



**ECONOMIC ANALYSIS OF CERTIFICATION
SYSTEMS IN ORGANIC FOOD AND
FARMING:
SYNTHESIS REPORT OF RESULTS
D 23**

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Stephan Dabbert, Canan Abay, Samanta Rosi Bellière, Murat Boyaci, Antonio Compagnoni, Iris Förster, Danilo Gambelli, Ulrich Hamm, Michael Hartmann, Beate Huber, Meike Janssen, Lizzie Melby Jespersen, Christian Lippert, Heidrun Moschitz, Lorenzo Paluan, Lorenzo Peris, Bülent Miran, Florentine Meinshausen, Susanne Padel, Alessandro Pulga, Elisabeth Rüegg, Francesco Solfanelli, Matthias Stolze, Özlem Karahan Uysal, Jane Vine, Raffaele Zanolli, Alexander Zorn



This is a synthesis report that gives an overview on the results of the CERTCOST project. There is a companion report (Dabbert 2011, D24) which provides recommendations from the project on how to improve the organic certification system.

The target group of this report is stakeholders in the organic certification system. We have thus concentrated on results, being short on methodology, which is documented elsewhere. This is not an original scientific report. In the interest of readability we freely make use of sentences, paragraphs and text passages of the published CERTCOST project reports, without exact quotations. With respect to all other quotations we have adhered to the usual scientific practice of referencing.

DISCLAIMER

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List of abbreviations

BN	Bayesian belief networks
CA	Control Authority
CB	Control Body
CH	Switzerland
CZ.....	Czech Republic
DE	Germany
DK	Denmark
IT	Italy
NC	non-compliance
TR.....	Turkey
UK	United Kingdom

1 INTRODUCTION

The objective of this report is to provide an overview on what is known about the organic certification sector in Europe seen from an economic viewpoint. The results presented here are based on the different work packages of the CERTCOST project. The CERTCOST project represents a major effort of 11 European institutions (see Table 1) from seven European countries. The project consortium consisted out of universities, research centres as well as control bodies involved in organic certification. The project was a major effort to produce an overview and an economic analysis of the certification system for organic food and farming in Europe. Equal importance was given to produce sound scientific results and at the same time to involve relevant stakeholders within the project discussions and inform them on the results.

In this report we present selected important results of the work which we think are of interest to a diversity of stakeholders connected with the organic certification system. We keep methodological considerations short because these are mostly of lesser interest to stakeholders. Of course methodological issues have been documented in detail in the project reports and a number of scientific papers. Further details on these can be found at the project website at www.certcost.org.

This synthesis report aims to give an overview on the work done in the CERTCOST project. It is not an original scientific report. We freely make use of sentences, paragraphs and text passages of the published CERTCOST project reports. In some cases these texts are directly used, in many instances they have been revised and adapted to serve the purpose of this report here. For reasons of readability we have abstained from referencing these texts and these changes in detail. We refer to the project reports from which the information comes by footnotes at the beginning of the respective Section. With respect to all other citations (not coming from project reports but from papers or any publication from outside the project) we have adhered to the

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usual scientific practice of referencing. We think that this procedure is in the interest of the reader of this report.

There is a companion report which provides recommendations from the project on how to improve the organic certification system (Dabbert, 2011). Because there is a full report drawing recommendations from the project results, we concentrate on the facts in this synthesis report and do not draw recommendations from the findings presented.

This synthesis report begins with some baseline information on the organic certification sector in Europe (Chapter 2). This information is useful as a background to more in depth analysis in the later Chapters. In Chapter 3 an analysis of the costs of the certification system is presented. The ultimate objective of organic certification is to guarantee the integrity of the organic product to the consumer. Thus Chapter 4 turns to the consumer side and analyses different aspects of the organic certification system from the consumer perspective. Specifically, consumer response to different organic certification logos is analysed in detail. In Chapter 5 we analyse the factors influencing the risk of non-compliance with the organic standards using data from control bodies and control authorities from several countries. In addition results of a modelling approach are presented that helps to consider how to optimally choose inspection rates and other important characteristics to improve certification systems.

Table 1: Participants in the CERTCOST project

University of Hohenheim	Germany (DE)
Research Institute of Organic Agriculture (FiBL)	Switzerland (CH)
Polytechnic University of Marche	Italy (IT)
University of Kassel	Germany (DE)
Institute for Marketecology (IMO)	Switzerland (CH)
Ege University	Turkey (TR)
International Centre for Research in Organic Food Systems (ICROFS), University of Aarhus	Denmark (DK)
Czech University of Life Sciences	Czech Republic (CZ)
Institute for Ethical and Environmental Certification (ICEA)	Italy (IT)
University of Aberystwyth	United Kingdom (UK)
Organic Research Centre	United Kingdom (UK)

2 BASELINE INFORMATION

In this Chapter we present some information on the regulatory framework in the EU that governs organic certification. We then describe the organic certification system in Europe and give some facts on the study countries. A brief overview on publicly available prices for organic certification follows. In some countries public support measures for organic certification exist. These are subsequently discussed. Finally we give an estimate of the size of the organic certification sector in the EU in terms of full-time equivalents of people working in the sector.

2.1 The regulatory framework in the EU¹

Quality assurance is of key importance for the future development of the Common Agricultural Policy of the EU. A large number of mandatory and voluntary assurance schemes exist for agriculture and in the food industry. Food quality assurance and certification schemes involve the setting of requirements, bodies that undertake control or provide certificates, and communication with consumers.

Requirements can be divided into

- statutory regulations regarding food safety and good agricultural practice and
- standard setting rules for voluntary attributes.

Basic requirements in relation to food safety, animal health and animal welfare are overseen by national Official Food and Feed Control systems according to

¹ This Section is an updated and revised version of the executive summary (p 3 and 4) from Padel (2010).

Regulation (EC/882/2004). Third party certification by private control bodies or public control authorities provides credibility to quality claims related to voluntary standards or EU regulations and is communicated to the consumers through the use of certification logos. The EU has also developed a legislative basis for quality claims in relation to geographical indications (Council Regulation (EC) 510/2006), traditional specialities (Council Regulation (EC) 509/2006) and organic farming and considers introducing labelling rules in relation to animal welfare, environmental impact and the origin of raw materials. A high number of private and public food quality schemes potentially lead to increased costs for producers and confusion of the consumers.

The development of organic standards and certification in Europe started with private standards and national rules, leading to Regulation (EEC) 2092/1991. Weaknesses of the organic certification under that regulation that have been discussed publicly relate to a low level of knowledge among consumers of the requirements of organic certification, a weak emphasis of the control system on operator responsibility for organic integrity, issues of competition among and surveillance of control bodies, a lack of consideration of risk factors in designing the inspection systems and lack of transparency.

A total revision of the European Regulations on organic production began in 2005. One important change introduced by the new Council Regulation (EC) 834/2007 for Organic Food and Farming is that the organic control system is placed under umbrella of Council Regulation (EC) 882/2004 on Official Food and Feed Controls. Regulation (EC) 834/2007 also requires that control bodies have to be accredited according to general requirements for bodies operating product certification systems (ISO Guide 65 or EN 45011, (Cen, 1998)). Since July 2010 prepackaged organic products have to carry the new EU logo as well as the compulsory registration number of the control body. It is still not completely clear what the impact of the Council Regulation (EC) 882/2004 on the organic control system is.

A number of international initiatives concerned with the harmonisation of organic standards and certification exist, such as the International Task Force on Harmonisation and Equivalence (ITF)², the European Organic Certifiers Council (EOCC), the International Social and Environmental Accreditation and Labelling Alliance (ISEAL) and the Anti-Fraud Initiative (AFI). The multilateral initiatives have led to a better understanding of current problems and the scope and limitations for harmonisation, the sharing of tools and methods and have contributed to the identification of best practice.

Besides the present EU certification system two main alternative guarantee systems for organic production have been developed and researched by a number of organisations including IFOAM, ISEAL, FAO and the EU Commission:

- Smallholder Group Certification based on an Internal Control System (ICS) and
- Participatory Guarantee Systems (PGS).

These two systems could represent ways to minimize certification costs also for European farmers, especially for operators that market their products directly to

² *The Task Force finished its work in 2008. The extension of the work is the Global Organic Market Access (GOMA) project which seeks to simplify the process for trade flow of organic products among various regulatory and/or private organic guarantee systems. GOMA focuses on harmonization and equivalence.*

consumers or through very short supply chains: These two alternatives illustrate examples of certification systems aimed at improving the present organic certifications systems in the EU.

2.2 The European organic certification system and information about the study countries³

The study countries were selected to represent different certification systems. Three types of certification systems are distinguished (Notices from Member States, 2009):

- A: System of approved private inspection bodies
- B: System of (a) designated public inspection authority(ies).
- C: System of a designated public inspection authority and approved private inspection bodies.

In 2007 (when the application for the CERTCOST project was written) the countries selected for the study represented all three types of certification systems (Notices from member states, 2007).

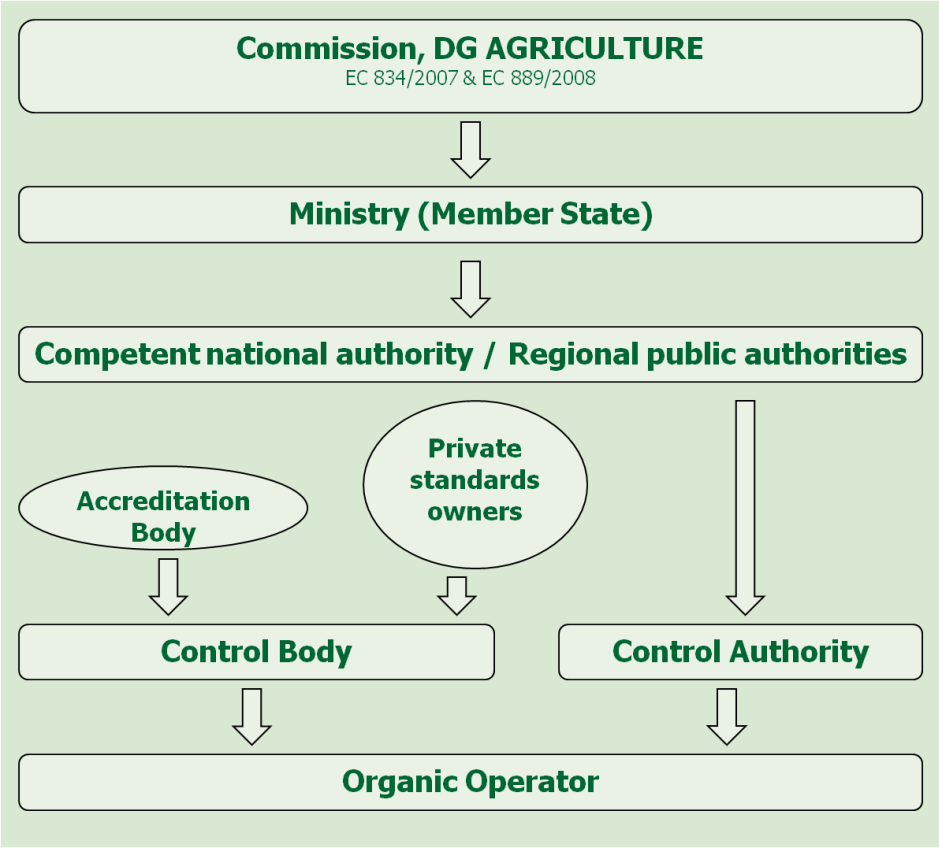
Three EU countries, Germany, Italy and the United Kingdom plus the two countries outside the EU, Switzerland and Turkey, had the type A certification system, while Denmark had a type B and the Czech Republic a type C system. However, in 2008 the Czech Republic changed its certification system to type A.

At the EU level the organic certification system is supervised by the European Commission and at the national level by the Member States. Supervision is especially required for countries that adopt systems A and C, where private inspection bodies can compete for clients. To guarantee an equal minimum level of control intensity in a competitive market environment, supervision of private inspection bodies is necessary (Zorn et al., 2012). The data used for supervision suffers from insufficient quality partly resulting from missing definitions of important terms. Therefore, the usability of the supervision reports up to now is limited (European Commission, n. d.; Zorn et al., 2012).

Figure 1 gives a schematic overview on the institutions involved in the organic certification system.

³ This Section uses text from Jespersen (2011).

Figure 1: Institutions involved in organic certification according to the European organic standard



Source: Zorn et al. (2009), adapted from Zorn et al. (2009)

Table 2 shows an overview of the number of actors involved in the certification chain for the 7 study countries in the year 2008.

Not all countries are represented at all levels. In some countries the supervision of the organic certification system lies with regional or provincial governments. This is the case in Germany and Italy. In Denmark the supervision of the organic certification system has been delegated to two governmental agencies.

Accreditation bodies are not involved in the certification chain in all of the study countries because the EC 834/2007 does not require that public control authorities are accredited according to ISO65 / EN45011. This is the reason why there is no accreditation body in Denmark, listed in Table 2.

In the Czech Republic no standards owners are involved, because the control bodies certify according to the organic EU regulations only. Standards owners may be public authorities (standards for areas not covered by the EU organic regulations, as for example catering in Denmark) or private bodies, e.g. Demeter, Bioland, AIAB and the Soil Association (in Germany, Italy and the United Kingdom), while the countries outside the EU (Switzerland and Turkey) apply their own governmental regulation as well as private standards (in Switzerland).

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Table 2: Overview of the actors involved in the organic certification chain in the 7 study countries for the year 2008

	Competent Authorities	Accreditation Bodies	Control Authorities	Control Bodies	Standards Owners	TOTAL	Authorities subsidizing certification costs
CZ	1	1	-	3	-	5	
DE	15	2	-	22	9	48	11
DK	2	-	2	1	3	8	1
IT	1 (24) ¹	1	-	18	4	24	19
UK	1	1	-	9	1	12	1
CH	1	1	-	4	4	10	-
TR	1	1	-	10	1	13	-
Total	22	7	2	67	22	120	34

¹ The Italian Ministry of Agriculture and Forestry has delegated the supervision of the private control bodies to the Central Inspectorate for the Control of Food Quality (ICQ) and to 20 regional and 2 autonomous provincial governments. Source: Organic Rules and Certification (2011)

Table 3 presents an overview of the most important statistical data from 2007-2008 on organic farming area and operators for the seven selected countries. This includes information on total agricultural area, organic area, in conversion area and the organic area in percent of the total agricultural area. Data on total number of farmers, certified organic operators, organic farmers, other organic operators than farmers and organic farmers in percent of total farmers is also included. Switzerland has the highest percentage of organic area (11.2 %) and organic farmers (10 %) of all seven countries, while the Czech Republic has the highest percentage of organic area (8 %) and Denmark has the highest percentage of organic farmers (6.2 %) within the selected EU countries.

Table 3: Statistic information on organic area and operators in the 7 study countries

Country	Unit	CZ	DE	DK	IT	UK	CH	TR
Country area ¹	km ²	78,866	356,854	43,094	301,263	244,820	41,290	783,562
Agricultural area ¹	ha	4,249,177	16,931,900	2,662,590	12,707,850	17,452,100	1,047,384	24,479,216
Certified organic + in conversion area ²	ha	341,632	907,786	150,374	1,002,414	737,631	117,286	109,387
Certified organic area ³	ha	232,939	-	139,021	812,139	582,205	-	-
Area in conversion to organic	ha	108,693	-	11,353	190,275	155,426	-	-
Agricultural area in % of country area ²	%	54	47	62	42	71	25	31
Certified organic + in conversion area in % of agricultural area	%	8.0	5.4	5.6	7.9	4.2	11.2	0.4
Farmers (conventional + organic) ⁴		39,396	370,480	44,620	1,679,440	299,830	60,857	3,076,649
Certified organic operators ⁵		2,585	29,244	3,794	49,653	7,896	-	15,918
certified organic farmers ⁵		1,946	19,813	2,751	42,037	5,177	6,111	15,406
Other organic operators than farmers ⁵		639	9,431	1,043	7,616	2,719	-	512
Certified organic farmers in % of total farmers	%	4.9	5.3	6.2	2.5	1.7	10.0	0.5

¹ 2007 data from www.organicrules.org database (no data were available for 2008).

² 2008 data from www.organic-world.net, as of November 2010.

³ 2008 data from EUROSTAT: "Organic Crop Area", as of November 2010.

⁴ 2007 data from EUROSTAT: "Number of agricultural holdings", as of November 2010.

⁵ 2008 from CERTCOST Questionnaire investigation.

2.3 Recent changes in the EU import regulation⁴

With the new Council Regulation (EC) No 834/2007 and the provisions concerning the arrangements for imports from third countries (Regulation EC No 1235/2008) approved in December 2008, the conditions for imports from third countries have changed considerably.

The European Commission states that the purpose of the new import regime is wider than simply the prevention of fraud. It aims at simplifying processes and procedures,

⁴ This Section uses text from Abay et al. (2011).

to reduce the burden on operators, to improve transparency and at the same time to contribute to international harmonization.

In the long run there will be two options for importing organic products from third countries to the EU:

1. Production standards and control measures of the EU Regulations on Organic Agriculture are applied in the third country exactly as in the EU member states, i.e. the products produced in the third country are “**compliant**” with the EU organic regulations. In co-operation with the EU member states, the European Commission will establish a list of recognized “compliant” control bodies and control authorities authorised to carry out inspections and issue organic certificates in the third countries.
2. The third country applies production standards and control measures that are equivalent to the EU Regulation on Organic Agriculture, thereby producing “**equivalent**” organic food products. In this case, the EU recognition can be obtained when either
 - the third country in question has been included in the European Commission’s list of recognised third countries, or
 - the control body or control authority operating in the third country has been included by the European Commission in its list of “equivalent” control bodies and control authorities.

During a transitional phase a third option is possible using the system of “import authorisation” which was part of the import system under the previous legal framework. The operators (e.g. farmers, processors) in the third country apply organic production standards and control measures equivalent to the EU Regulation on Organic Agriculture, and the competent authority of the Member State, where the importer has notified its activity grants an import authorisation to the EU importer. These authorisations may be granted by an EU Member State until 12 months after the Commission publishes the first list of control bodies recognised as being “equivalent”. The import authorisations by the competent authorities of EU Member States are valid for up to 24 months after the publication of the list of “equivalent” control bodies and authorities of third countries.

Although the new rules already are legally in force in practice there have not been any changes in the applied import procedures until mid-2011 when this report was written. The system of import authorisations will be phased out between 2011 and 2013. From the first of January 2013 onwards, EU Member States will be no longer allowed to issue import authorisations.

The list of recognised third countries (Argentina, Australia, Costa Rica, India, Israel, Japan, New Zealand and Switzerland) has been transferred to the new regulation and remains valid. Meanwhile the list has been amended to include Tunisia⁵ and

⁵ *Commission Regulation (EC) No 537/2009 of 19 June 2009 amending Regulation (EC) No 1235/2008, as regards the list of third countries from which certain agricultural products obtained by organic production must originate to be marketed within the Community*

Canada⁶. Thus the part of the “equivalency option” that already existed under the past remains in principle unchanged in force under the new regulation.

The implementation of the second part of the “equivalency option” is still work in progress. The procedure for recognition of control bodies and authorities operating in third countries has been initiated in 2009 by the European Commission. October, 31st 2009 was the first deadline for submitting applications for approval of certification bodies operating outside the EU. 72 certification bodies from within and outside the EU have submitted their applications. The rounds of requests for inclusion to the list of approved control bodies and authorities will be made by October, 31st each year. In October 2011 the EU Standing Committee on organic farming “voted to accept the procedures and a list of approved certification bodies” (Mattson, 2011:1). 30 control bodies are thus on the equivalency list. The “new system will enter into force on July 2012” (Mattson, 2011:1).

The procedure for approving control bodies and authorities with a compliant control system (point by point implementation of the EU Regulations on Organic Agriculture) has been postponed. The Commission anticipates an exhaustive evaluation process to assess compliance with the organic EU Regulation. This is to prevent distortions in market competition that would endanger the competitiveness of European organic producers and to ensure consumer protection. The first application deadline for inclusion has originally been determined for October 2011, however with Regulation (EU) 590/2011 it has been expanded until October 2014.

2.4 Publicly available prices for organic certification⁷

Transparency and the possibility to compare control fees of different control bodies within countries as well as between countries are important for the organic operators (farmers, processors, importers etc.). Such transparency is particularly relevant in countries where there are many control bodies to choose among, as for example in DE, IT, the UK and TR. In the seven study countries the percentage of control bodies, which did have public price lists on their web site, varied considerably. In CZ it was 67 % (2 out of 3), in CH: 50 % (2 out of 4), in IT and the UK: 44 % (IT: 8 out of 18, UK: 4 out of 9), in TR: 20 % (2 out of 10) and in DE: 14 % (3 out of 22). DK has a governmental certification system free of charge for all organic operators, for which reason there is no price list.

Control fees are calculated in many different ways by the different control bodies, making it difficult for the customers to estimate and compare prices. For comparison of the fees, 3 typical farm cases: a 50 ha arable farm (cereals) without animals, a 50 ha dairy farm with 50 dairy cows and 10 ha arable crops and a 10 ha vegetable farm and 2 processor cases: an oil mill (olives, rapeseed or other with 100 % organic processing and 100.000 t raw material processed per year), and a flour mill (10 % organic processing and a total of 100.000 t flour produced per year), were used.

⁶ *Commission Implementing Regulation (EU) No 590/2011 of 20 June 2011 amending Regulation (EC) No 1235/2008, laying down detailed rules for implementation of Council Regulation (EC) No 834/2007 as regards the arrangements for imports of organic products from third countries*

⁷ *This Section uses text from Jespersen (2011).*

Each control body was asked to provide data on how many hours they would spend on the control of these cases and the fee they would charge for the control including necessary homework connected to the control. This made it possible to compare minimum, maximum and average fees and hours spent on the control between the countries (CZ, DE, IT, UK, CH)⁸. These data are based on 25 responses from control bodies from the countries mentioned.

The comparison showed that the variation in the size of the fee, the hours spent and the hourly rate could vary as much as or even more between control bodies within the same country as between countries. The size of the fee and the time spent on the control were not necessarily related. In general the CBs in CZ had the lowest average fees – for the farm cases: 66-109 €, followed by the CBs in IT (262-375 €), DE (350-420 €), UK (526-571 €), and CH (811-1003 €). For the processor cases the order of the countries as concerns fee size was the same.

2.5 Public support measures influencing certification costs⁹

Public support schemes for organic certification were also investigated. In four countries, CH, CZ, TR and the UK there is no support for payment of the organic inspection and certification costs except for the British region, Scotland, which may support farmers up to a set limit of 188 €. In DK the control system is public and free of charge for the organic farmers as well as for the processors. In DE in 11 out of 16 *Länder* and in IT 18 out of 19 regions and one out of two provinces the control costs of organic farmers are subsidised by the regional governments at different levels and periods. Farmers may get a subsidy that partly reduces their control fee or is even fully equivalent to the size of the fee, depending on the size of the fee they have to pay. Subsidy schemes for the costs of participation in the EU food quality schemes can be co-financed by the European Union as part of the Rural Development Programs.

The five German *Länder* involved in the study paid a support of 35 €/ha up to a maximum of 15 ha or 530 € (2009), which is enough to cover all or most of the control fee in the three farm cases investigated, depending on the control body having carried out the control. Of the two Italian regions involved in the study, Marche had no support scheme, while Tuscany in 2009 paid the actual documented control cost up to 3,000 € per farm and year for a five year period.

⁸ TR was also included as a case study in data collection. The results are not reported here because they do not seem to be reliable.

⁹ This Section uses text from Jespersen (2011).

2.6 Estimate of the size of the organic certification sector in selected EU and associated countries¹⁰

An attempt was made to give an estimate of the size of the organic certification sector in the EU (competent authorities, accreditation bodies, control authorities, control bodies and standards owners) expressed in staff full time years.

Based on information supplied by ten competent authorities, three accreditation bodies and 18 control bodies in the five EU countries investigated, it was estimated that about 1500 staff full time years (a unit making labour of all staff working in the sector comparable, even if they work part time) were spent by competent authorities, accreditation bodies, control authorities and control bodies on organic control in the 27 EU countries in 2008. The actual figure may be higher, because the workforce of the accreditation bodies, control bodies and standards owners involved in accreditation and control according to private standards and standards outside the EU were not included, and work spent on import and export control was not included either, because no data was available on this aspect.

With 1500 employees the annual cost of the workforce of the organic certification sector was estimated to about 35-55 million €. Apart from staff wages, there are other fixed and variable costs plus overhead, which means that the annual turnover of the competent authorities, accreditation bodies, control authorities and control bodies in the EU-27 was probably at least around 70-110 million € in 2008. Organic market size was estimated to be worth 18 billion € (Willer und Kilcher, 2010:141), so this would be 0.5 % of the retail sales value. This estimate is about half of that made earlier by Zorn et al. (2009), which was based on less reliable data.

In CH the 46 staff full time years in the organic certification sector corresponded to at least two million € in 2008 as salary cost, and the annual turnover of the organic certification sector was probably at least four million €. In TR the 35 staff full time years corresponded to at least 350,000 € in 2008, and the annual turnover of the organic certification chain was probably at least 700,000 €.

¹⁰ This Section uses text from Jespersen (2011).

3 ANALYSING THE COST OF THE SYSTEM AND LEARNING FROM ALTERNATIVE SYSTEMS

This Section reports on the costs of the organic certification system in force in CH, CZ, DE, DK, IT and the UK. It gives a brief overview of the alternative systems analysed in order to find possibilities to improve the organic certification system.

3.1 Costs of certification¹¹

Operator level

The cost of certification for the operator has two important components:

- The fee that needs to be paid to the control body and
- the effort (time and money) connected to documentation of practices relevant for the organic standard, preparing the control visit and the control visit itself and possibly a follow-up visit.

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 or in private organic standards (e.g. Bio Suisse in CH or Soil Association in the UK). Costs which are not directly associated with expenditure (opportunity costs) are caused by working time needed for information search, time spent on control visits and their preparation or time required derogation

¹¹ This Section uses text from Stolze et al. (2011).

requests (Zorn et al., 2009). Some of these costs can be exclusively assigned to the fact that an operator is following organic standards (e.g. time spent on organic control visits) others (e.g. documentation of incoming goods) would also be carried out on a conventional farm (Zorn et al., 2009). Very limited information exists on those opportunity costs for organic certification. The figures presented in the following are based on hours needed for these tasks which were valued at relevant hourly rates. These costs are termed opportunity costs subsequently – as they represent the value of the time that could be used for other purposes.

The challenge of analysing operators' costs of organic certification is that much of the data needed is not readily available in the required quality and degree of detail. Research presented in this Section therefore is based on two different data sources:

- Electronic control reports from the year 2008 retrieved from private control bodies and control authorities representing the control system as foreseen in Council Regulation (EC) No 834/2007 (private control bodies in CZ, DE, IT; public control authorities in DK) and from two control bodies representing private organic standards (CH and UK). These control reports contained structural information about all the organic operators certified by the control bodies as well as information about the duration of the control visits and the inspection fee.
- A survey of 526 organic farmers and 131 organic processors from CH, CZ, DE, DK, IT and the UK supplements the electronic control reports for a subset of operators in each country. The survey was used to collect information about the tasks involved in preparing the control and certification, such as the time spent for informing oneself about possible changes in the standards, asking for special derogations or preparing of all the required documents.

The analysis showed that for the organic farmers the median¹² of the inspection fee in all study countries amounts to around 500 Euro per farm. Lower fees were identified in CZ control data whereas in the UK, the median inspection fee amounts to more than 600 Euro (see Table 4). According to the control reports analysed, the median inspection duration was approximately three hours per farm in CH and CZ. Again, the UK control reports show longer inspection duration (4.5 hours) and for DE a lower (2.0 hours) duration of inspection was found. In both Italy and Denmark, the inspection duration stated by farmers was four hours. The most relevant factors determining the duration of the control are type of control, the number of sanctions, farm complexity and farm size. This is in line with the fact that most European control bodies use the farm size as one variable for calculating the inspection costs (Organic Rules and Certification, 2011). On-farm processing leads to both, longer duration of the control and higher inspection costs, resulting in higher certification fees.

The inspection fee is the most relevant monetary expenditure for organic operators. The time spent by operators on the actual inspection visit compared to the total time operators spent per year on organic certification tasks was in most cases lower than 20 %. The most important perceived workload for farmers and processors was the time required for the preparation of the control visit which took up to 60 % of the total workload of farmers connected to organic certification. In the UK farmers stated to need about 25 hours for the preparation of the inspection visit, compared to 12 hours

¹² *The median is more appropriate than the mean in analysing samples with a high degree of dispersion.*

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in CZ and DE, 8 hours in DK or 4 hours in IT respectively. Organic operators from CZ invested quite some time in information search about organic certification (up to 40 % of the perceived total workload for organic certification). This might be a result of a high share of newcomers in the organic business. Indeed within the last 10 years, the organic sector in CZ showed considerable growth rates (European Commission, 2010).

Valued in monetary terms, the costs resulting from the time required for information search, documentation and preparation for the control visit were around 300 Euro per farm (Table 4). In the CZ, despite the additional efforts required for information search, the opportunity costs were lowest due to low hourly wages in agriculture. The highest opportunity costs, however, were found in Denmark and in the UK. In CH, CZ and DK, farmers commission some work associated with the documentation and preparation of control documents either to extension services or to accountant offices.

Table 4: Business costs of organic certification for farmers in 2008 (median, in Euro per operator and year)

	CH	CZ	DE	DK	IT	UK
Opportunity costs	253	133	303	434*	379*	590
+ Certification fee	535	318	495	–**	513	647
+ Annuity of investments	0	221	0	0	0	1
+ Outsourcing	38	160	0	144	0	0
- Subsidies	0	0	495	0	430	0
Total business costs	826	832	303	578	462	1,238

* duration of control estimated by farmers (operators' survey) as data from inspection records were not available

** not applicable due to public control system free of charge in DK

In some German *Länder* and in some Italian regions, farmers received public support for organic control costs (see also Section 2.5). In cases where farmers are offered public control cost support the subsidies cover almost the entire certification fee and thus lead to a considerable farmers' lower business costs compared those countries which do not subsidize organic control.

As far as organic processors are concerned, the median certification fees varied considerably from 477 Euro per processor in CZ up to 1,400 Euro for processors in the UK (Table 5). The differences in the inspection fees were mainly due to different organic turnover and business size. The analysis of the control reports of control bodies showed that the control visit of processors required only slightly more time than the control of the farmers. However, the processors' workload for preparing the control visit was stated to be considerably higher compared to the farmers. The total business costs of organic processors for organic certification varied between 1,553 Euro (CH) and 2,717 Euro (DE) per operator. This corresponds to a share of business costs of organic certification on the processors' organic turnover between 0.81 - 0.91 % Germany and Italy and between 0.16 – 0.46 % in the Czech Republic, Switzerland and the UK.

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Table 5: Business costs of organic certification for processors 2008 (median, in Euro per operator and year)

	CH	CZ	DE	DK	IT	UK
Opportunity costs	719	1,439	1,990	2,022*	922*	484
+ Certification fee	834	477	727	–**	900	1,400
+ Investments	0	0	0	0	0	0
+ Outsourcing	0	100	0	0	0	0
Total business costs	1,553	2,016	2,717	2,022	1,822	1,884
Organic turnover (Median)	948,630	587,115	337,200	3,487,124	200,00	413,755
Business costs of organic certification in % of organic turnover	0.16%	0.34%	0.81%	0.06%	0.91%	0.46%

* duration of control estimated by processors (operators' survey) as data from inspection records were not available.

** not applicable due to public control system free of charge in DK.

Administrative level

In addition to the costs borne by the operators the administration of organic certification causes further costs. The administrative costs of organic certification were estimated on the basis of a survey of the relevant authorities and organisations in the study countries and at the European Commission. These costs are borne

- by the standard owners, i.e. the European Commission with respect to the EU organic farming regulation (Council Regulation (EC) No 834/2007) and the private standard owners like the organic farming associations Bio Suisse in CH or Soil Association in the UK,
- by competent authorities supervising the organic certification system in Europe, and
- by the public organic control bodies in DK (Danish Veterinary and Food Agency and Danish Plant Directorate).

Cost of administrating the organic farming regulation at the European Commission level include labour costs (EU Commission staff as well as expert reimbursement) required for standard development, the EU expert and advisory groups as well as the Standing Committee on Organic Farming (SCOF) meetings of representatives of all Member States. These costs amount to five Euro per organic operator (Table 5).

The costs that are born by the Member States at the European level (e.g. the input given by national ministries to develop European regulations) could not be assessed in the course of this project. However, the cost of implementing the European standard at the national level was assessed and may indeed cover some of the time required to prepare for EU level meetings of Member States (see below).

The administrative costs of private standard owners varied between 37 Euro per operator (UK case) and 179 Euro (CH case) per operator. However, contrary to the

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administrative costs estimated for the Swiss private standard, in the UK the administrative costs did not include costs for standard implementation, managing imports, mutual acceptance of other standards or recertification respectively as such data were not available.

The workload of competent authorities for supervising the organic certification system was quite substantial in CZ, DE and DK. In CZ and DE, the workload of competent authorities per organic operator was nearly as high as the average workload per operator of control bodies (only about two hours less). For DK, it was difficult to allocate the public expenditures between the two tasks “supervision” and “control” because both tasks take place within the two public authorities responsible for the organic control system in Denmark. Thus, the public expenditures of the competent authorities for supervision of the organic control system may have been overestimated, while the public expenditures for the organic control may have been underestimated or vice versa. The total, however, is likely to be a reliable figure.

Table 6: Estimated administrative costs of organic certification in 2008 (in Euro per operator)

	CZ	CH	DE	DK	IT	UK
Standard owner						
EU Commission	7		7	7	7	
Private Standard		179				37**
Supervision						
Competent authorities	33	30*	79	325	5*	58
Public control system						
DK				253		
Total	40	209	86	585	12	95

* only national public expenditures; without public expenditures of regional authorities (Italy: 20 regions, Switzerland: 26 Cantons).

** not including costs for standard implementation, managing imports, mutual acceptance of other standards or recertification respectively as such data were not available.

Total cost

The total cost of organic certification is calculated as the sum of the operators cost and the administrative cost (Table 7). At a first look it seems that the systems in DE and IT perform cheaper for farms than the systems in CH, CZ, DK and in the UK. One might be tempted to attribute these lower costs to the specific system in DE and IT: In these countries private CBs are certifying a public standard. However, in some regions or *Länder* respectively, farmers receive public control cost support.

However, such conclusions are premature: The total certification costs of organic processing show that the differences between the countries and the certification systems analysed are quite low. The differences between countries due to varying labour costs or different political concepts (federal system versus centralised national

system) seem to be greater than the differences between certification systems. In addition in some countries, the tariff structure of control bodies privileges farmers. This results in relatively lower certification fees for farmers and relatively higher certification fees for processors. Thus, with respect to costs we could not identify a less costly certification system.

Table 7: Total certification costs per farm and processor 2008 (in Euro per operator)

	CH**	CZ	DE	DK	IT**	UK***
Farms	1,035	872	389 (884*)	1,163	474 (904*)	1,333
Processors	1,762	2,056	2,803	2,607	1,834	1,979

* without public control cost support.

** only national public expenditures; without public expenditures of regional authorities (Italy: 20 regions, Switzerland: 26 Cantons).

*** not including costs for standard implementation, managing imports, mutual acceptance of other standards or recertification respectively as data were not available.

3.2 Potential of alternative certification systems¹³

Twenty alternative certification schemes¹⁴ were screened for promising elements with regard to improving and strengthening the EU organic certification system. Based on this screening procedure, the following elements of certification were selected for further analysis:

- inspectors' training, qualification and update training done at national level,
- guidelines and specific rules regarding additional control measures,
- risk based inspection systems,
- participation in social networks (such as active participation in organic farmers networks),
- national online database on operators,
- harmonisation of interpretations and procedures,
- compatible operators data registration and administration across countries,
- compulsory operators training,
- quality management system on operator level.

By means of an online expert survey plus discussion and voting during a CERTCOST expert meeting,

- risk based inspection,

¹³ This Chapter uses text from Meinshausen et al. (2011).

¹⁴ USDA NOP, Japanese Organic Standards, ICS Internal Control System, Participatory Guarantee systems, Forest Stewardship Council, Marine Stewardship Council, Rainforest Alliance, GLOBALG.A.P., UTZ certified, SA 8000 (Social Accountability), FLO Fairtrade Standards, WFTO (World Fair Trade Organisation), Fair for Life, Naturland fair, FairWild, Cafe Practices / Starbucks, CCCC (4C), Food safety systems (IFS, BRC), HACCP, ISO norms ISO14'000, ISO 22'000, ISO 9000, Nature Plus (ICEA, ANAB, Bioarchitecture)

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- social networks as well as
- training of operators, control bodies and competent authorities

were considered as the three most promising elements for further analysis. The issue of a harmonised interpretation and procedures and some aspects of specific guidelines on additional control measures are included in these elements. This resulted in the formulation of nine suggestions which may have the potential to improve the EU organic certification system:

1. guideline to harmonise the understanding of EU organic Regulation about risk based inspection,
2. a) reduced control for lowest risk operators;
b) exemption for small producers,
3. off-site/remote controls instead of on-site controls (in case of additional inspections),
4. social network risk factors included in a risk based inspection system,
5. monitoring / watch institution for organic operations,
6. guide for understanding of the EU organic farming regulation,
7. subsidies for operators' training,
8. basic central training on the EU organic regulation for all involved stakeholders: competent authorities and control bodies,
9. supporting networking and knowledge exchange between competent authorities and control bodies at national level.

After another screening within the project group a number of these suggestions have become part of the overall recommendations of the project (Dabbert, 2011).

4 CONSUMERS AND ORGANIC CERTIFICATION¹⁵

Organic products are ultimately produced for the consumer. Certification is a means to guarantee their organic integrity. In most cases product labelling with organic certification logos is used to communicate to consumers that the product has been produced according to organic principles under the inspection of an independent control body. Thus organic certification logos are a key communication tool and they are closely connected to the purpose of the certification system. We thus present in this Chapter results on the following topics:

- Background to why certification logos are needed (organic goods are credence goods),
- spectrum and importance of different organic certification logos,
- consumer awareness, perceptions and attitudes regarding organic certification logos,
- willingness-to-pay for organic certification logos,
- factors influencing willingness-to-pay, and
- consumer views on a mandatory EU logo for organic food.

¹⁵ This Chapter uses text from Janssen and Hamm (2011).

4.1 Organic goods are credence goods¹⁶

An important economic idea is that information is often costly. Regarding the collection of information on quality attributes of goods, economists differentiate three categories. The first category implies the lowest cost of information, the last the highest cost to collect information on the product:

- search attributes,
- experience attributes and
- credence attributes (Nelson, 1970; Darby and Karni, 1973).

Search attributes 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 attributes of a good cannot be reliably assessed by the consumer, neither before nor after purchase of the good. The organic quality of a tomato which results from the production process is such a credence quality (Lippert, 2005). In this case consumers have to rely on the organic claim or labelling of an organic food product, since they cannot verify the information about the organic credentials. The producers on the other side possess all relevant information on the organicness, since only they know how the good was produced. In this constellation, the information on the product quality is asymmetrically distributed between seller and buyer.

In such a situation with lack of information and information asymmetrically distributed between consumers and producers market failure can result. Market failure refers to situations where markets cannot fulfil their function of allocating resources optimally. In cases where buyers are not fully informed on the characteristics of a good (quality uncertainty), they will likely be willing to pay for an expected (unknown) average quality. If in such a situation high quality goods cannot be produced at the price consumers are willing to pay, 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 address the problem of quality uncertainty related to organic food (Golan et al., 2001; Giannakas, 2002). Without certification, consumers would face severe quality uncertainty and a high potential for mislabelling. Consumers willing to buy organic food would face huge information costs in order to reliably check the organic quality, as it was the case in many instances before the EU organic regulations came into force. The certifier as a third party, independent from the producer and the 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 products.

¹⁶ This Section uses parts of the report by Zorn et al. (2009) in a revised version.

4.2 Spectrum and importance of organic certification logos

Organic certification logos can be classified into four main kinds of logos:

- EU logo (new mandatory EU logo and former voluntary EU logo),
- national governmental logos,
- logos of farmers' associations and their umbrella organisations, and
- logos of private certification bodies.

According to an inventory study conducted in autumn 2008 (before the new EU logo was introduced), the importance of individual kinds of logos differed considerably between the CERTCOST study countries (CH, CZ, DE, DK, IT, TR, and UK). The former voluntary EU logo, for instance, was found on products relatively often in IT and DK, whereas it played a minor or negligible role in the other countries.¹⁷ In those countries with voluntary national governmental logos (CZ, DE, DK), the governmental logo was found on more than 60 % of recorded products. The share of organic products without any certification logo ranged from almost one third in the UK to zero in TR (due to the governmental logo being mandatory). Altogether, a very diverse picture was revealed regarding the kinds and frequencies of different organic certification logos.

Across all countries, the mean number of logos per product averaged 1.3 with half of the products having one logo. One third of products carried two logos and 13 % had none.

When price differences between products with and without certain organic logos were analysed for each country, only a few significant price differences in each country were found. The results suggest that there may not be a consistent pattern across countries that particular kinds of certification logos are reflected in higher market prices. However, market prices across different shops may be influenced by a number of factors other than organic certification logos, for instance price policies of individual retailers, regional parameters and aspects of product quality.¹⁸

4.3 Consumer awareness, perceptions and attitudes regarding organic certification logos

In a combination of qualitative and quantitative consumer research in the study countries (CH, CZ, DE, DK, IT, TR, and UK) the logos shown in Table 8 were investigated. The results revealed that consumers had a low level of factual knowledge about organic production standards and the organic control system. The countries have in common that the great majority of participants were not aware that the use of the term 'organic' is regulated. Despite the low level of knowledge, consumer attitudes differed across the logos and consumers perceived differences among different organic certification schemes, but mostly in terms of 'stricter' versus























¹⁷ *The inventory study was conducted prior to the introduction of the new mandatory EU logo for organic food.*

¹⁸ *Further data analyses were carried out in DE. A significant price premium was recorded for products of the farmers' association Demeter (Schmidt and Janssen, 2010).*

‘less strict’ production standards and control systems. Figure 2 gives an overview of the results of the quantitative study on consumer awareness, perceptions and attitudes regarding different organic logos. The quantitative study involved approximately 400 consumers per country.

In all countries except IT, a considerable share of participants falsely thought that one or two logos stand for domestic origin. In fact, only one of the tested logos indicates domestic origin, i.e. the Bio Suisse logo. This example demonstrates that consumer perceptions of what stands behind an organic logo are not necessarily based on objective facts.¹⁹

Table 8: Organic labels shown to consumers and tested in the choice experiments

Country	Product 1	Product 2	Product 3	Product 4
CH	Fake logo ¹ 	Bio Suisse ² 	Demeter ³ 	Without logo ⁴
CZ	Former EU logo 	Governmental logo 	Demeter ³ 	Without logo ⁴
DE	Former EU logo 	Governmental logo 	Demeter ³ 	Without logo ⁴
DK	Former EU logo 	Governmental logo 	Demeter ³ 	Without logo ⁴
IT	Former EU logo 	CCPB ⁵ 	Demeter ³ 	Without logo ⁴
TR	IMO ⁶ plus governmental logo 	Ecocert ⁶ plus governmental logo 	Orser ⁷ plus governmental logo 	Governmental logo 
UK	Former EU logo 	Soil Association ⁸ 	OF&G ⁹ 	Without logo ⁴

¹ Referring to the Swiss governmental organic regulation.

² Swiss farmers’ umbrella organisation.

³ International farmers’ association.

⁴ Products just marked with the prefix ‘organic’, ‘Bio’, ‘Öko’, ‘biologico’, ‘øko’ respectively in the national language.

⁵ CCPB=Certificazione e controllo prodotti biologici. Italian control body.

⁶ Control body which operates in many countries.

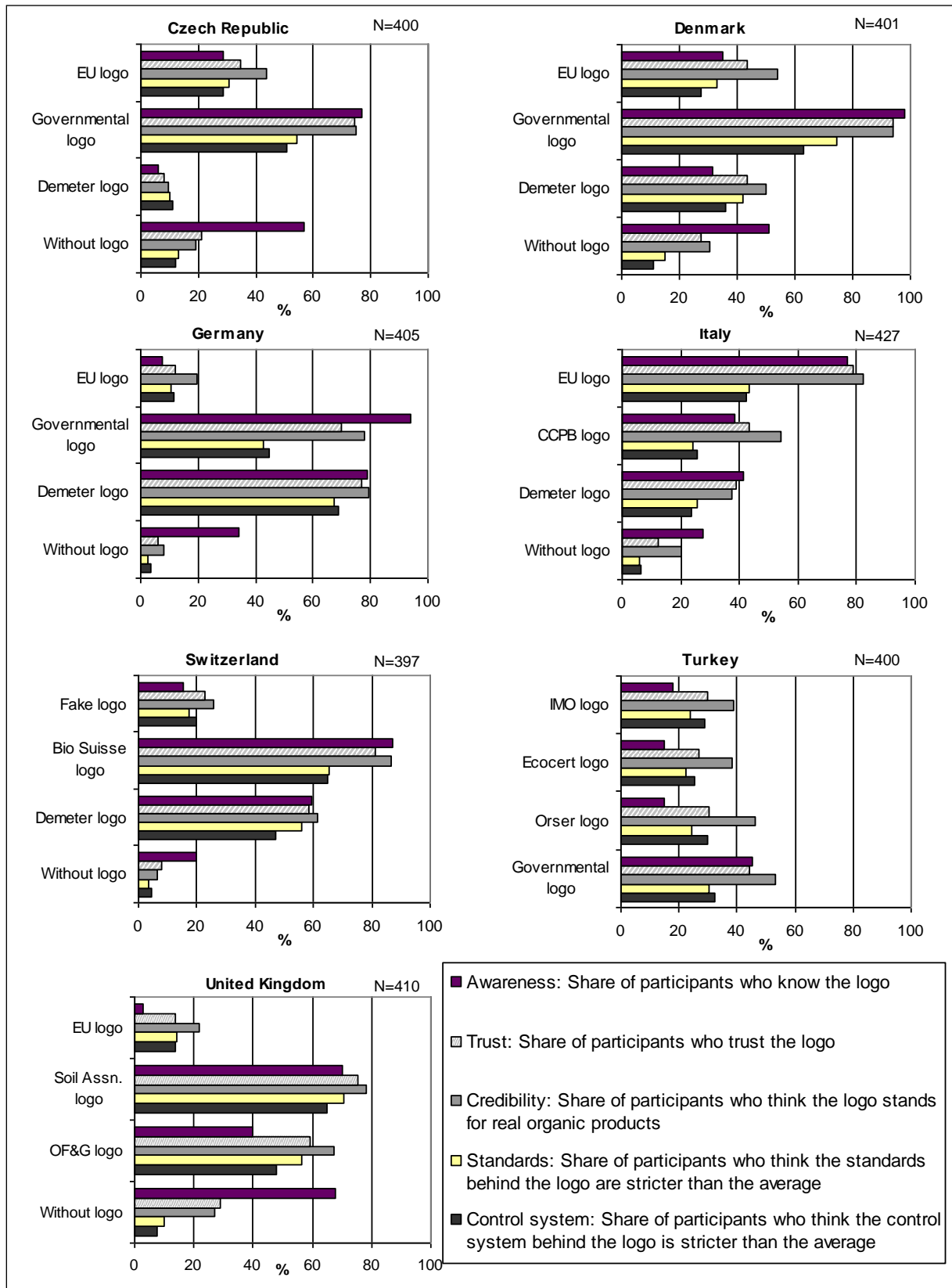
⁷ Turkish control body.

⁸ Soil Association=British organic sector organisation.

⁹ OF&G=Organic Farmers & Growers. British control body.

¹⁹ The overall low level of consumer knowledge of organic logos is confirmed by a Eurobarometer study (European Commission, 2011)

Figure 2: Consumer awareness, perceptions and attitudes regarding different organic logos¹



¹ See Table 8 for a description and the full name of the logos. 'Without logo' refers to products labelled with the prefix 'organic' without a logo.

4.4 Willingness-to-pay for organic certification logos

The willingness-to-pay for organic certification logos was analysed with the method of choice experiments. In the choice experiments, the participants were asked to make buying decisions for apples and eggs. The four products among which they could choose looked identical but were labelled with different prices and organic labels.

Our results provide evidence that consumers prefer products with an organic certification logo over organic products without a logo (Figure 3). The great majority of consumers did not know that the use of the term 'organic'²⁰ is protected by EU regulation and thus they did not trust products without a logo that were only labelled 'organic'. For almost all tested organic logos, consumers were on average willing to pay a price premium compared to a similar organic product without a logo. That even holds true for a fake logo tested in CH. However, the price premium they were willing to pay differed a lot between the tested logos. In CH, CZ, DK and IT, there was *one* logo with a considerably higher willingness-to-pay (WTP) compared to the other tested logos. Those were the Bio Suisse logo, the Czech and Danish governmental logos and the EU logo in IT. In DE and the UK, there were *two* logos with an equally high WTP, namely the governmental logo and the logo of the farmers' association Demeter in DE and the logos of the Soil Association and the certification body 'Organic Farmers & Growers' in the UK. A comparison between the different kinds of logos revealed the following picture:

Former EU logo: In DE, CZ, DK and the UK, the WTP for the former EU logo was only slightly higher compared to products without a logo. In contrast, the EU logo reached the highest WTP of all logos tested in IT where no governmental logo exists.

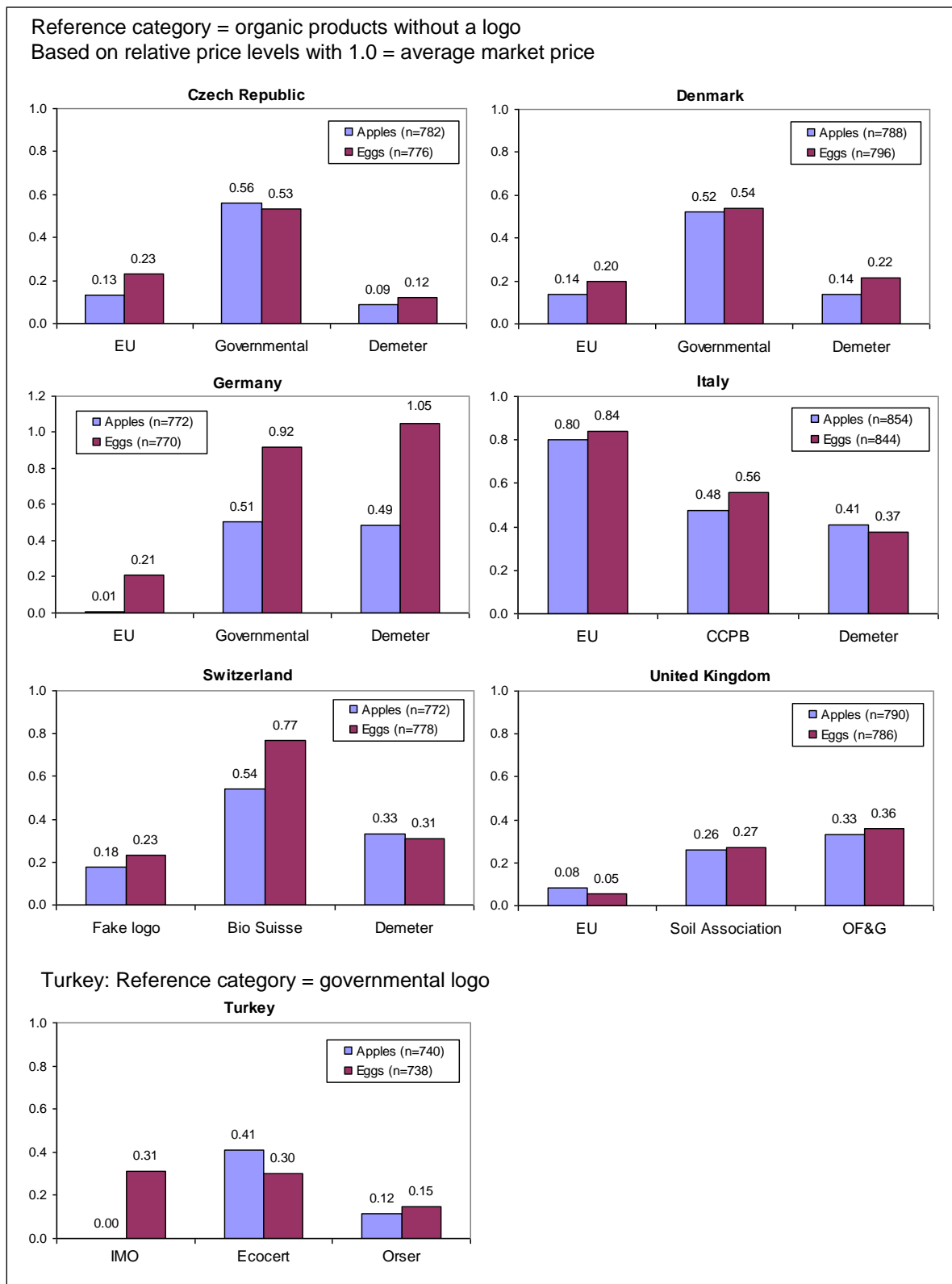
National governmental logos: In CZ and DK, the governmental logo featured the highest WTP of all tested logos. In DE, the WTP for the governmental logo and the Demeter logo were equally high.

Certification logos of private organisations: In CH and the UK, the highest WTP was observed for private logos. However, both countries do not have a governmental logo and the former EU logo was not common in the UK and not relevant in CH. The Demeter logo featured a high WTP only in DE, whereas in CZ, DK, IT and CH, the WTP for the Demeter logo was considerably lower compared to the logos with the highest WTP.

TR represents a special case in that the experimental design was slightly different. Here, all products in the experiment were marked with the mandatory governmental logo and three of the products carried an *additional* logo of a certification body. It was found that consumers were willing to pay a price premium for the logo of the certification body Ecocert. For the logo of the certification body IMO, a price premium was only recorded for one of the two tested kinds of products (the tested products were apples and eggs).

²⁰ This covers also the respective translated terms of 'organic' in the different EU languages, such as 'Bio', 'Öko', 'biologico', 'øko'.

Figure 3: Mean additional willingness-to-pay for organic certification logos¹



¹ The figures show the additional WTP for a product with a respective organic logo compared to organic products without a logo. The additional WTP is shown in percent of the average market price. For example, in DE the additional WTP for apples with the governmental logo compared to organic apples without a logo amounted to 51% of the average market price. A description and the full name of the logos are presented in Table 8.

4.5 Factors influencing willingness-to-pay for organic certification logos

Two sets of factors influencing consumers' willingness-to-pay (WTP) for organic certification logos were identified:

Consumer awareness, perceptions and attitudes regarding an organic logo: In the choice experiments, the WTP for a certain organic logo was higher the better known the logo was, the more trustworthy and credible a consumer rated the logo, and the stricter a consumer rated the underlying standards and the control system. In CH and DE, the WTP for a logo was also higher if the consumer thought that the logo indicates a domestic origin. The result from DE is surprising, since none of the tested logos in DE indicates a domestic origin.

Consumers' buying behaviour for organic food: The findings show that consumer preferences for certain organic logos were related to certain characteristics regarding the buying behaviour for organic food (Table 9). For certain organic logos, foremost the Demeter logo, a higher willingness-to-pay was recorded for frequent buyers of organic food and customers of organic food shops compared to less frequent buyers and non-customers of organic food shops. This result seems plausible since Demeter products can mostly be bought in organic food shops.²¹

4.6 Consumer views on a mandatory EU logo for organic food

The concept of a mandatory EU logo and indication of origin for organic food was met with a divided response across the EU countries represented in the CERTCOST project.²² Two significantly distinct countries could be identified: IT and the UK (Figure 4 and Figure 5). In IT, the introduction of a new mandatory EU logo was basically welcomed without reservation (Figure 4), whereas in the UK, both support and scepticism were present. In DE, DK and CZ trust in the standards and the inspection system behind the EU logo was higher than in the UK but still not particularly pronounced (Figure 5).

In all countries, it became apparent that the participants generally lacked knowledge about the organic regulations and control of organic production at EU level. Interestingly, the concerns that were raised were mostly unfounded since they resulted from misconceptions, such as the belief that the organic standards in other European countries were less strict than the domestic ones. It became obvious that consumers did not view the EU as a homogenous entity in terms of trust in the integrity of organic products. Therefore the indications of origin 'EU agriculture' and 'non-EU agriculture' were almost unanimously rejected.

²¹ Please note that specialised organic food shops have very different market shares across the study countries. Whereas they play an important role in the organic market in Italy, they are of low importance in Switzerland and Denmark where the great majority of organic products is sold via conventional supermarkets.

²² In the qualitative and the quantitative study, the participants were informed that a new mandatory EU logo and indication of origin would be introduced. However, the new logo design could not be shown, since data was collected prior to the introduction of the new EU logo.

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Table 9: Consumers buying behaviour for organic food and WTP for organic logos

Country	Organic logo ¹	Frequent buyers of organic food	Customers of organic food shops²
		have a higher/lower WTP compared to less frequent buyers	have a higher/lower WTP compared to non-customers
CH	Demeter	higher WTP	higher WTP
	Bio Suisse	higher WTP	lower WTP ³
CZ	Governmental	higher WTP	higher WTP
DE	Demeter	higher WTP	higher WTP
	Governmental	lower WTP ⁴	–
DK	Demeter	higher WTP	higher WTP
IT	Demeter	higher WTP	higher WTP
	CCPB	lower WTP	–
TR	IMO	higher WTP	–
	Ecocert	higher WTP ⁴	–
UK	Soil Association	higher WTP ³	–
	OF&G	–	lower WTP ³

¹ See Table 8 for a description and the full name of the logos.

² Also in DK and CH where (almost) all choice experiments were conducted at conventional supermarkets, more than 40% of the participants stated to (also) buy at organic food shops.

³ Significant in the apple model but not in the egg model.

⁴ Significant in the egg model but not in the apple model.

– No significant influence.

Figure 4: Attitudes towards the EU logo

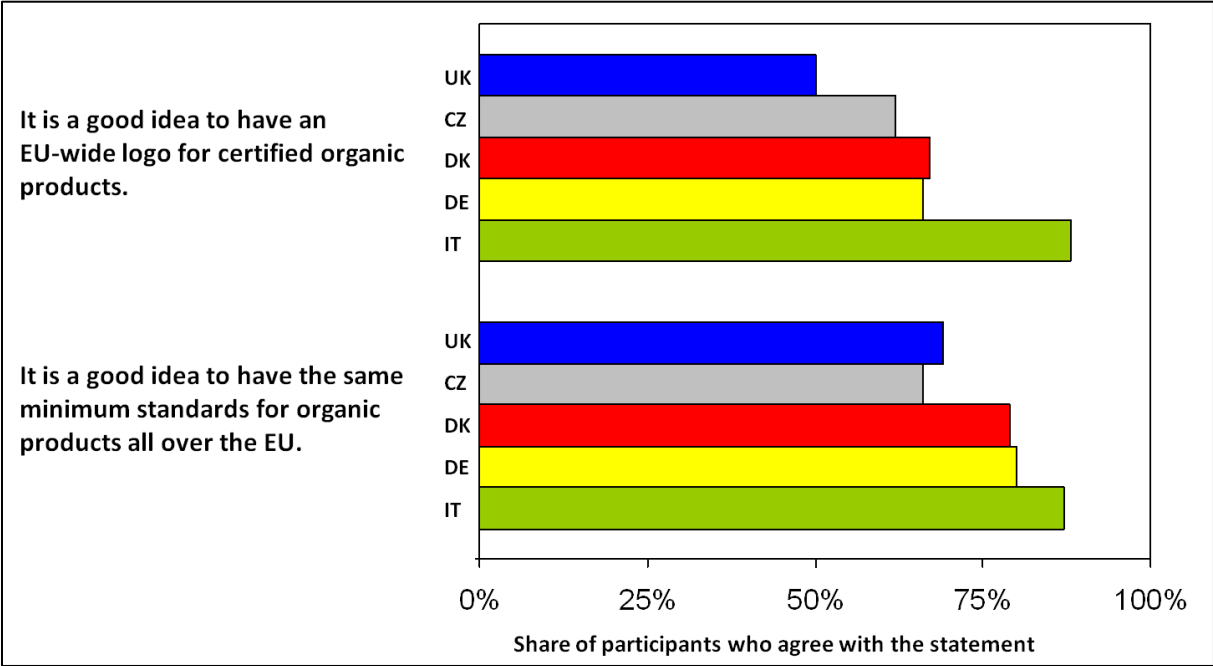
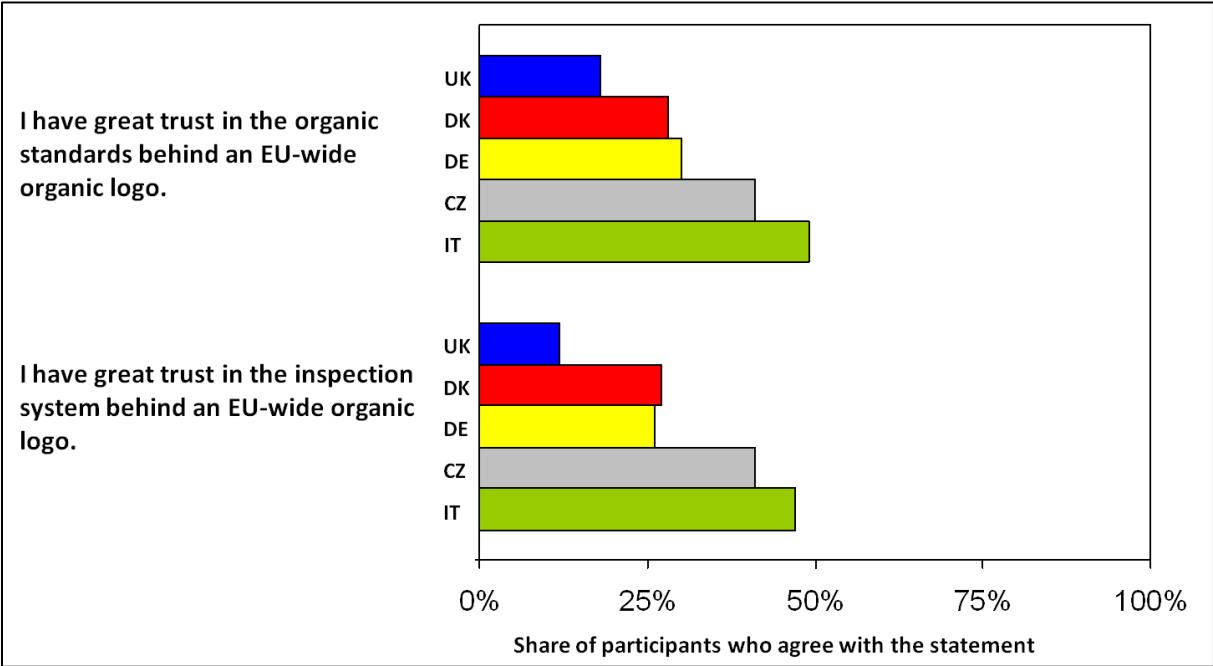


Figure 5: Trust in the EU logo



5 ANALYSING THE RISK OF NON-COMPLIANCE

Two potential interpretations of the risk of non-compliance are important: A narrower definition that defines risk as probability that a non-compliance occurs, and a more general risk definition where risk is related to overall potential damage (from an environmental and social point of view). In the following we first briefly discuss the conceptual background which we describe as the “economics of non-compliance”, then show some descriptive results. Subsequently we analyse the risk of non-compliance using quantitative approaches and finally consider a heuristic model of the sector. The quantitative analytical approaches (econometric and Bayesian network analysis) are based on the narrower definition of risk. The heuristic model takes the wider social view.

5.1 Economics of non-compliance²³

Economists have developed a specific approach to analysing individuals that do not obey the law, which is known as the “economics of crime”. This approach can also be made relevant to better understand the costs and benefits of non-compliance with the organic standard.

²³ This Section uses parts of the report by Zorn et al. (2009) in a revised version.

According to the economics of crime, opportunistic individuals decide between two alternatives: Either to comply with a law or not to comply. This decision is based on rational considerations by comparing the total pay-off of the two alternatives (Eide, 2000). An opportunistic individual obviously is defined as somebody for whom the law is not an absolute line, which shall not be crossed.

The asymmetric information between buyer and seller (cf. Section 4.1) typical for organic farming increases the likelihood that individuals or firms behave opportunistically. Thus we have to recognize that the possibility for fraud or other forms of non-compliance to organic standards exist. This does not mean that fraud is omnipresent among organic farmers and producers. It rather points to the existence of certain possibilities. The “rules of the game” (such as formal and informal rules, laws etc.) are devised to limit the actual occurrence of non-compliance and fraud. Examples of non-compliance 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 Gary Becker’s model (Becker, 1968) the factors determining organic non-compliance are:

- income (monetary profit) of non-compliance,
- probability that non-compliance is detected, and
- penalty (monetary fine plus other sanctions) in case of detection and the corresponding punishment.

Given the other factors, the likelihood of non-compliance will increase with

- higher financial gain of non-compliance,
- lower probability that non-compliance is detected, and
- lower penalty in case of detection.

5.2 Sanctions and non-compliance²⁴

Modelling risk-based inspections systems for the organic certification system means to explain the probability of detection of non-compliances with a set of risk factors, or variables. In general our interest is to explain non-compliance of organic operators. Non-compliance with the EU-regulation is what jeopardizes the trust of consumers and what should be avoided. However, because the data on sanctions is better structured and more reliable, we use sanction data as a proxy variable for all countries, except for the UK CB, where no sanction data was available. We thus report in this Section the frequencies of different categories of sanctions found. However, we interpret that the factors found to influence the probability to get a sanction will similarly influence the probability of non-compliance. This becomes relevant in Section 5.3.

²⁴ This Section uses text from Gambelli et al. (2012) in a revised version.

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Here we report analysis results based on data from control bodies in CH, CZ, DE, IT and UK and the control authorities in DK. We are grateful to the control bodies and control authorities for making these data available to us. To our knowledge it is the first time that such data across a number of control bodies and countries has been available for scientific analysis.

In analysing these data it has to be kept in mind that the data was collected by the control bodies to effectively run their business of organic certification in a specific natural, legal and cultural environment. The data was not intended by the control bodies for the use of scientific analysis, which explains some of the shortcomings that come to light if the data is used that way. The data has thus to be interpreted with caution. It covers one case (control body) per country (with the exception of Denmark where we have data on all operators, controlled by two control authorities). Though we tried to include important control bodies with a large number of operators as customers, the data are not representative (except in the case of DK). The data cover characteristics of organic operators and their production as well as the characteristics and results of organic control visits in the years 2007 to 2009.

A key problem we faced in the analysis is that sanctions are categorised differently between the CBs (and CAs) investigated. In order to move towards more comparable categories a scheme for homogenisation was developed (Table 10). In our quantitative analysis we used only two categories of sanctions: slight and severe. The actual number of different sanctions behind these summary categories differs substantially between the countries investigated. We interpret slight sanctions as being related to slight non-compliances and severe sanctions as related to severe non-compliances.

An example of a slight non-compliance would be that the operator did not update the description of his operation on his own initiative when something has changed there. To such a slight non-compliance a warning could be issued as a sanction. An example of a severe non-compliance could be if synthetic nitrogen was used on purpose on a field. This could lead to a severe sanction. Such a severe sanction might be that the operator is prohibited from marketing products with indications referring to the organic production method for a certain period. The details will of course always depend on the specific case.

For UK sanctions were not available, but differentiated data on non-compliances exist. In UK four categories of non-compliances exist, ranging from the less severe to the most severe: minor, major, critical and manifest. The manifest non-compliances are the most severe, but were not recorded in the CB database in the years of our survey. In order to be coherent with our previous two-group categorisation of sanctions, we have grouped minor and major non-compliances together in one category.

Table 10: Number of sanction types by homogenised sanction category and country

Homogenised sanction category	CH	CZ	DE	DK	IT
slight sanctions	7	2	4	7	2
severe sanctions	10	2	3	6	3

Table 11 shows the distribution of farms by sanction type across CBs and CAs respectively, and years. In the case of the German CB around 40 % of the farmers were sanctioned per year. For the CBs located in CZ and IT and the CAs of Denmark in contrast, the share of farmers sanctioned was well below 10 %. The difference mainly results from many weak sanctions imposed on German organic farms by the CB investigated. Remarkable is the distribution of sanctions for the CB located in CH, where more severe sanctions than slight sanctions were imposed.

Table 11: Distribution of farms, by homogenised sanction/non-compliance category, country, and year

Country	Year	Farms with <u>slight</u> sanctions (UK: non compliances)		Farms with <u>severe</u> sanctions (UK: non compliances)		Total number of farms
		Nr.	Percent	Nr.	Percent	
CH	2007	73	1.6	191	4.1	4661
	2008	57	1.2	145	3.2	4508
	2009	77	1.8	116	2.6	4388
CZ	2007	6	0.8	0	0	700
	2008	12	1.6	0	0	740
	2009	84	10.5	7	0.8	877
DE	2007	776	48.9	35	2.2	1584
	2008	799	47.4	29	1.7	1686
	2009	794	37.0	15	0.7	2145
DK	2007	156	6.0	20	0.8	2589
	2008	175	6.6	32	1.2	2654
	2009	51	2.0	14	0.6	2505
IT	2007	767	8.1	103	1.1	9398
	2008	572	6.1	198	2.1	9351
	2009	533	5.0	200	1.9	10732
UK	2007	737	40.5	16	0.9	1820
	2008	1016	47.2	14	0.7	2151
	2009	988	45.8	48	2.2	2155
TR*	2008	-	-	574	20.0	2871
	2009	-	-	794	18.8	4213

* For Turkey the shown data represent the sum of data provided by 2 CBs. The recorded sanctions are all severe.

Overall we interpret that these results reflect mostly different strategies of control bodies to deal with sanctions rather than different non-compliance behaviour of operators. The differing strategies of the control bodies are likely to be related to the specifics of the national legal system.

The share of farms with severe sanctions/non-compliances is at a similar low level in all countries analysed and ranges from 0 to 4 % of the farms controlled. However, the shares of severely sanctioned/non-compliant farms change considerably between years in all European countries.

5.3 Statistical and Bayesian network modelling²⁵

The factors determining the risk of sanctions (CH, DE, IT) and non-compliance (UK), were analysed using two quantitative methods: Econometric modelling and Bayesian belief networks. Econometrics is a specific branch of statistics with methods specifically adapted to the problems in data coming from the real world and not from experiments. Bayesian belief networks (BN) are a mathematical technique based on graphs, capable of dealing with conditional probabilistic dependencies between variables. The two methods will not reveal necessarily the same structure in the data, however, in practice we often found them to produce similar results. The use of two different techniques thus reinforces the credibility and reliability of the results. We refrain from a detailed discussion of the techniques here. Such a discussion will be made in scientific papers which will be produced from the project work (e.g. Zorn et al., 2011).

The practical aim of the work is to provide tools to target inspections and to focus efforts onto the most critical categories of organic operators.

As we see sanctions as a proxy variable for non-compliance and as non-compliance is the variable we really want to explain, we have summarized and interpreted the results in this Section ignoring the distinction between non-compliance and sanctions. We thus interpret all results as explaining non-compliance in this Section.

A set of factors that are potentially influencing the likelihood of non-compliance (and sanctions) (Table 12) has been defined. During the course of the project a number of hypotheses have been elaborated on the influence of these factors. In summary: before starting the analysis we had an idea on the possible causal relationship between the variables listed in Table 12 and non-compliance. These ideas go back both to the economics of crime discussed above and to a number of stakeholder consultations (e.g. such as reported in Miran et al., 2009).

²⁵ This Section uses text from Gambelli et al. (2012) in a revised version.

Table 12: Variables that potentially may influence the risk of non-compliance

Risk factor category	Variables
General risk factors	<ul style="list-style-type: none"> • non-compliance occurrence (slight non-compliance affecting severe non-compliance and vice versa) • non-compliance occurrence in the past (BN model only) • Number of other certification schemes
Structural/managerial farm specific risk factors	<ul style="list-style-type: none"> • Farmer is a licensee (in IT: has a license to market organic products) • Farm size (ha) • Non organic land • Farmers Experience • Number of products/Processing activities
Specific crop risk factors	<ul style="list-style-type: none"> • GMO-risk crops • Complexity of crops production • Cereals • Industrial crops • Dried pulses • Root crops • Grassland • Green fodder • Green manure • Unutilised land • Other arable crops • Vegetables • Fruits • Olives • Grapes • Citrus
Specific livestock risk factors	<ul style="list-style-type: none"> • Bovine • Goats • Pigs • Poultry • Sheep • Livestock units (LU) (BN models only) • Complexity of livestock production • Livestock density (BN models only) (LU/ha > 2)

In Table 13 (slight non-compliance) and Table 14 (severe non-compliance) the main findings of a large number of calculations are summarised. The results have been interpreted across countries and years in order to identify possible common patterns. In the tables, for each factor, it is shown whether an influence on non-compliance has been found, for *at least one* method:

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- always: in all countries (indicated by ✓✓✓),
- often: in at least 3 countries (indicated by ✓✓),
- seldom: in one or two country (indicated by ✓), or
- not at all (indicated by an empty cell).

The most common case for the variables is that they are seldom influencing non-compliance. This means that for most variables no pattern across countries and years emerges. However, for the following variables an influence on increasing the risk of non-compliance has *a/ways* been found:

- the occurrence of non-compliances in the same year, and
- the occurrence of non-compliances in past years.

Additionally, and for slight non-compliances only, the following factors have been found as always increasing the risk:

- farm size,
- pigs on the farm, and
- poultry on the farm.

It is remarkable that we did not find any factor as always decreasing the risk of any category of non-compliance. Only fruits often appear being related with a decrease of the risk of severe non-compliances.

In summarizing the findings of Table 13 and Table 14 we can say: For most variables we only seldom find an influence on non-compliance. The most notable exceptions are the occurrence of non-compliances in the same year and in the past. There are a limited number of cases – all related to crop-specific risk factors – where the sign of the variable (decreasing or increasing non-compliance) was found changing between cases investigated. In general crop-specific risk factors do not appear of great relevance in explaining risk.

Overall these results can be interpreted as to imply some caution regarding a generalised assessment of risk factors for non-compliance. Depending on different site conditions, CBs and inspection behaviour as well as on the dynamics of the inspection system the significant risk factors are likely to change with country, CB and time. Therefore, in practice, rule-based or statistical assessment of risk aimed at implementing risk-based inspection strategies is possible, but need to be country-specific and should be carefully revised in order to update the risk-assessment with the increasing amount of evidence through time. However, we believe that the current available datasets at CB level are not specialised enough to allow thorough risk-based inspections, and should be complemented by other information, especially concerning the operator's trustworthiness. In general, our results show that, currently, the information collected and stored by CBs is not yet sufficient to implement an efficient and effective risk-based inspection system. Additional information concerning the operators themselves could be particularly helpful for better explaining non-compliance and sanctions with econometric tools. Such additional information could include economic and financial information on the operators, such as turnover, loans, solvency rate, criminal records, and similar information.

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Table 13: Factors explaining the risk of slight non-compliance: Incidence of results found in cross country calculation using different models

variable	An influence on the risk of non-compliance was found	
	increasing the risk of non-compliance	decreasing the risk of non-compliance
General risk factors		
non-compliance occurrence in the same year (severe non-compliances)	✓✓✓	
non-compliance occurrence in the past (BN model only)	✓✓✓	
Farmers Experience		✓
Structural/managerial farm-specific risk factors		
Farmer is a licensee	✓	
Number of other certification schemes	✓	
Farm size (ha)	✓✓✓	
Non organic land		✓
Number of products/Processing activities	✓✓	
Crop-specific risk factors		
GMO-risk crops	✓	
Complexity of crops production	✓✓	
Cereals	✓	
Industrial crops	✓	
Dried pulses	✓	
Root crops	✓	
Grassland	✓	✓
Green fodder	✓✓	
Unutilised land	✓✓	
Other arable crops	✓	
Vegetables	✓	
Fruits	✓	✓
Olives	✓	
Grapes	✓	
Citrus	✓	
Livestock-specific risk factors		
Bovine	✓✓	
Goats	✓✓	
Pigs	✓✓✓	
Poultry	✓✓✓	
Sheep	✓✓	
Livestock units (LU) (BN models only)	✓✓	
Complexity of livestock production	✓	
Livestock density (BN models only) (LU/ha > 2)	✓	

For each factor, it is shown whether an influence on non-compliance has been found, for *at least one method*:

- always: in all countries (indicated by ✓✓✓),
- often: in at least 3 countries (indicated by ✓✓),
- seldom: in one or two country (indicated by ✓), or
- not at all (indicated by an empty cell).

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Table 14: Factors explaining the risk of severe non-compliance: Incidence of results found in cross country calculation using different models

variable	An influence on the risk of non-compliance was found	
	increasing the risk of non-compliance	decreasing the risk of non-compliance
General risk factors		
non-compliance occurrence in the same year (severe non-compliances)	✓✓✓	
non-compliance occurrence in the past (BN model only)	✓✓✓	
Farmers Experience		✓
Structural/managerial farm-specific risk factors		
Farmer is a licensee	✓	
Number of other certification schemes		✓
Farm size (ha)	✓✓	
Non organic land	✓✓	
Number of products/Processing activities	✓	
Crop-specific risk factors		
GMO-risk crops	✓	
Complexity of crops production	✓✓	
Cereals	✓	✓
Industrial crops	✓✓	
Dried pulses	✓	
Root crops	✓✓	
Grassland	✓	✓
Green fodder	✓✓	
Unutilised land	✓	
Other arable crops	✓	
Vegetables	✓	
Fruits		✓✓
Olives		✓
Grapes	✓✓	
Citrus	✓	
Livestock-specific risk factors		
Bovine	✓✓	
Goats	✓	
Pigs	✓✓	
Poultry	✓✓	
Sheep		
Livestock units (LU) (BN models only)	✓	
Complexity of livestock production	✓✓	
Livestock density (BN models only) (LU/ha > 2)	✓	

For each factor, it is shown whether an influence on non-compliance has been found, for *at least one method*:

- always: in all countries (indicated by ✓✓✓),
- often: in at least 3 countries (indicated by ✓✓),
- seldom: in one or two country (indicated by ✓), or
- not at all (indicated by an empty cell).

5.4 Heuristic model of organic certification²⁶

A heuristic model is a rule-based model that helps to better understand reality. It is built upon theory and information sources that are only loosely connected and would not qualify as a direct representation of reality. In our case the purpose of developing such a model is to understand the interplay of important factors that determine non-compliance, to derive consistent hypotheses for statistical analyses, and especially to make qualitative statements on optimum inspection strategies.

The general theoretical framework for modelling an opportunistic (or inadvertent) operator's decision to comply with an organic standard or not is based on the economics of crime approach (see Section 5.1). It is assumed that operators will commit non-compliance, when

- the expected benefit of non-compliance
- is bigger than the expected costs associated with it.

Both variables (benefits and costs) can then be divided into more detailed variables. For example, the costs of non-compliance depend (among other things) on the probability to get caught, the magnitude of the fine received²⁷ if caught and the damage if the product cannot be marketed anymore as organic. By separating the problem this way into a number of variables and then making reasonable assumptions about probabilities, fines etc., it is possible to produce a quantitative model of organic certification that includes many important variables and that can at the same time be used for simulation.

The objective of such simulations is to implement sanctions and inspection frequencies in a way that net social cost arising from farmers' non-compliance with organic standards will be as small as possible. Net social cost here mainly consists of social damages linked to non-compliance plus cost resulting from control efforts. For this purpose the number of non-complying farms – which is supposed to decrease with increasing monetary value of sanctions as well as with increasing detection probability – has to be modelled.

To derive statements on optimum risk-based inspection strategies one has to be aware that important parameters like farmers' average compliance cost or average damages resulting from non-compliance with standards will never be known exactly. This means for these variables reasonable assumptions have to be made. Only under such assumptions is it possible to produce quantitative simulations.

The simulations performed by means of the heuristic model developed in our project showed among other things that even without fines a situation can be imagined where a large proportion of organic farmers complies with organic standards. Fines can facilitate standard enforcement and reduce corresponding social cost. Another general result was that organic farms should be divided into relatively homogenous

²⁶ This Section uses text from Gambelli et al. (2012) in a revised version, compare Lippert et al. (2011) for more details.

²⁷ Currently no fines are implemented in the organic certification. However, as fines are one possibility to improve the system they are implemented in the heuristic model.

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groups when designing inspection strategies since then the effects of different control strategies on farmers' compliance behaviour are easier to assess.

6 CONCLUDING REMARK

In this report we presented facts about the European certification system. These facts have been collected and analysed within the CERTCOST project. “Facts talk for themselves” a saying goes. We hope that – with some interpretation which we give to the facts – this proverb is also true for this report.

But an analysis of the status quo is not enough. Stakeholders interested in the organic certification system want to know how the system can be improved. From the project results we have thus developed recommendations. These recommendations are listed and explained in a separate report (Dabbert, 2011) which you might want to consult next.

7 REFERENCES

- Abay, C., Uysal, Ö. K, Miran, B., Boyacı, M., Huber, B., Stolze, M. (2011): Report on evaluation of the revision of Reg. EEC 2092/91 import regime in two exporting non-EU countries (TR, CH) and on an international level. Deliverable 19 of the EU FP7 CERTCOST project, www.certcost.org.
- 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.
- Cen (1998). EN 45011: Allgemeine Anforderungen an Stellen, die Produktzertifizierungen betreiben. (ISO/IEC Guide 65: 1998) – deutsche Fassung (ICS 03.120.20).
- Dabbert, S. (2011). Improving the Organic Certifications system. Recommendations from the CERTCOST project. Deliverable 24 of the EU FP7 CERTCOST project, www.certcost.org.
- Darby M. Karni E. (1973). Free competition and the optimal amount of fraud. *Journal of Law and Economics* 16 (1):67–88.
- 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.
- European Commission (2010). An analysis of the EU organic sector. European Commission DG Agriculture and Rural Development, Brussels.
- European Commission (2011): Special Eurobarometer 342, Consumer empowerment, Brussels:

http://ec.europa.eu/consumers/consumer_empowerment/docs/report_eurobarometer_34_2_en.pdf , accessed on October 28, 2011.

- European Commission (n.d.). Report on the supervision of inspection bodies and authorities of the Member States according to Article 15 of council Regulation (EEC) No 2092/91 on organic production, year 2007. Brussels: European Commission. Gambelli, D. Zanoli, R., Solfanelli, F., Dabbert, S., Lippert, C., Zorn. (2012). Modelling of certification systems. Report on economic modelling results and actions to increase efficiency and cost-effectiveness of inspection procedures. Deliverable 20 of the EU FP7 CERTCOST project, www.certcost.org.
- 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.
- Golan, E., F. Kuchler, L. Mitchell and w.c.b.C.Green and A. Jessup (2001). Economics of Food Labelling. *Journal of Consumer Policy*, 24(2): 117-184.
- Janssen, M. and Hamm, U. (2011). Consumer Preferences and Willingness-To-Pay for Organic Certification Logos. Recommendations for Actors in the Organic Sector. Deliverable 17 of the EU FP7 CERTCOST project, www.certcost.org.
- Jespersen, L.M. (2011). Organic Certification in Selected European Countries: Control Fees and Size of the Sector. Deliverable 8 of the EU FP7 CERTCOST project, www.certcost.org.
- Lippert, C. (2005). Institutionenökonomische Analyse von Umwelt- und Qualitätsproblemen des Agrar- und Ernährungssektors. Kiel: Vauk.
- Lippert, C., Zorn, A., Dabbert, S. (2011). Heuristic Model for Optimising the Enforcement of Organic Farming Standards. Unpublished manuscript, Universität Hohenheim.
- Mattson, E. (2011). Congratulations to thirty CBs. The EU settles on the list of approved certification bodies. *The Organic Standard*. Issue 127, November 2011, p 1-2.
- Meinshausen, F., Förster, I., Rüegg, E., Bellière, S., Paluan, L., Peris, L., and Moschitz, H. (2011). Potential of alternative certification systems. Deliverable 21A of the EU FP7 CERTCOST project, www.certcost.org.
- Miran, B., Uysal, Ö. K., Abay, C., Boyacı, M., and Dabbert S. (2009). Stakeholders' views on improving the organic certification system: Results from an EU level workshop. Deliverable 2 of the EU FP7 CERTCOST project, www.certcost.org.
- Nelson, P. (1970). Information and Consumer Behavior. *Journal of Political Economy*, 78(2): 311-329.
- Padel S. (2010). The European Regulatory framework and it's Implementation in Influencing Organic Inspection and Certification Systems in the EU. Deliverable 11 of the EU FP7 CERTCOST project, www.certcost.org.
- Schmidt M.-J. and Janssen, M. (2010). Hochwertig muss hochpreisig sein. Spiegelt sich die besondere Qualität von Demeter-Produkten in Premium-Preisen wider? *Lebendige Erde*, 61. Jg., Nr. 1, S. 28-29.
- Stolze, M., Hartmann, M. and Moschitz, H. (2011). Report on total costs of three organic certification systems in seven European countries with particular focus on five organic supply chains. Deliverable 21B of the EU FP7 CERTCOST project, www.certcost.org.

CERTCOST: SYNTHESIS REPORT

- Willer, H. and L. Kilcher (Eds.) (2010). The World of Organic Agriculture - Statistics and Emerging Trends 2010. IFOAM, Bonn, and FiBL, Frick.
- Zorn, A., Lippert, C. and Dabbert, S. (2011). Analysis of risks for non-compliance regarding organic certification: categorical analysis of data from a German control body. Unpublished manuscript, Universität Hohenheim.
- Zorn, A., Lippert, C. and Dabbert, S. (2009). Economic Concepts of Organic Certification, Deliverable 5 of the EU FP7 CERTCOST project, www.certcost.org.
- Zorn, A., Lippert, C. and Dabbert, S. (2012 forthcoming). Supervising a system of approved private control bodies for certification: The case of organic farming in Germany. Food Control, 25(2), p. 525-532.

EU regulations and official notices

- Regulation (EEC) No 2092/1991 of 24 June 1991 on organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs.
- Regulation (EC) No 882/2004 of the European Parliament and of the Council of 29 April 2004 on official controls performed to ensure the verification of compliance with feed and food law, animal health and animal welfare rules.
- Council Regulation (EC) No 509/2006 of 20 March 2006 on agricultural products and foodstuffs as traditional specialties guaranteed.
- Council Regulation (EC) No 510/2006 of 20 March 2006 on the protection of geographical indications and designations of origin for agricultural products and foodstuffs.
- Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labelling of organic products and repealing Regulation (EEC) No 2092/91.
- Commission Regulation (EC) No 1235/2008 of 8 December 2008 laying down detailed rules for implementation of Council Regulation (EC) No 834/2007 as regards the arrangements for imports of organic products from third countries.
- Commission Regulation (EC) No 537/2009 of 19 June 2009 amending Regulation (EC) No 1235/2008, as regards the list of third countries from which certain agricultural products obtained by organic production must originate to be marketed within the Community.
- Commission Implementing Regulation (EU) No 590/2011 of 20 June 2011 amending Regulation (EC) No 1235/2008, laying down detailed rules for implementation of Council Regulation (EC) No 834/2007 as regards the arrangements for imports of organic products from third countries.
- Notices from Member States (2007). List of bodies or public authorities in charge of inspection provided for in Article 15 of Regulation (EEC) No 2092/91 (2007/C 35/04). Official Journal of the European Union C35 of 17.02.2007: 9-32.
- Notices from Member States (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). Official Journal of the European Union C72 of 26.03.2009: 25-49.

Database

- Organic Rules and Certification 2011. <http://www.organicrules.org/> accessed on September 22, 2011.