrate the most important categories of costs and benefits accompanying organic certification. Costs and benefits from organic certification appear as monetary (cash-based) and non-monetary values (Krieger et al. 2007). Non-monetary values may partially be converted into monetary values, e.g. by using the concept of opportunity costs (time units spent multiplied by the expected income per time unit), but they are generally tricky to evaluate.

3.1 Costs of organic certification

The fact that thousands of operators opt for the organic control systems implies that they assess a positive balance of costs and benefits. The financial burden from organic certification services is estimated to amount to 1.5% of organic retail turnover (Rundgren 2001). For European organic producers this would correspond

to more than 200 Mio. Euro for the year 2006.¹³ But this estimation only considers the cash-based costs (monetary expenditures) of certification. For the majority of organic operators, this is probably the most important share of the total costs, but other potentially significant burdens are not covered by this estimate.

Generally, it is very difficult to provide reliable estimates for the costs of organic certification. This is mainly due to the different types of costs, i.e. monetary vs. non-monetary costs, of which especially the latter are difficult to survey. Some costs cannot completely be accounted to organic production. Besides, it is difficult to identify the exact share, which accounts to organic production.

The workload connected to certification is a significant part of the costs next to cash-based costs. Organic operators spend a considerable amount of time, in order to satisfy the requirements, especially the documentation requirements laid down in Council Regulation (EC) No 834/2007 and in private organic standards. Numerous examples for monetary (cash-based) and non-monetary (opportunity) costs are given in tables 1 and 2 (see above, chapter 2.2.2), structured according to transaction costs considerations. Some of these costs can be assigned to organic production exclusively (e.g. time spent on organic control visits), others serve different areas of an operation (e.g. documentation of incoming goods) and would also be carried out on a conventional farm.

The differentiation between the costs for introducing the certification system in an operation (during conversion) and the actual costs related to certification of the operation is important. The relevance of individual cost types differs during the different stages. Monetary and non-monetary information costs for example, usually are usually very high when entering into and during conversion of an organic operation. When the operation has been certified organic for a few years, information costs will decrease to a common level as long as the production type stays the same.

Transaction costs of the **conversion** of an operation, i.e. the costs of adapting the production and management processes to the organic system requirements, highly depend on the starting point and the area of production. In the long run, these costs are sunk costs¹⁴ and will therefore not specifically be considered, in the CERTCOST project although they can form considerable cost sums.

Setting up, maintaining and changing the organic control system for public as well as private standards also results in organic certification costs. Part of these costs is borne by the operators paying certification fees. Another part is paid by the tax payers, e.g. for drafting, discussing and deciding on EU and national organic regulations or the administration and supervision of the control system. Private institutions also bear costs relating to their contributions to the legislative procedure and for establishing private certification systems. This applies to national and international organic associations, e.g. IFOAM and their members.

¹³ *Zentrale Markt- und Preisberichtsstelle (ZMP 2008) reports the turnover of the European organic market to be 14.6 billion € in 2006.*

¹⁴ *Sunk costs are costs incurred in the past which cannot be recovered. An example is a building with only one specific usage. Sunk costs are irrelevant for decisions.*

The issue of organic certification costs and their distribution will be analysed in detail in work package 2 of the CERTCOST project.

3.2 Benefits of organic certification

Due to the specific characteristics of organic food products (see also 2.2.1), governmental action is essential to ensure the organic market and to protect producers from unfair competition as well as consumers' interest by defining what exactly characterises organic food. Functioning markets fulfil important functions, assuring society's interests (efficient allocation of resources, welfare), as well as operators' (competition and differentiation) and consumers' interests (satisfying their demand for organic products). Furthermore, organic production delivers public goods to the society contributing to environmental protection and rural development. The regulatory governmental action of the European Union is based upon this "*dual societal role*" of organic food and farming (EC 2007, preamble).

An organic standard and its effective implementation fulfils important economic functions (Will and Guenther 2007). By defining basic requirements, organic standards facilitate coordination along the supply chain. Furthermore, these standards lower transaction costs considerably.

Operators experience different benefits from certification. Most important is the assurance of the organic market and the access to it, offering the possibility to differentiate from other producers. By successful certification, operators are able to benefit from consumers' usually higher willingness to pay for organic products. Council Regulation (EC) No 834/2007 has the function of a minimum quality standard, organic food products have to comply with. Hereby, fair competition between producers is ensured, since every organic food product has to comply at least with this basic standard.

The documentation requirements of organic certification may have advantages in relation to the daily management (Kontogeorgos and Semos 2008). For example, the inspection of incoming goods, which is of specific relevance for organic operators, has somehow to be performed by every operator. In case of organic certification, this inspection has to meet certain requirements and hereby leads to a structured and well documented approach. The resulting documentation and transparent, well-structured processes may have positive effects on other managerial tasks, e.g. by reducing rework (e.g. documentation for quality assurance schemes or **traceability**) and saving costs (Krieger et al. 2007).

For consumers, organic labelling is an effective tool to overcome the information problem illustrated in chapter 2.2.1. By exactly defining what makes up organic food by setting up a standard, the costs of monitoring and enforcement of consumers can be reduced. Consumers can identify easily and at low costs organic food products and satisfy their demand. Given market transparency by a standard and consumers' confidence in the control system, organic markets can further develop and grow (McCluskey 2000).

Chapter 3_Benefits and costs of organic certification

The application of economic concepts to organic certification is of high relevance for the CERTCOST project. Using economic concepts allowed us to structure and explain what we observe in the real world of organic food. When formulating the project's final results, economic theory can provide a basis for recommendations on how to further improve the European organic certification system.

ANNEX: GLOSSARY

This glossary compiles terms relevant for the project CERTCOST and separates them into two parts: Part A - Inspection and certification and Part B - Economic terms.

The terms regarding inspection and certification (Part A) were gathered from existing regulations, publications and glossaries and then analysed. Primarily considered were definitions given in public documents of the European Union, especially the Council Regulation (EC) No 834/2007. In addition, the glossary is based upon publications from the following institutions:

- Food and Agricultural Organization (FAO),
- Codex Alimentarius Commission (CAC),
- International Task Force on Harmonisation and Equivalence in Organic Agriculture (ITF), convened by FAO, IFOAM and UNCTAD, the United Nations Conference on Trade and Development,
- International Federation of Organic Agricultural Movements (IFOAM),
- United States National Organic Program (**NOP**),
- Gesellschaft für Technische Zusammenarbeit (GTZ) – a private German institution for technical cooperation linked to the German Federal Ministry for Economic Cooperation and Development.

Part B is based on basic economic literature and illustrates terms and concepts relevant for the CERTCOST project.

GLOSSARY PART A – INSPECTION AND CERTIFICATION

Term	Definition / description
Accreditation	<p>Procedure by which an authoritative body (this can either be a public or a private accreditation body) gives a formal recognition that a body is competent to provide inspection and certification services (International Task Force (ITF) 2007). In the European Union, organic control bodies have to be accredited to European Standard EN 45011 or ISO Guide 65.</p>
Approval	<p>Procedure by which a body (other than an accreditation body) gives a formal recognition that a body or person is competent to carry out specific tasks (International Task Force (ITF) 2007).</p> <p>Following Council Regulation (EC) No 834/2007, Article 27(4b), the competent authority from a member state shall approve organic control bodies before they can offer their services. The method and criteria how to approve control bodies are laid down by the European Commission (Council Regulation (EC) No 834/2007, Article 38).</p>
Certificate	<p>A certificate in the context of organic food and farming is a document certifying an operator that she/he has fulfilled the requirements of an organic standard. This document is issued by the control body after having controlled an operation declaring that it is in conformity with the organic production or processing standards. Therefore, the term certificate of conformity is used.</p> <p>A certificate serves as communication between seller and</p>

buyer in contrast to a label, which is a form of communication to the consumer (Dankers and Liu 2003).

For transactions between certified organic operators, a lot is accompanied by a transaction certificate. This kind of certificate is compulsory for imports to the European Union.

The EU differentiates the transaction certificates in the trade of organic products with third countries: For the import of compliant products, “*documentary evidence*” is required in order to identify the “*operator who carried out the last operation*” and to verify the compliance of the product imported with Council Regulation (EC) No 834/2007. When importing equivalent products, a “*certificate of inspection*” is required.

Certification	Procedure by which a certification or control authority or body (a third party) gives written assurance that a product, process or service is in conformity with certain standards (Codex Alimentarius Commission 1995), is called certification.
Certification body	Organisation that conducts certification. See also “ <i>Control body</i> ”.
Commingling	“ <i>Physical contact between unpackaged organically produced and non-organically produced agricultural products during production, processing, transportation, storage or handling, other than during the manufacture of a multi-ingredient product containing both types of ingredients</i> ” (United States Department of Agriculture - Agricultural Marketing Service 2000).
Competent authority	Following the definition in the Council Regulation (EC) No 834/2007, the competent authority is the “ <i>central authority of a Member State competent for the organisation of official controls in the field of organic production in accordance with the provisions set out under this Regulation, or any other authority on which that competence has been conferred to; it shall also include, where appropriate, the corresponding authority of a third country</i> ”.
Compliance	<p>Compliance is fulfilling specific requirements, like e.g. the production rules of Council Regulation (EC) No 834/2007.</p> <p>In trading of organic foods with third countries, the European organic regulation differentiates between compliant products (Article 32) and equivalent products (Article 33). When importing into the EU via Article 32, the production and control have to comply with Council Regulation (EC) No 834/2007. In the case of equivalence, imports via Article 33 require equivalent production rules and equivalent control effectiveness.</p>

<p>Control,</p> <p>Synonyms: Inspection (NOP), Audit (FAO)</p>	<p>An on-site visit of operators in order to verify that their performance is in accordance with a particular set of production or processing standards is called control (Dankers and Liu 2003; International Task Force (ITF) 2007).</p> <p>Controls can be categorised into announced and unannounced controls. Furthermore, the following types of controls are differentiated (Rundgren 2007):</p> <p style="padding-left: 20px;">An <u>initial control</u> is the first visit to an operator who is in the process of converting to organic. This first visit usually is more time-consuming than routine controls, since a lot of data has to be collected.</p> <p style="padding-left: 20px;">A <u>routine or regular control</u> is a physical inspection of an operator and usually is scheduled (announced) but can also occur as an unannounced inspection. The key aspects of an operation are examined during a routine control. Since this kind of control usually is performed once a year, it is also called an annual control.</p> <p style="padding-left: 20px;">A <u>random or spot-check control</u> is conducted primarily unannounced. Random controls shall be based on the risk of non-compliance with the organic standard, previous control results, the quantity of products concerned and the risk for exchange of products according to Commission Regulation (EC) No 889/2008, Article 65(4).</p> <p style="padding-left: 20px;">A <u>follow-up control</u> results from another precedent control. The reasons for a follow-up control are varied. Such a control has got the character of a sanction, if an operation was not perfectly prepared for certification during the routine control or the certification body has required the control of corrective actions, which should be implemented.</p>
<p>Control authority</p>	<p>Council Regulation (EC) No 834/2007, Article 2(o), defines the control authority as follows: <i>“public administrative organisation of a Member State to which the competent authority has conferred, in whole or in part, its competence for the inspection and certification in the field of organic production in accordance with the provisions set out under this Regulation; it shall also include, where appropriate, the corresponding authority of a third country or the corresponding authority operating in a third country”</i>.</p>
<p>Control body</p>	<p><i>“Independent private third party carrying out inspection and certification”</i> Council Regulation (EC) No 834/2007, Article 2(p).</p> <p>In Council Regulation (EC) No 834/2007 on organic production and labelling of organic products, the term control body is used throughout. This regulation does neither use the term ‘inspection body’ (which was used in the Council</p>

Regulation (EEC) 2092/91) nor ‘certification body’.

The certification process is sometimes divided into inspection (visiting and controlling operators) and certification (issuing the certificate). Accordingly the different institutions carrying out the different jobs are distinguished as the inspection body (body performing the inspection part of certification. Where a certification body performs its own inspections, the certification body is both the inspection body (Dankers and Liu 2003)) and the certification body (organisation performing certifications; the certification body may use an existing standard or may set its own standard, based on an international and/or normative standard (Dankers and Liu 2003; International Task Force (ITF) 2007)).

See also “*Control authority*” for public bodies that are in charge of inspection and certification.

Control label	Label or symbol indicating that compliance with specific standards has been verified. The use of a label is controlled by the standard-setting body (e.g. the European Commission, national governments or private organic associations). Labels serve as information for consumers and can help them to identify organic products (Dankers and Liu 2003).
Conversion	<i>“Conversion means the transition from non organic to organic farming within a given period of time, during which the provisions concerning the organic production have been applied”</i> Council Regulation (EC) No 834/2007 Article 2(h).
Documentary evidence	Specific term for the transaction certificate required for the import of compliant organic products (Art. 32 of Council Regulation (EC) No 834/2007) into to European Union.
Equivalence	When describing different systems or measures, equivalence means that they are <i>“capable of meeting the same objectives and principles by applying rules which ensure the same level of assurance of conformity”</i> (compared to Council Regulation (EC) No 834/2007, Article 2(x)). The EC definition relates both, to third countries and to control bodies. For each category, a list will be compiled with equivalent certification systems respectively control measures (Council Regulation (EC) No 834/2007, Article 33). See also “ <i>Compliance</i> ”.
	The ITF defines equivalence as <i>“acceptance that different standards or technical regulations on the same subject fulfil common objectives”</i> (International Task Force (ITF) 2007).
EN 45011	See “ <i>ISO 65</i> ”.
Harmonisation	Harmonisation is the process by which standards, technical regulations and conformity assessment on the same subject approved by different bodies establishes inter-changeability of

	products and processes. The process aims at the establishment of identical standards, technical regulations and conformity assessment requirements (International Task Force (ITF) 2007).
Horizontal standard	Horizontal standards entail rules that apply across the food chain, ranging from farm to fork like e.g. standards on labelling, food hygiene (Will and Guenther 2007).
Infringement	Severe case of non-compliance with Council Regulation (EC) No 834/2007 and the corresponding international and national implementing rules. See also “ <i>Non-compliance</i> ”.
Inspection	See “ <i>Control</i> ”.
Inspection body	See “ <i>Control body</i> ”.
Irregularity	Case of minor non-compliance with regulation Council Regulation (EC) No 834/2007 and the corresponding international and national implementing rules. See also “ <i>Non-compliance</i> ”.
ISO 65 (EN 45011)	<p>ISO is the abbreviation for the International Organization of Standardization, a non-governmental organisation. The abbreviation ISO is derived from the Greek word <i>isos</i> (equal). ISO does not certify nor accredit, it only sets standards for sectors, quality management and conformity assessments systems.</p> <p>ISO Guide 65 on “<i>general requirements for bodies operating a product-certification system</i>” describes in general the requirements for documentation, quality management and internal review in a certification body. This guide is not specific for organic certification. The European and Japanese organic regulations refer to ISO 65 as compulsory for a control body. The European Norm (EN) 45011 is identical to ISO Guide 65 (Rundgren 2007).</p>
Inspector	The person appointed to undertake the inspection is called the inspector. It may be an independent operator or an employee of the control or inspection body. Sometimes, the inspector is also called the auditor (Dankers and Liu 2003).
Labelling	Council Regulation (EC) No 834/2007, Article 2(k) defines labelling as “ <i>any terms, words, particulars, trademarks, brand name, pictorial matter or symbol relating to and placed on any packaging, document, notice, label, board, ring or collar accompanying or referring to a product</i> ”.
National Organic Program (NOP)	“ <i>The National Organic Program (NOP) develops, implements, and administers national production, handling, and labeling standards for organic agricultural products</i> ” in the United States of America. “ <i>The NOP also accredits the certifying</i>

agents (foreign and domestic) who inspect organic production and handling operations to certify that they meet USDA standards.” (United States Department of Agriculture - Agricultural Marketing Service 2008). The NOP came into force in October 2001.

Non-compliance *“Any situation or action that leads to the operator’s or production’s not fulfilling in some way the standards or the requirements set”* is defined as non-compliance. Non-compliance can be classified and described by many terms, among them non-conformities, *“deficiencies, violations, transgressions, infringements, irregularities, fraud and deviation”* (Rundgren 2007).

Synonym:

Non-conformity

Council Regulation (EC) No 834/2007 does not provide definitions of the terms non-compliance, infringement and irregularity with regard to organic production standards, although these terms are used in the European organic regulation. In Article 30, the consequences in terms of severity of an irregularity and an infringement are differentiated. In case of an irregularity, the EU regulation foresees that no reference to organic shall be made on the affected product or lot. In case of a severe infringement, the operator may not be allowed to market organic products for a specified period.

For CERTCOST, we want to use the term non-compliance as generic term for any violation of Council Regulation (EC) No 834/2007. Non-compliance can further be differentiated into rather slight violations, called irregularities, and serious violations of the regulation, called infringements.

Operator

Operator means any person – natural or legal – who produces, prepares or imports, with a view to the subsequent marketing thereof, food products, or who markets such products (Codex Alimentarius Commission 2007a).

The current EU organic regulation (Council Regulation (EC) No 834/2007, Article 2(d)) introduced a new, more precise definition for the operator being the *“natural or legal persons responsible for ensuring that the requirements of this Regulation are met within the organic business under their control.”*

The activities covered entail the production, preparation, storage, import and marketing (distribution) of organic products.

Preparation

Preparation *“means the operations of preserving and/or processing of organic products, including slaughter and cutting for livestock products, and also packaging, labelling and/or alterations made to the labelling concerning the organic production method”* (Council Regulation (EC) No 834/2007,

Article 2(i)).

Private standard	<p>Private standards are set by private actors while the government or its public agencies may have issued national public standards, i.e. regulations and guidelines, which may be stricter than Council Regulation (EC) No 834/2007. Private standards exist on regional, national and international levels for food products (Will and Guenther 2007). In the organic sector, these standards are set by growers' associations, umbrella organisations and sometimes by certain certification bodies.</p> <p>Private organic standards are often stricter in some areas than Council Regulation (EC) No 834/2007 which has the function of a minimum organic quality standard.¹⁵ Associations and companies can use private standards in order to differentiate their products from competitors and to enhance their relative market position. Private standards can become a de-facto-minimum quality standard, when their market significance is very high.</p>
Processing	<p>In the NOP, processing is defined as: "<i>Cooking, baking, curing, heating, drying, mixing, grinding, churning, separating, extracting, slaughtering, cutting, fermenting, distilling, eviscerating, preserving, dehydrating, freezing, chilling, or otherwise manufacturing and includes the packaging, canning, jarring, or otherwise enclosing food in a container</i>" (United States Department of Agriculture - Agricultural Marketing Service 2000).</p> <p>The European food legislation, i.e. both the Regulation (EC) No 178/2002 on the general principles and requirements of food law and the Council Regulation (EC) No 834/2007, does not provide a definition of processing.</p>
Regulation	<p>Following the differentiation of the World Trade Organization, mandatory rules are called (technical) regulations in separation from a standard to which compliance is not mandatory (Bonsi et al. 2008).</p>
Risk	<p>Risk is understood differently in different regulations. The European basic food law defines risk as "<i>a function of the probability of an adverse health effect and the severity of that effect, consequential to a hazard</i>" (Regulation (EC) No 178/2002, Article 3(9)).</p>

¹⁵ The classification of Council Regulation (EC) No 834/2007 as minimum quality standard results from the requirement that every food product that is labelled "organic" has to comply with this regulation. Other organic standards in the European Union can only be stricter than Council Regulation (EC) No 834/2007. In areas of farming or processing, where other standards do not specify stricter or any rules, Council Regulation (EC) No 834/2007 is directly effective.

The Council Regulation (EC) No 834/2007 is one of the few if not the only within the important governmental organic regulations like NOP and JAS, that specifies the term risk. This regulation utilises the expression ‘risk’ in the sense of the probability of not fulfilling the organic regulation: “... *risk of occurrence of irregularities and infringements as regards compliance with the requirements laid down in this Regulation*” (Council Regulation (EC) No 834/2007, Article 27 (3)). See also “*Risk (economic)*” in Part B.

Risk assessment	<p>Risk assessment is the quantitative and if possible qualitative determination of risk.</p> <p>The general food law (Regulation (EC) No 178/2002) describes risk assessment as a “<i>scientifically based process consisting of four steps: hazard identification, hazard characterisation, exposure assessment and risk characterisation</i>”.</p> <p>In the context of an economic investigation of the organic certification system, risk and accordingly its assessment has two components: The first component is the probability of non-compliance with the provisions of the organic regulation. The second component is the (potential) damage generated by the different types of non-compliance (CERTCOST – Description of Work 2008).</p>
Risk based inspection	<p>Article 32 of Council Regulation (EC) No 834/2007 states that “<i>The nature of the supervision shall be determined on the basis of an assessment of the risk of the occurrence of irregularities or infringements of the provisions set out in this Regulation</i>”.</p> <p>Further specification of the Commission’s perception of risk is provided in Commission Regulation (EC) No 889/2008, Article 65(4), laying down detailed rules for the implementation of Council Regulation (EC) No 834/2007. When defining how random control visits have to be carried out, this regulation wants the control body to base these visits on “<i>the risk of non-compliance with the organic production rules, taking into account at least the results of previous controls, the quantity of products concerned and the risk for exchange of products</i>”.</p>
Risk management	<p>The process, distinct from risk assessment, of weighing alternative actions considering risk assessment and other factors relevant for irregularities, and, if needed, selecting appropriate prevention and control options (Codex Alimentarius Commission 2007b).</p>
Standard	<p>A standard generally is something set up and established by authority as a rule for the measure of quantity, weight, extent, value, or quality (Merriam-Webster 2009).</p>

One distinguishes private from public, vertical from horizontal, and, mandatory from voluntary standards.

Brunsson and Jacobsson (2000) describe standards in a broader sense: “*standards constitute rules about what those who adopt them should do*”.

The economic functions for standards can be the following:

- Facilitate coordination along the supply chain and hereby
- Enhance chain efficiency and
- Lower transaction costs (Will and Guenther 2007).

Third-country list Article 33(2), in Council Regulation (EC) No 834/2007, ‘Import of products providing equivalent guarantees’, refers to the list of countries “*whose system of production complies with principles and production rules equivalent to those laid down in Titles II, III and IV and whose control measures are of equivalent effectiveness to those laid down in Title V [...]. The assessment of equivalency shall take into account Codex Alimentarius guidelines CAC/GL 32*’. In short, this list contains the non-EU countries that have been recognised as having an equivalent organic regulation to the European regulation.

Traceability Following the definition of Regulation (EC) No 178/2002 on the general principles and requirements of food law, traceability is “*the ability to trace and follow a food, feed, food-producing animal or substance intended to be, or expected to be incorporated into a food or feed, through all stages of production, processing and distribution*”.

Vertical standard Vertical standard entails rules for a specified product or product group such as vegetables or wine (Will and Guenther 2007).

GLOSSARY PART B – ECONOMIC TERMS

Term	Definition / description
Administration costs	In the context of the CERTCOST project, this term sums up all costs of administration in terms of implementing an organic control system, be it of private or public ownership. These are the costs for administration, i.e. setting up, maintaining and changing this system. Thus, they are related to the governance structure of an organic control system. Depending on the responsibility, these costs occur as private (e.g. certification bodies' costs for auditing and accreditation) and public costs, the latter are defined as political transaction costs.
Assets Specificity	Uniqueness or inimitability of what is being exchanged among actors. Higher level of specificity implies higher transaction costs. Hypothetically, if the assets were not unique, the actors' capitals would be absolutely homogenous and actors would not establish any kind of permanent relationship or cooperation. Institutional Economics assumes that real-life transactions are always based on bounded rationality and potential opportunism of actors and also sometimes specificity of assets. All transactions are thus costly.
Bounded rationality	Behaviour that is intentionally rational, but only to a limited extent, because humans only dispose of limited capacities for collecting and processing information; hence fully rational decisions are not possible and uncertainty exists.
Business costs	Precisely which kind of costs organic operators incur for

of certification	inspection and certification procedures takes centre stage in CERTCOST. The term business costs of certification sums up the total burden of organic operators caused by certification requirements. This includes transaction costs in the form of cash-based costs and opportunity costs (See also the tables on p. 20 f.).
Cash-based costs	Cash-based costs are related to cash flow for a realized purchase. Since the purchase (exchange) of goods and services is directly linked to the corresponding expenditure, these costs can be precisely determined. Examples for cash-based costs related to organic control are: the control fee paid to the control body or expenditures for specific software.
Costs	<p>Very generally, costs are a foregone utility. More precisely, costs are the evaluated consumption and usage of economic goods of material or immaterial kind in monetary units (Dabbert and Braun 2006).</p> <p>In the CERTCOST project, the following cost terms are of specific relevance and explained in this glossary:</p> <ul style="list-style-type: none"> Cash-based costs Opportunity costs Transaction costs Administration costs
Credence goods	Customers buying a credence good have less information on the utility of this good than the seller; the given exchange is therefore conditioned by trust and its safeguarding entails relatively high transaction costs. The quality of these goods cannot be assessed by the consumer even after buying and consuming the good. See also " <i>Economics of information</i> ".
Economics of information	<p>Information is important when deciding between alternatives, e.g. to buy an organic tomato or not. The European consumer usually is informed on the price and the origin of a tomato, but does not know all details of the production process or the quality characteristic of a specific tomato. To acquire information on a good's characteristics as part of an exchange process (transaction) is costly.</p> <p>Economists categorise products according to the information costs on a good's attributes. Search characteristics, e.g. the colour of a tomato, can be checked easily and at correspondingly low cost before buying. Experience characteristics like the taste of the tomato can only be checked after buying. Even after the purchase, credence characteristics can only be checked at considerable cost, e.g. the origin of a tomato or its organic quality (Darby and Karni</p>

1973). Organic food products are credence goods.

Institution

Specific social structures that govern human acts and enable coordination of collective activities. Institution is the key term for the so-called Institutional Economics, which refers to institutions as rules that structure economic and social life.

The common perception of an institution is an organisation, but this is only one specific type of an institution (organisation is a more or less formalised entity). The term institution is hard to catch since many different things like the state, its constitution, a contract, matrimony and also the rules of a game are ranked among institutions - our world is full of institutions. The connection between different institutions is their governing character of social interaction, either of formal (e.g. a law or a contract) or informal kind (e.g. customs or unwritten rules of a group) (Göbel 2002).

We understand an institution as a system of norms comprising instruments of enforcement targeting to particular goals. This system intends to govern individual behaviour (Richter and Furubotn 2003). Market institutions, e.g. an organic standard, support market functions and hereby directly affect the level of transaction costs (McMillan 2008).

Managerial transaction costs

Transactions in terms of an exchange process do not only occur externally on the market, but also internally between departments and colleagues within a firm.

Managerial transaction costs are divided into

Costs of setting up, maintaining and changing the organisational structure (mostly fixed costs),

Costs of running the organisation (mostly variable costs) (Furubotn and Richter 2005).

Managerial transaction costs are part of the overhead costs, whose share is considerable. Miller and Vollmann (1985) refer to the 'hidden factory', which exists inside the firm next to manufacturing (therefore hidden) to point out the high importance of these costs.

Market transaction costs

Market transactions are exchange processes and involve costs – transaction costs. The costs for using the market generally can be divided into four categories (Furubotn and Richter 2005):

- 1) Search and information costs,
- 2) Bargaining and decision costs,
- 3) Supervision and enforcement costs

4) Investments in social relations, such as building trust¹⁶.

These costs occur when organic food products are exchanged on the market: First, the trading partners have to find each other and exchange information on the good, e.g. its quality, and the trading partner, e.g. its credibility or its solvency (1). If they want to trade on the available data, they have to negotiate the price and conditions of the exchange (2). After having concluded a contract, both partners will supervise, if the agreed conditions are kept and, if not, they will try to enforce their rights or the law (3). Finally, the costs (including the opportunity costs of the time spent) of establishing long term trade relations are relevant, since a relation of reciprocal trust can lower transaction costs considerably (4).

Although, organic certification is implemented in order to facilitate the existence of the organic market by lowering transaction costs of the exchange of a credence good, the certification system itself induces considerable costs, too.

Who bears transaction costs?

Market transaction costs usually are borne by all parties involved in a transaction. The distribution of these costs between the trade partners depends on the specific transaction (specific distribution of quality uncertainty and transaction specific investments related to the transaction). Due to the design of organic inspection and certification system, a considerable part of the overall transaction cost is on the side of the seller first. The seller will try to factor the costs of inspection and certification in the gross price.

Please confer to the tables in the Annex, where the different categories and forms of market transaction costs are illustrated in two examples of organic trade.

New Institutional Economics One of the theoretical strains of the Institutional Economics. It evolved during the 1960s and draws on historical 'old' school of Institutionalism. It acknowledges the importance of social institutions (such as property rights) for studying and explaining economic phenomena.

A distinguishing feature of the New Institutional Economics is its insistence on the idea that market processes, i.e. transactions, are costly. This is regarded as an approach to real life compared to other economic models, since searching information as well as processing this data takes time and resources (unlike Neoclassical Economics, where fully informed subjects are assumed) (Göbel 2002; Furubotn and

¹⁶ The term „investments in social relations“ can be seen as part of the broader concept of social capital as aggregate of interpersonal networks (Dasgupta 2008).

	Richter 2005).
Opportunism	<p>Model of mankind, which perceives that individuals are self-interested and likely to be dishonest. Opportunistic behaviour can e.g. be "<i>lying, stealing, cheating</i>" in order to be better off (Williamson 1985). Opportunism can be active or passive, and can occur ex ante or ex post transaction.</p> <p>It is assumed that any participant of the market (in order to be realistic) must take into account eventual opportunism of other partners. There is always a certain risk of opportunism present.</p>
Opportunity costs	<p>The economic concept of opportunity cost aims at quantifying a foregone alternative in monetary units. Usually, these costs are used as a medium of comparison, when deciding between alternatives.</p> <p>For the CERTCOST project, the concept of opportunity costs is of special importance for the monetary evaluation of operators' time spent on inspection and certification requirements.</p>
Political transaction costs	<p>Political transaction costs occur when setting up, maintaining and also changing the political and administrative system.</p> <p>First, this includes the government's costs for setting up the administrative structure and the judiciary. In the case of organic food, this is mainly the development and implementation of regulation (EEC) no. 834/2007. In this political process, parties, pressure groups and stakeholders are involved and incur costs. Hence, political transaction costs are not only borne by the public system but also by the private sector, e.g. in the form of lobbying costs.</p> <p>Second, running the polity (politically organised society), i.e. public administrative duties generate costs. These are mainly costs of operating and monitoring the certification system but also the running costs of the legal system.</p> <p>Political transaction costs can be considerable. Whereas the running costs can be estimated, e.g. by means of the Standard cost model, the former, the set-up costs are more difficult to approach.</p>
Quality	<p>The term quality, although often used, is a complex concept (Boekel 2005). Different disciplines have their specific understanding of what quality means. In economics, quality is defined as the sum of the attributes of a product, reflecting the different dimensions of quality, like in the case of food e.g. nutritional, sensory, ethical or organic quality. Different attributes are evaluated individually by different consumers, so, quality can either have an objective or a subjective aspect.</p>

Quality dimensions can be grouped as product quality, like food safety or food's nutritional quality on the one hand, and as process quality, like organic quality on the other hand, resulting from the production process (Northen 2000). Product attributes usually can be tested on the product, whereas process attributes need to be monitored during the production process, since they cannot be tested on the product itself. See also "*Economics of information*". Organic quality results from the production process. Thus, this specific quality cannot be tested on the product itself.

Risk (economic) Risk is one of the key determinants of many economic activities. Basically, risk can be defined as potential divergence from the expected result (Brandes et al. 1997). In the case of organic food products, consumers face the risk of buying a product labelled organic that does not fulfil the underlying standard, i.e. expected organic quality.

In economics, risk is often distinguished from uncertainty: In situations with risk, information on the *probability of occurrences* is available (derived from observed frequencies), whereas in situations involving uncertainty probabilities for different possible events do not exist.

CERTCOST tries to identify risks, i.e. objective probabilities based on existing data, which is connected to the characteristics of products or farmers in order to improve the targeting of organic inspections. This is known as risk based inspection.

Standard Cost Model (SCM) "*The Standard Cost Model is a method for determining the administrative burdens for businesses imposed by regulation*" (International Standard Cost Model Network 2005). In CERTCOST, this model and its methodology will be applied to quantify the monetary costs of the certification system.

Transaction A transaction is the exchange of goods or services, for example buying an organic tomato. When buying the tomato, this good is transferred from the seller to the buyer for an agreed price. In other words, the tomato is exchanged against a defined amount of money. A transaction is a basic unit of analysis in the Institutional Economics Theory.

Transaction costs The basic meaning of the term transaction is related to the exchange of a good or service between two parties. The idea that exchanging a good (service) is costly is pivotal for the concept of New Institutional Economics. The reasons for the existence of transaction costs are bounded rationality and opportunism sometimes along with asset specificity.

Transaction costs can be categorised as follows:

The cost of setting up, establishing, maintaining and

also changing this system - political transaction costs.

the costs of exchanging goods on the market, in other words the costs of using the market - market transaction costs;

Goods or services can also be exchanged within firms. Then we talk of intrafirm or managerial transaction costs.

Each category is illustrated in detail in this glossary.

Transaction costs in the above mentioned three types can occur as variable as well as fixed costs (Furubotn and Richter 2005). Variable transaction costs can depend on the number or the volume of transactions, while other transaction costs are fixed (i.e. independent from the number/volume of transactions), like e.g. enacting the organic regulation in terms of the specific investment for setting up institutional arrangements.

Following Williamson, transactions can be characterized by three critical features (Williamson 1979):

- 1) Uncertainty
- 2) Transaction frequency
- 3) Transaction specific investments (asset specificity)

These characteristics of transactions influence the amount of cost of a single transaction.

Trust

Specific type of a social relation that entails a confidence that a partner (person, organisation etc.) will meet certain expectations. Trust enables communication with fewer frictions. Trust among partners can be seen as a social structure that prevents opportunistic behaviour. Hereby, trust can reduce transaction costs.

REFERENCES

- Akerlof, G.A. (1970). *The Market for 'Lemons': Quality Uncertainty and the Market Mechanism*. Quarterly Journal of Economics, 84(3): 488-500.
- Becker, G.S. (1968). *Crime and Punishment: An Economic Approach* Journal of Political Economy, 76(2): 169-217.
- Boekel, M.A.J.S.v. (2005). Technological innovation in the food industry: product design. In: Innovation in agri-food systems. p.399, Ed. W. M. F. Jongen and M. T. G. Meulenberg. Wageningen: Wageningen Academic Publishers.
- Bonsi, R., A.L. Hammett and B. Smith (2008). *Eco-labels and International Trade: Problems and Solutions*. Journal of World Trade, 42(3): 407-432.
- Brandes, W., G. Recke and T. Berger (1997). Produktions- und Umweltökonomik. Stuttgart: Ulmer.
- Brunsson, N. and B. Jacobsson (2000). A world of standards. Oxford, New York: Oxford University Press.
- Caswell, J.A., M.E. Bredahl and N.H. Hooker (1998). *How Quality Management Metasystems Are Affecting the Food Industry*. Review of Agricultural Economics, 20(2): 547-557.
- Codex Alimentarius Commission (1995). Principles for Food Import and Export Certification and Inspection. Rome: Food and Agriculture Organization of the United Nations, World Health Organization.
- Codex Alimentarius Commission (2007a). Organically Produced Foods. Rome: Food and Agriculture Organization of the United Nations, World Health Organization.
- Codex Alimentarius Commission (2007b). Procedural Manual. Rome: Food and Agriculture Organization of the United Nations, World Health Organization.
- Commission of the European Communities (2009). Communication from the Commission to the European Parliament, the Council, the European Economic

References

- and Social Committee and the Committee of the Regions on agricultural product quality policy (COM(2009) 234 final). Brussels
- Dabbert, S. and J. Braun (2006). *Landwirtschaftliche Betriebslehre*. Stuttgart: Ulmer.
- Dabbert, S., A.M. Häring and R. Zanolì (2004). *Organic Farming: Policies and Prospects*. London, New York: Zed Books Ltd.
- Dankers, C. and P. Liu (2003). *Environmental and social standards, certification and labelling for cash crops*. Rome: FAO.
- Darby, M.R. and E. Karni (1973). *Free competition and the optimal amount of fraud*. *The Journal of Law and Economics*, 16(1): 67-88.
- Dasgupta, P. (2008). Social Capital. In: *The New Palgrave Dictionary of Economics*. Ed. S. N. Durlauf and L. E. Blume. Basingstoke: Palgrave Macmillan.
- EC (1991). Council Regulation (EEC) No 2092/91 on organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs. Official Journal L 198, 22.7.1991, 24 June 1991.
- EC (2007). Council Regulation (EC) No 834/2007 on organic production and labelling of organic products and repealing Regulation (EEC) No 2092/91. Official Journal of the European Union L 189/1, 28 June 2007
- Eide, E. (2000). Economics of Criminal Behavior. In: *Encyclopedia of law and economics*. Volume 5. The economics of crime and litigation. p.345-389, Ed. B. Bouckaert and G. De Geest: Cheltenham, U.K. and Northampton, Mass. Elgar; distributed by American International Distribution Corporation, Williston, Vt.
- European Union (2009). List of Bodies or Public Authorities in Charge of Inspection Provided for in Article 15 of Regulation (EEC) No 2092/91. 2009/C 72/04, 26.3.2009.
- Furubotn, E.G. and R. Richter (2005). *Institutions and economic theory: the contribution of the New Institutional Economics*. Ann Arbor: University of Michigan Press.
- Gesellschaft für Ressourcenschutz (GfRS) (2003). *Analyse der Schwachstellen in der Kontrolle nach EU-Verordnung 2092/91 und Erarbeitung von Vorschlägen zur Weiterentwicklung der Kontroll- und Zertifizierungssysteme im Bereich des Ökologischen Landbaus*. Göttingen: GfRS.
- Giannakas, K. (2002). *Information Asymmetries and Consumption Decisions in Organic Food Product Markets*. *Canadian Journal of Agricultural Economics*, 50(1): 35-50.
- Göbel, E. (2002). *Neue Institutionenökonomik*. Stuttgart: Lucius und Lucius.
- Golan, E., F. Kuchler, L. Mitchell and w.c.b.C.G.a.A. Jessup (2001). *Economics of Food Labelling*. *Journal of Consumer Policy*, 24(2): 117-184.
- International Standard Cost Model Network (2005) *International Standard Cost Model Manual*. http://www.administrative-burdens.com/filesystem/2005/11/international_scm_manual_final_178.doc, accessed 12.08.2008.

References

- International Task Force (ITF) (2007). Harmonization and Equivalence in Organic Agriculture: United Nations Conference on Trade and Development (UNCTAD), Food and Agriculture Organization of the United Nations (FAO), International Federation of Organic Agriculture Movements (IFOAM).
- Koesling, M., A.-K. Løes, O. Flaten and G. Lien (2008). Dropping organic certification - effects on organic farming in Norway. *Second Scientific Conference of the International Society of Organic Agriculture Research (ISO FAR), held at the 16th IFOAM Organic World Congress in Cooperation with the International Federation of Organic Agriculture Movements (IFOAM) and the Consorzio ModenaBio, 18 – 20 June 2008, Modena/Italy*. ISO FAR: 378-381.
- Kontogeorgos, A. and A. Semos (2008). *Marketing aspects of quality assurance systems - The organic food sector case*. British Food Journal, 110(8): 829-839.
- Krieger, S., G. Schiefer and C.A. Da Silva (2007). Costs and benefits in food quality system: concepts and a multi-criteria evaluation approach. Rome: FAO
- Lampkin, N., C. Foster, S. Padel and P. Midmore (1999). The Policy and Regulatory Environment for Organic farming in Europe. Stuttgart-Hohenheim: Universität Hohenheim.
- Lippert, C. (2005). Institutionenökonomische Analyse von Umwelt- und Qualitätsproblemen des Agrar- und Ernährungssektors. Kiel: Vauk.
- Lippert, C., A. Zorn, T. Schulz and S. Dabbert (2009). Zur Ökonomik von Kontrollmaßnahmen im ökologischen Landbau. *10. Wissenschaftstagung Ökologischer Landbau*, Zürich. Dr. Köster: 268-271.
- 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.
- McMillan, J. (2008). Market institutions. In: *The New Palgrave Dictionary of Economics* Ed. S. N. Durlauf and L. E. Blume. Basingstoke: Palgrave Macmillan.
- Merriam-Webster (2009). Merriam-Webster OnLine. Springfield, Merriam-Webster.
- Miller, J.G. and T.E. Vollmann (1985). *The hidden factory*. Harvard Business Review, 63(5): 142-150.
- Mora, C. and D. Menozzi (2005). Company costs and benefits of organic processed food. EAAE 92nd seminar on Quality Management and Quality - Assurance in Food Chains. European Association of Agricultural Economists. Göttingen, EAAE.
- Nelson, P. (1970). *Information and Consumer Behavior*. Journal of Political Economy, 78(2): 311-329.
- North, D.C. (1990). Institutions, Institutional Change and Economic Performance. Cambridge: Cambridge University Press.
- Northern, J.R. (2000). *Quality attributes and quality cues*. British Food Journal, 102(3): 230-245.

References

- Richter, R. and E.G. Furubotn (2003). *Neue Institutionenökonomik: Eine Einführung und kritische Würdigung*. Tübingen: Mohr Siebeck.
- Rundgren, G. (2001). *What cost is organic certification?* *The Organic Standard*, (7): 7-12.
- Rundgren, G. (2002). *History of organic certification - from ideology to standards*. *The Organic Standard*, (14): n/a.
- Rundgren, G. (2007). *Building Trust in Organic*. Bonn: IFOAM.
- Rundgren, G. (Ed.) (2008). *The Organic Certification Directory 2008*. Höje: Grolink.
- Santacoloma, P. (Ed.) (2007a). *Certification costs and managerial skills under different organic certification schemes - Selected Case Studies*. *Agricultural Management, Marketing and Finance - Working document 14*. Rome: FAO.
- Santacoloma, P. (2007b). *Organic certification schemes: managerial skills and associated costs*. Synthesis report from case studies in the rice and vegetable sectors. FAO. Rome, FAO.
- Scheerer, S., P. Kerschke-Risch and G. Meinecke (2007). *Eine kriminologische Analyse des Entscheidungsverhaltens in den Wertschöpfungsketten „konventionelles Geflügel und Öko-Geflügel“*. Hamburg: Universität Hamburg, Fakultät Wirtschafts- und Sozialwissenschaften.
- Schmid, J. (2005). *Der Ausstieg aus dem Biolandbau in Österreich - Ergebnisse einer Befragung*. Department für Wirtschafts- und Sozialwissenschaften, Institut für Agrar- und Forstökonomie. Wien, Universität für Bodenkultur.
- Schmid, O. (2007). *Development of Standards for Organic Farming*. In: *Organic farming: an international history*. p.152-174, Ed. W. Lockeretz. Wallingford, Cambridge: CABI.
- Schröder, M.J.A. (2003). *Food Quality and Consumer Value. Delivering Food that Satisfies*. Berlin, Heidelberg, New York: Springer-Verlag.
- Simon, H.A. (2008). *Rationality, Bounded*. In: *The New Palgrave Dictionary of Economics*. Ed. Basingstoke: Palgrave Macmillan.
- Stigler, G.J. (1970). *The Optimum Enforcement of Laws*. *Journal of Political Economy*, 78(3): 526-536.
- United States Department of Agriculture - Agricultural Marketing Service (2000). *National Organic Program, Final Rule, 21 December 2000*.
- United States Department of Agriculture - Agricultural Marketing Service. (2008). *National Organic Program*. Retrieved 27.10.2008, from <http://ecfr.gpoaccess.gov>.
- Vogt, G. (2001). *Ökologischer Landbau zwischen sich wandelnden Leitbildern und erstarrten Richtlinien. Beiträge zur 6. Wissenschaftstagung zum Ökologischen Landbau*, Berlin. Dr. Köster: 35-38.
- Will, M. and D. Guenther (2007). *Food Quality and Safety Standards*. Eschborn: Deutsche Gesellschaft fuer Technische Zusammenarbeit (GTZ) GmbH.

References

- Williamson, O.E. (1979). *Transaction-Cost Economics: The Governance of Contractual Relations*. Journal of Law and Economics, 22(2): 233-261.
- Williamson, O.E. (1985). *The economic institutions of capitalism: firms, markets, relational contracting*. New York: Free Press.
- ZMP (Ed.) (2008). *Materialien zur Marktberichterstattung (Band 77): Ökomarkt Jahrbuch 2008– Verkaufspreise im ökologischen Landbau*. Bonn: ZMP Zentrale Markt- und Preisberichtsstelle.
- Zorn, A. (2008). Organic farming certification – the costs of reducing transaction costs. *Jahrestagung der Österreichischen Gesellschaft für Agrarökonomie (ÖGA) "Neue Impulse in der Agrar- und Ernährungswirtschaft?!", 18.-19. September 2008, Tagungsband, Wien*. ÖGA: 79-80.
- Zorn, A. and H. Renner (2008). Organic operators' satisfaction with their certification body – a survey in Germany. *Second Scientific Conference of the International Society of Organic Agriculture Research (ISO FAR), held at the 16th IFOAM Organic World Congress in Cooperation with the International Federation of Organic Agriculture Movements (IFOAM) and the Consorzio ModenaBio, 18 – 20 June 2008, Modena/Italy*. ISO FAR: 386-389.