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Trust and E-Commerce in International Agri-Food Supply Networks

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Trust and E-Commerce in International Agri-Food Supply Networks

With a preface from Prof. Dr. Gerhard Schiefer

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Preface

The development and management of trade relationships are central functions in any economic activity. They involve the exchange of goods and the interaction between participating enterprises. With the increasing globalization of trade, the interaction between enterprises across borders, language barriers or cultural differences gets increasing attention as a critical success factor for competitiveness of industries.

This is especially relevant for industries where global trading activities between enterprises within a network of trading relationships is more the rule than an exception. The food sector with its need for global sourcing of products is one of the most global industries and very much dependent on the establishment of trade relationships beyond country borders.

Any options for improving the efficiency in the establishment and management of trade relationships is therefore of utmost interest to the industry. Proposals include the increased utilization of electronic commerce functionalities.

However, despite its need for such support, the food sector is one of the industries with the lowest utilization of information technologies. It has been argued that the trading of food products where many quality characteristics are difficult to communicate or identify through classical detection methods very much depends on trust between trading partners. There are sub-sectors where trade relationships have been in place for generations.

As a consequence it is argued that the utilization of electronic commerce systems for the establishment and management of trade relationships depends on the systems' ability to support the development of trust comparable to trust generating activities in classical trade relationships. An increase in the utilization of electronic commerce could not only contribute to trade efficiencies within enterprises but contribute to trade efficiency in the sector through increased utilization of spot markets and their flexibility.

Assuring trust in cross-country trade activities within electronic commerce environments is the challenge that has been taken up by this study. It is the basis for the utilization of modern communication technology with its promise of efficiency gains in the establishment and management of trade relationships in the global market place.

Bonn, July 29, 2010 Prof. Dr. Gerhard Schiefer

Trust and E-commerce in International Agri-food Supply Networks

Abstract

E-commerce offers opportunities for better competition by developing new products and markets, by bringing new actors onto the traditional markets and by developing new types of relationships between the traders. Additionally, using e-commerce, costs can be reduced and the satisfaction of the traders concerning faster delivery can be increased. Nevertheless, electronic transactions are not common in the agri-food sector compared with other businesses.

Every B2B relationship and also e-commerce starts with a first transaction. The initial transaction only takes place when the buyer's perceived trustworthiness of the supplier exceeds the buyer's perceived risks of the transaction. However, the challenge of the first transaction in e-commerce is how to communicate trust without any previous experience. Trust helps enterprises to trade across border and profit from the online environment, especially in the agri-food sector which deals with complex products due to different uncertainties and risks regarding the food quality and safety.

The main objective of this thesis is to analyse which elements of trust are essential in searching for a new international supplier and how these can be applied to e-commerce. To achieve this objective a stepwise approach has been developed by establishing the following phases: 1) identification of the most relevant trade flows; 2) exploration of trade relationships along the most relevant trade flows; 3) assessment of significance of traditional trust elements; 4) applications of traditional trust elements to e-commerce. The applications are determined by examining selected European (*Germany, Austria, Italy, Greece, Spain and Slovenia*) and cross-border (*USA, Brazil and Turkey*) agri-food chains (*cereals, meat, fruits and vegetables, and olive oil*) to contribute findings of possibly different cultural backgrounds. The identification of the most relevant trade flows (*step one*) is based on the statistical database and has been used as a basis for future research and to find out where the highest potential for the introduction of e-commerce in the international trade exists. The trade structures differed in the selected countries, and there is a complex picture. The *second step* has uncovered a predominance of long-term orientation of the international transactions' exchanges. The findings from the obtained results suggest that the request of the agri-food enterprises for more personal relations explains their need for trusted transactions. The key players in the agri-food sectors have been asked (*step three*) to determine the priority of trust-building elements which have been developed in the preceding work by using the AHP which appertains to the decision support system. Based on the determination that cultural background can have a significant influence on the formation of trust, the results from the selected countries have been compared. An obvious difference between northern and southern countries has been identified. The northern traders are classified as being focused on provable facts and control with respect to the "product" while the southern ones are more oriented to the relationship with the "seller". The *last step* has brought about results on what can be done to increase trustworthiness via B2B applications: like quality management certificates, specifications and warranties or a tracking & tracing system; these seem to be much better suitable than product pictures or market information. Proposals and first indications for trustworthines in B2B e-commerce as described in this thesis can be helpful within the traditional way of food transactions as a facilitator for food traders by accelerating the identification of new suitable suppliers.

VERTRAUEN UND E-COMMERCE IN INTERNATIONALEN LANDWIRTSCHAFTLICHEN VERSORGUNGSNETZWERKEN

Kurzfassung

Elektronischer Handel (E-Commerce) bietet Möglichkeiten für einen besseren Wettbewerb an, indem neue Produkte und Märkte entwickelt und neue Geschäftspartner ausserhalb des traditionellen Handels gewonnen werden können. Zusätzlich können Kosten durch E-Commerce verringert werden und die Zufriedenheit der Händler hinsichtlich der schnelleren Anlieferung erhöht werden. Dennoch sind elektronische Transaktionen in der Agrar- und Ernährungswirtschaft nicht so verbreitet wie in anderen Sektoren.

Jedes B2B-Verhältnis und auch E-Commerce beginnt mit einer ersten Transaktion. Diese erste Transaktion findet nur statt, wenn die Vertrauenswürdigkeit des Kunden bezüglich des Lieferanten die erkannten Risiken des Kunden übersteigt. Jedoch ist die Herausforderung der ersten Verhandlung im E-Commerce, wie man Vertrauen ohne irgendeine vorhergehende Erfahrung mitteilt. Vertrauen hilft den Unternehmen, grenzüberschreitend zu handeln und von der Online-Umgebung zu profitieren. Dies gilt besonders für die Agrar- und Ernährungswirtschaft, die sich mit komplexen Produkten aufgrund der verschiedenen Unsicherheiten und Risiken der Lebensmittelhygiene und -Sicherheit beschäftigt.

Die Hauptzielsetzung dieser Arbeit ist es, zu analysieren, welche Elemente des Vertrauens beim Suchen nach einem neuen internationalen Lieferanten wichtig sind und wie diese im E-Commerce angewendet werden können. Um diese Zielsetzung zu erzielen, ist eine schrittweise Vorgehensweise entwickelt worden, welche die folgenden Phasen beinhaltet: 1) Identifizierung der relevantesten Warenströme; 2) Erforschung der Geschäftsverhältnisse entlang der relevantesten Warenströme; 3) Bewertung der Wichtigkeit der traditionellen Vertrauenselemente; 4) Applikationen der traditionellen Vertrauenselemente im E-Commerce. Die Applikationen werden entwickelt, indem unterschiedliche ausgewählte europäische (*deutsche, österreichische, italienische, griechische, spanische und slowenische*) und grenzüberschreitende (*amerikanische, brasilianische und türkische*) Versorgungsnetzwerke (Getreide, Fleisch, Obst und Gemüse sowie Olivenöl) untersucht werden, um zusätzlich verschiedene kulturelle Hintergründe zu identifizieren. Die Identifikation der relevantesten Warenströme (*erster Schritt*), die auf statistische Daten basiert, dient als Grundlage für die zukünftige Forschung und dazu, herauszufinden, wo das höchste Potenzial für die Einführung von E-Commerce im internationalen Handel besteht. Die Geschäftsstrukturen unterscheiden sich in den ausgewählten Ländern, und es ergibt sich ein komplexes Bild. Der *zweite Schritt* stellt klar, dass überwiegend langfristige Geschäftsbeziehungen im internationalen Handel bestehen. Die Erkenntnisse aus den erzielten Ergebnissen zeigen, dass die Agrar-und Ernährungsunternehmen nach langfristigen Geschäftsbeziehungen suchen, die auf Vertrauensbasis gestaltet sind. Im *dritten Schritt* werden Schlüsselfiguren von Agrar-und Ernährungsunternehmen nach der Priorität der ausgewählten Vertrauenselemente befragt, die in der vorhergehenden Studie entwickelt worden sind. Die Bewertung dieser Vertrauenselemente wird durchgeführt, indem die AHP-Methode verwendet wird, welche zum Decision-Support-System gehört. Basierend auf Untersuchungen, dass der kulturelle Hintergrund einen bedeutenden Einfluss auf die Anordnung des Vertrauens haben kann, sind die Ergebnisse aus den verschiedenen Ländern verglichen worden. Ein offensichtlicher Unterschied zwischen den nördlichen und südlichen Ländern ist identifiziert worden. Die Nordhändler werden so eingestuft, dass sie sich auf nachweisbare Fakten und Kontrollmechanismen in Bezug auf das „Produkt“ fokussieren, während sich die südlichen mehr nach dem Verhältnis zum „Verkäufer“ orientiereren. Im *letzten Schritt* werden Ergebnisse erforscht, die weiterhelfen können, um die Vertrauenswürdigkeit über B2B Applikationen zu erhöhen, wie zum Beispiel Qualitätszertifikate, Spezifikationen und Garantien oder ein Rückverfolgbarkeitssystem. Wenn diese mit den Produktabbildungen oder der Marktinformation verglichen werden, haben sie eine höhere Bedeutung. Vorschläge und erste Ansätze für vertrauenswürdigen B2B E-Commerce, wie in dieser Arbeit untersucht, können hilfreich als Vermittler für Lebensmittelhändler durch die Beschleunigung der Identifizierung neuer geeigneter Lieferanten sein, innerhalb der traditionellen Art und Weise, um mit Lebensmitteln zu handeln.

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The road to this dissertation has been a personal challenge and an incredible experience. Although this final thesis reflects the work of one individual, it could not have been completed without the help and support of others. First and foremost, I am extremely grateful to my supervisor Professor Dr. Gerhard Schiefer for the opportunity to start this thesis and for his help, advice and guidance during my dissertation process. A very big thank you for the numerous discussions, patience and comments goes to PD Dr. Melanie Fritz. My appreciation is also extended to Professor Dr. Michael-Burkhard Piorkowsky for the assumption of the *co-referat*.

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To everyone, a heartfelt THANK YOU!

Bonn, in July 2010 Jivka Deiters

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LIST OF ABBREVIATIONS

A2A	Administration to Administration
A2B	Administration to Business
A2C	Administration to Consumer
AHP	Analytical Hierarchy Process
B2A	Business to Administration
B2B	Business to Business
B2C	Business to Consumer
BMELV	Federal Ministry of Food, Agriculture and Consumer Protection
BRC	British Retailers Consortium
BRC	British Retailers Consortium
BVE	Federation of German Food and Drink Industries
C2A	Consumer to Admisitration
C2C	Consumer to Consumer
DBB	German brewer's association
EDI	Electronic Data Interchange
EFS	Enterprise Feedback Suite
EU	European Union
Eurostat	European Statistics Agency
F&B	Food and Beverage
FAO	Food and Agriculture Association
FAOSTAT	Food and Agricultural Organization, Statistical Database
FCM	Food Chain Management
GMP	Good Manufacturing Practice
HACCP	Hazard Analysis Critical Control Points
ICT	Information and Communication Technology
IFS	International Food Standard
ISO	International Standard Organization
IT	Information Technology
LLC	Limited Liability Company
QS	German quality management system
SBA	Federal Statistical Office, Germany
SC	Supply Chain
SCM	Supply Chain Management
SCR	Supply Chain Relationships

SME	Small or Medium-sized Enterprise
TCE	Transaction cost economics
TCT	Transaction Cost Theory
TF	Trade Flows
TR	Trade Relationships
VdF	German Fruit Juice Industry Association
VDF	Organisation of meat's economy
ZMP	The central market and price report place LLC, Bonn / Germany

1 INTRODUCTION

1.1 Problem Statement

Electronic commerce or e-commerce is expanding rapidly and continuously as a means of doing business via Information and Communication Technologies (ICT). In recent years, there have been a large number of changes in the areas of e-commerce and international trade. The definition of e-commerce is very broad, and advantages and disadvantages of it denote different effects to different people. This perception depends on the individuals, their circumstances and the goods that are to be traded (WHITELEY 2000). However, it can be described as any form of economic activity conducted via electronic connections (WIGAND 1997, PICOT ET AL. 2003). The spectrum of e-commerce ranges from electronic markets to electronic hierarchies and also incorporates electronically supported entrepreneurial networks and cooperative arrangements (WIGAND 1997). By using e-commerce, firms can easily reach new markets and new customers with minimal capital investment, so that they can increase their revenues and coordinate supply chains across borders (CAVUSGIL 2002, WILLIAMS ET AL., 2001, GLOBERMAN ET AL., 2001). E-commerce stimulates competition by developing new products and markets, by bringing new actors onto the traditional markets and by developing new types of relationships between the traders. They can also reduce their costs by improving the quality of their products and services with the help of an increase in efficiency (STEINFIELD AND KLEIN 1999, MANN ET AL. 2000, WILSON AND ABEL 2002). E-commerce offers opportunities to enhance trade relations or provides buyers' satisfaction and creates many potential benefits to organisations, individuals, and society (TURBAN ET AL. 2000).

Although the online environment offers the benefits mentioned above and acts as a driver of change, it can be said that the agri-food sector maintains a low level of ICT when compared to other manufacturing businesses, even though it has a relevant role in the European economy (EUROPEAN COMMISSION 2007, SEE ALSO FRITZ AND HAUSEN 2008). The agri-food sector can be characterised as a "*complex, global and dynamically changing network of trade streams, food supply network relations and related product flows*" (FRITZ AND SCHIEFER 2008). The literature often uses the term supply network instead of supply chain. This compatibility of supply chain and supply network can be substantiated since an enterprise does not usually have only one supplier and one purchaser, but sustains various relationships with several members of the chain (KUHN AND HELLINGRATH 2002, BUSCHER 2003, SYDOW 2006). Hence, the terms supply chain and supply network are used synonymously in this thesis.

LEROUX ET AL. (2001) provide, similar to the statement above, three factors which impact on the development of the food sector: (1) industry structure, (2) product complexity, and (3) high-touch nature of transactions (LEROUX ET AL. 2001). Especially in the agri-food sector, business as usual has changed lately, and the traders no longer focus on the four P's (product, price, place and promotion), but are more keen on: traceability, reliable supply and long term relationships (SKYTTE AND BLUNCH 2001). Overall, a plethora of studies show that buyers of the agri-food sector in particular are not reacting as flexibly in searching and switching to new suppliers as expected (EUROPEAN COMMISSION 2007). In addition, the consumers' perception of quality regarding the agri-food products is a dynamic variable and is difficult to scrutinize (FRITZ AND SCHIEFER 2008,

FRITZ AND CANAVARI 2007). This is even more relevant if the business partner is located in a foreign country. Based on the difficulty of defining the agri-food quality, the transactions of the agri-food products occasion an information asymmetry, risks and insecurity for the enterprises. It is without a doubt that information, mechanisms of control and safeguard opportunities (e.g. quality certificates) can facilitate the transmission of the agri-food goods (KRIEGER AND SCHIEFER 2007, KRIEGER 2008). A crucial complement and on occasion compensation for control and safeguard mechanisms in transactions is trust (FYNES ET AL. 2001). Trust is a complex concept that has been studied by many disciplines, such as sociology, psychology and business sciences, among others. Trust between participants of different levels of the supply chain is a very important driver for good relationships and successful chain co-ordination (JACK ET AL. 1998, SCHIEFER 2002, HORNIBROOK AND FEARNE 2005). Trust can be defined as "*the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party*" (MAYER ET AL. 1995). In particular, researchers who study trust in business relationships note that high levels of trust facilitate increased competitive advantages, enhance satisfaction, develop long-term relationships, reduce risks, and encourage large investments (BARNEY AND HANSEN 1994, GANESAN 1994, KUMAR 1996, ZAHEER ET AL. 1998). Since trust has been related to successful buyer-seller relationships (DONEY AND CANNON 1997), the role of business-to-business (B2B) e-commerce and trust formation mechanism has newly become of fundamental importance (PALMER ET AL. 2000).

Online trust basically refers to trust in a virtual environment, e.g. e-commerce (MCKNIGHT ET AL. 2002B). In an e-commerce environment, trust is more difficult to build and even more critical for success than in traditional commerce (HODGES 1997, RATNASINGHAM 1998, HOFFMAN ET AL. 1999, ROY ET AL. 2001). Trust is a long-term proposition that may be tough to build and easy to lose. Overall, the Internet and e-commerce in particular, is not a familiar environment where the companies blindly place their trust. When compared with traditional trade, e-commerce is more impersonal, more automated, requires more legal uncertainties, and presents more opportunities for cheating (GÖRSCH 2001, HEAD ET AL. 2001, ROY ET AL. 2001, YOON 2002). Therefore trust is more difficult to build in this online environment (HOFFMAN ET AL. 1999). In general, several surveys have shown that a lack of trust is still one of the biggest worries in internet usage (FRITZ 2007B, FRITZ ET AL. 2007, FRITZ AND HAUSEN 2008). Hence, in the case of cross-border trade, a very important reason seems to be the lack of trust in electronic trade procedures (TAN AND THOEN 2001). In addition, a very specific problem in e-commerce is namely how to build online trust between trading partners that have never traded before, the so-called first transaction in which no experience is available (TAN 2003, FRITZ ET AL. 2007).

Overall, without trust, development of e-commerce cannot reach its full potential. In the agri-food sector the adoption of e-commerce activities is very slow, due to the peculiarities of agri-food products (FRITZ 2007B) and cultural factors. The culture, e.g. culturally influenced tolerance of uncertainties, can be relevant for trust formation (HOFSTEDE 2006, HOFSTEDE ET AL. 2007).

However, there is still a great deal of optimism about the potential success of e-commerce in agriculture (LEROUX ET AL. 2001).

1.2 Research Objectives

The real challenge of the problem with the first transaction in e-commerce is how to communicate trust without any previous experience which helps enterprises to trade across borders and profit from the online environment especially in the agri-food sector which deals with complex products due to different uncertainties and risks regarding the food quality and safety.

Based on the statement of the barriers by the adoption of e-commerce, the primary objective of this thesis is to analyse which elements of trust are essential in searching for a new international supplier and how these can be applied / illustrated in e-commerce. This will, in turn, increase the awareness of e-commerce for agri-food sector and improve the competitiveness of the European agri-food sector.

In order to achieve the above-stated objective, a stepwisse approach is developed to give answers to the following research questions:

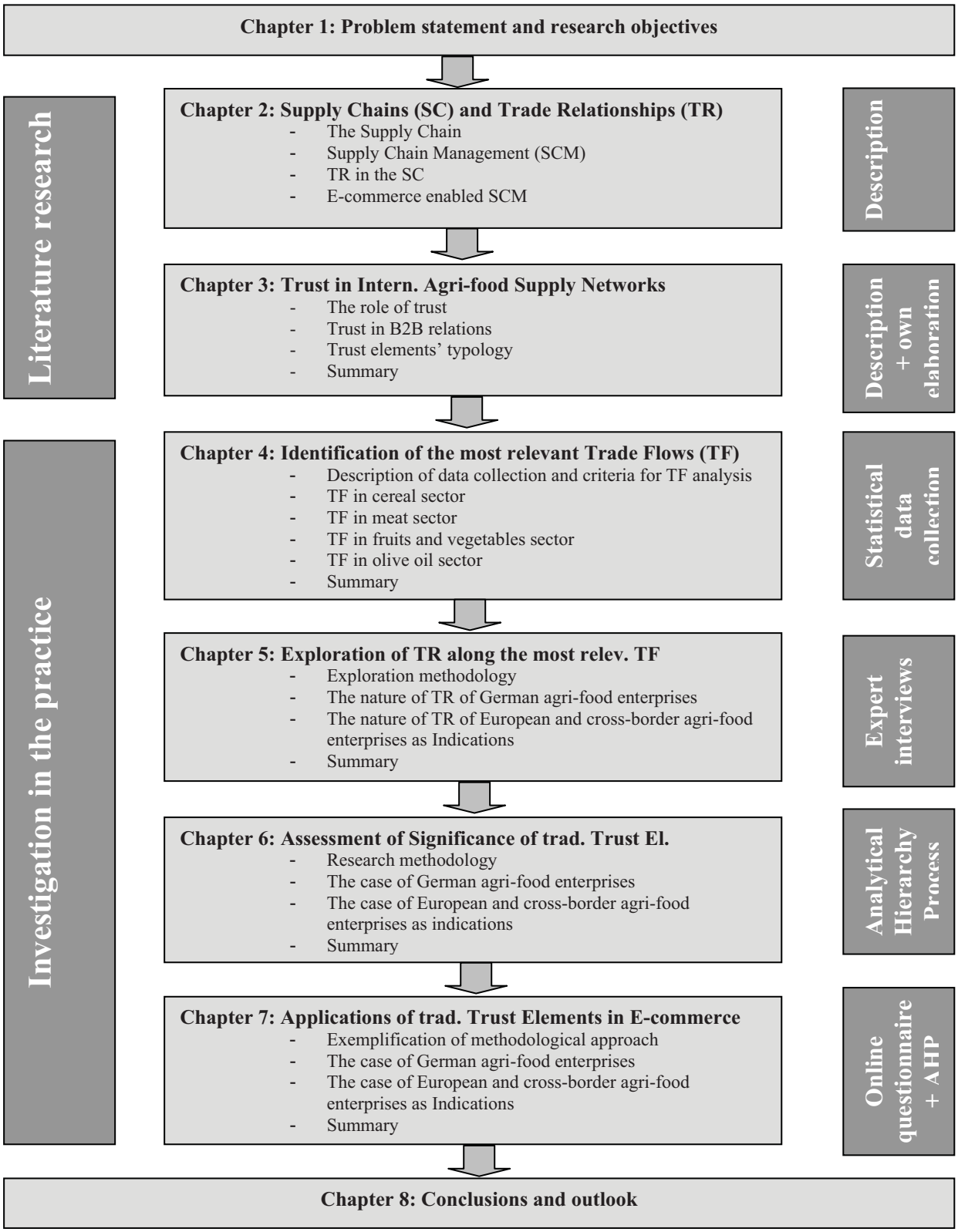
- Where does the highest potential exist for new trade partners regarding the international trade flows?
- What nature of trade relationships can be identified in the most relevant international trade flows?
- Which elements of trust have an impact on the buyers' decision for the occurrence of cross-border transactions?
- What are the most essential elements of trust that influence the buyers' decision to engage in cross-border transactions along the examined agri-food chains and for different cultural backgrounds?
- Which electronic features can correspond to the identified most essential elements of trust?

To contribute findings of possibly different cultural backgrounds, four agri-food supply networks (cereals, meat, fruits and vegetables, and olive oil) within six European (Germany, Austria, Italy, Greece, Spain and Slovenia) and three cross-border countries (USA, Brazil and Turkey) are selected and examined.

1.3 Structure of the Thesis

The current Chapter 1 provides the problem statement which points out the relevance of the thesis, the research objective which presents the objective of the thesis and finally the outline which explains the structure of this thesis. In Figure 1-1 an overview on the structure of the thesis and the individual steps of the approach is presented.

Figure 1-1: Structure of the thesis



Source: Own elaboration

Following the introduction of the thesis (Chapter 1), a review of the relevant literature is provided in ***Chapter 2***. In this section the concepts of "Supply Chain", "Supply Chain Management" and the "Supply Chain Relationships" are approached in-depth, in order to identify their role and importance in the current research topic. Finally, in Chapter 2 the opportunities of e-commerce for effective and efficient SCM are investigated.

Chapter 3 focuses on the understanding of trust and its importance for the relationships in the supply networks. A literature research provides information on the role of trust and from different points of view, e.g. its implication in agri-food sector and across the cultures. Different models of trust are illustrated additionally, and an in-depth study of the trust's elements typology by HOFSTEDE ET AL. (2007) is supplied in order to provide a basis for the further approach in this thesis.

In ***Chapter 4*** statistical data on international trade flows from and to selected countries along four agri-food sectors is observed. The goal of this investigation is to discover, which are the most relevant import and export products on the different supply chain levels, in order to identify the highest potential for new traders with respect to the international exchange. In this chapter, first the methodology is explained, and afterwards the obtained findings are described.

Chapter 5 provides findings on the nature of the trade relationships along the most relevant trade flows which are identified in the preceding chapter. This elaboration is important to understand if the international exchange is based more on long-term relationships with existing trust or more on spot market relationships where the traders do not know each other beforehand and there is an inherent lack of trust. This elaboration is provided for Germany; the findings are presented in detail. While a similar process is attempted for selected other countries, the findings are of lesser quality due to the smaller number of results and can therefore only be used as indications.

The objective of ***Chapter 6*** is to evaluate the individual priority of agri-food experts with respect to determined trust-building elements from Chapter 3. An appropriate decision support system, in particular the Analytical Hierarchy Process (AHP) is used for research evaluation. The methodology is defined at the beginning of the chapter. Next, the results for the German agri-food enterprises are presented. Then the evidence of the European and cross-border enterprises is obtained, which can be used as indications.

Chapter 7 involves the examination of the applications in e-commerce which can be transmitted from the gained trust elements in the traditional trade (see Chapter 6). As shown before during the literatures research (see Chapters 2 and 3), the ability of e-commerce and internet technologies to facilitate the traditional "face-to-face" initiation of business have been discussed. However, online transactions are generally characterised by the very absence of such a "face-to-face" situation. Therefore appropriate tools have to be employed to overcome this difficulty,

such as synchronous audio-visual communication tools. Based on this background, the focus of Chapter 7 is to reseach what electronic features can correspond to the identified most essential elements of trust. The results of this research can be used as indications in the different agri-food chains and countries due to the fact that the analysis is done in several European states and cross-border.

At the end the conclusions of the thesis are provided in ***Chapter 8*** and an outlook for future research is presented.

2 SUPPLY CHAINS AND TRADE RELATIONSHIPS

The previous chapter provides an overview of the thesis, lists the objective, issues, and significance of the research topic and also the approach for achieving the main goal.

This chapter reviews the relevant literature and comprises four sections. The review starts with fundamental definitions and features of the concepts of "Supply Chain" (SC) and "Supply Chain Management" (SCM). This is followed by the discussion on approaches to understanding the supply chain in-depth, in particular their classification, actors, flows and networks. Next, the key issue related to the Supply Chain Relationships (SCR) and factors influenced these is discussed. After this, focus is shifted to e-commerce as an enabler to SCM, what kind of opportunities there are, their benefits and whether barriers to the adoption exist (see Figure 2-1).

Figure 2-1: Overview of Chapter 2 "Supply Chains and Trade Relationships"

Source: Own elaboration

2.1 The Supply Chain (SC)

2.1.1 Definitions and objectives

There are numerous definitions for a Supply Chain (SC) and Supply Chain Management (SCM). The definition often reflects the field from which the question is approached. For example, a manufacturing-oriented view will emphasise different points from a marketing-oriented view. A reasonable neutral definition for a Supply Chain has been presented by ELLRAM (1991):

"A network of firms interacting to deliver a product or service to the end customer, linking flows from raw material supply to final delivery".

LEE AND BILLINGTON (1995) have a similar definition:

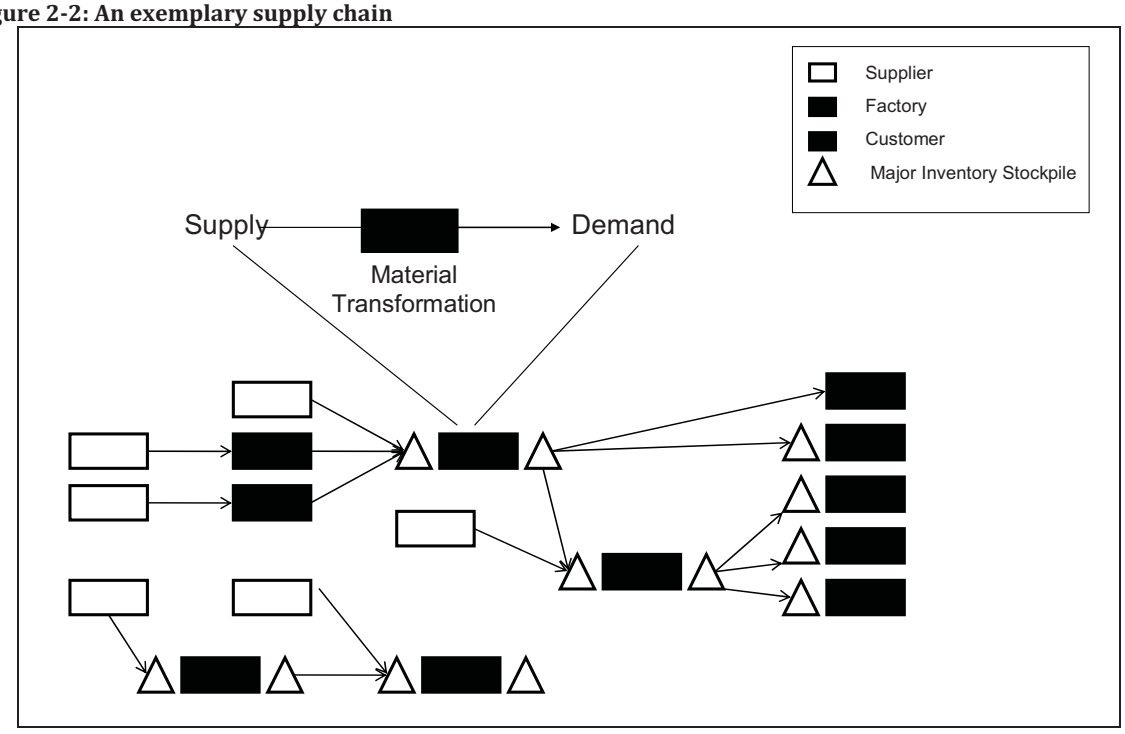
"A supply chain is a network of facilities that procure raw materials, transform them into intermediate goods and then final products, and deliver the products to customers through a distribution system".

A supply chain has been defined as: *"A set of three or more entities (organization or individuals) directly involved in the upstream and downstream flows of products, services, finances, and/or information from source to a customer"* (MENTZER ET AL. 2001).

STEVENS classifies a supply chain as *"... a connected series of activities which is concerned with planning, coordinating and controlling materials, parts, and finished goods from supplier to customer. It is concerned with two distinct flows (material and information) through the organization"* (STEVENS 1989).

GANESHAN ET AL. have yet another analogous definition: "*A supply chain is a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers*" (GANESHAN ET AL. 1995). The Figure 2-2 depicts an exemplary supply chain with all its components.

Figure 2-2: An exemplary supply chain



Source: Stadtler 2005

The classification of supply chain, its actors and what it consists of, will be further analysed later in this chapter.

The first step in managing the supply chain, as well as studying the relationships within, is to map the supply chain structure (LAMBERT 2006). The outline of this subsection is as follows: Supply chain classification – here the attributes of the supply chain are listed. After this, the basic building blocks of the supply chain are defined. In the definitions below, these blocks are termed entities, organisations, networks, and individuals. The connections between the blocks

are termed linkages or relationships. Then the direction and its meaning of the supply chain flows is shown, followed by an explanation of the supply chain network.

2.1.2 Classification of Supply Chain

A supply chain can be classified on the basis of typological features and their characteristics. The following features and characteristics given by BUSH AND DANGELMAIER (2002) present an overview of the broad potential of a supply chain classification (see Table 2-1):

Table 2-1: Classification of supply chain

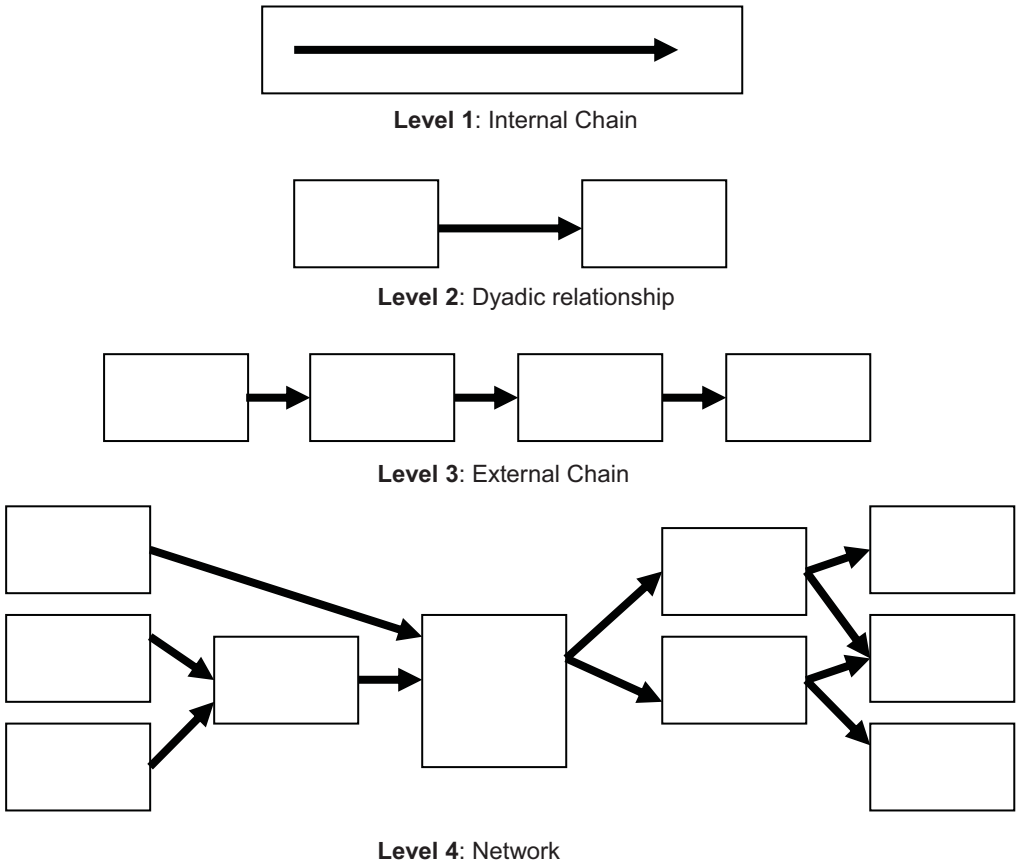
Attribute	Attribute's characteristic
Cooperation's item	procurement
	production
	sales
	research and development
Cooperation's direction	horizontal
	vertical
Partner's size	homogeneous
	inhomogeneous
Coordination's direction	hierarchical
	heterarchical
Origin	local
	regional
	national
	global
Nature of state of competition	single
	double
	multiple sourcing
Time perspective	short
	medium
	long term
Relationships	informal
	contracted
Trust	low
	medium
	high

Source: Own elaboration, based on Busch and Dangelmaier 2002

This is however not the only available supply chain classification. Even though most supply chain classifications originate from the management of supply chains, the same system levels are relevant when determining the scope of supply chain interaction in accordance with CHRISTOPHER (2005). This is consistent with the definition by MENTZER ET AL. (2001), stating that supply chains are simply something that exists, while supply chain management requires clear management efforts by the organisations within the supply chain.

When taking the research approach to supply chains, HARLAND (1996) has suggested the division of Supply Chain research into four levels of complication as illustrated in Figure 2-3.

Figure 2-3: Four levels of research in Supply Chain Management



Source: Harland 1996

The levels are according to HARLAND (1996):

- Level 1: The internal chain;
  The *internal supply chain* that integrates business functions involved in the flow of materials and information from the inbound to outbound ends of the business is regarded as the first level.The inter-organisational relations can then be divided into three different levels:
- Level 2: The dyadic or two party relations;
- Level 3: The external chain where the supplier, the supplier's suppliers, the customer, and the customer's customers are included, i.e. a set of dyadic relations;
- Level 4: The network of interconnected chains.

The levels describe Supply Chain integration and Supply Chain Management as the management of supply relationships. This means that Supply Chain Management is not restricted to the management of the material flows. The management of information flows becomes more important as the complexity of the structure increases.

2.1.3 Actors in a Supply Chain

According to LAMBERT ET AL. (1998), a supply chain consists of the network of members, and the links between members of the supply chain. HARLAND (1996) on the other hand defines a supply

chain network as comprised of a set of persons, objects or events, called actors or nodes. Within the industrial network approach actors, activities, and resources are identified (HAKANSSON AND SNEHOTA 1989, HAKANSSON AND JOHANSSON 1992). Most authors agree that the basic building blocks of a supply chain are the nodes and the arcs between the nodes; the problem however is to agree on what these nodes and arcs represent. There is hence a need for defining these components of the supply chain further.

The nodes have previously been defined as different companies (LAMBERT ET AL. 1998), different organisations (HAKANSSON AND SNEHOTA 1989, CHRISTOPHER 2005), different geographical locations (FERDOWS 1997) or different entities (organisations or individuals) (MENTZER ET AL. 2001). The term 'actor' could hence be used if the content of an actor is defined. Each actor is thus here defined as a specific set of resources, regardless of ownership, location etc.

The arcs in the supply chain structure have previously been defined as process links (LAMBERT ET AL. 1998), as relationships (HAKANSSON AND SNEHOTA 1989, CHRISTOPHER 2005), as linkages with processes and activities (CHRISTOPHER 1992), or as flows of products, services, finances, and information (MENTZER ET AL. 2001).

The arcs in the supply chain are defined in this thesis as the relations between the actors.

An in-depth approach of the relationships between the actors in the supply chain will be presented in section 2.3.

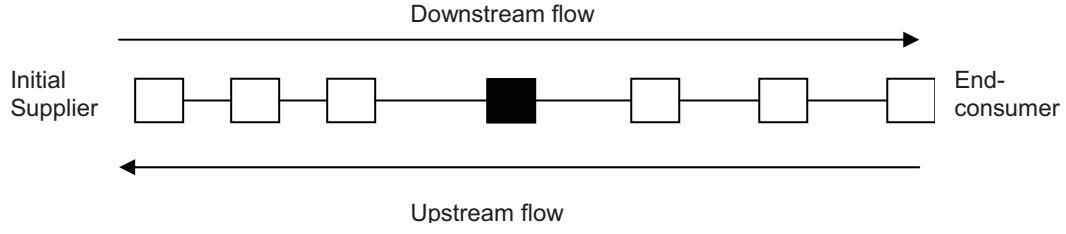
2.1.4 Supply Chain Flows

The actors in a supply chain exchange materials, products, services, money, and information to create value for the end-customer. The direction of this flow is called the upstream or the downstream flow and usually refers to the direction of flow from the focal company's point-of-view (CHRISTOPHER 1998).

The **upstream** flow mainly consists of information and finances but also products or material in the form of returns. The **downstream** chain, or the distribution channel, consists of the focal firm's customers and their customer's customer. The main content of the downstream flow is the flow of products or material, even though the flow of information is also important.

A typical supply chain and its relationship between upstream and downstream actors are shown in Figure 2-4. As the figure shows, consumers demand products, and in order to satisfy these demands, multinationals source products through a vendor or middleman or purchase directly from contracted suppliers (CHRISTOPHER 1998).

Figure 2-4: The up/downstream flow of a supply chain



Source: Christopher 1998

2.1.5 Supply Chain Networks

Networking is a cooperation between business partners in horizontal and vertical chains. The networking concept is used when there are more than two cooperative partners.

A supply chain network is defined as a network of connected and interdependent organisations mutually and co-operatively working together to control, manage and improve the flow of materials and information from suppliers to end users (CHRISTOPHER 1998.).

In the literature the term supply network is often used in place of supply chain (KUHN AND HELLINGRATH 2002, SYDOW 2006).

This change of the object's view from supply chain to supply network can be justified according to BUSCHER (2003) because individual enterprises usually not only have a single supplier and a single purchaser, but maintain various relationships with several members of the chain. Thus it seems that the term supply chain may be replaced by the term supply network.

Research often focuses on supply chains as connections between exactly one seller and exactly one buyer due to the simplicity of the concept and analytical tractability. This restriction often suffices for achieving the research goals.

However, real business interactions often occur in network structures rather than in a chain of buyers and sellers for several reasons:

- Multiple links may enable the pooling of risks;
- Buyers may share sellers to ensure that sellers have sufficiently high demand to cover investment costs;
- More links may enable access to a variety of goods;
- Sellers may have economies of scope or scales, if they have multiple buyers;
- Possible advantages of diversity and potential future benefits, e.g. buyers could take advantage of sellers investigating different technologies;
- Overcoming threshold values in a certain field that is impossible to overcome with one link (e.g. in many environments, a firm's gain of adopting a technology may depend on others adopting this technology).

Subordinately, the term network in practice is more applicable to nonlinear relationship points, while the terminology supply chain implies linearity between the individual enterprises, because enterprises in SCs cannot be regarded in an isolated manner. The enterprises are affected by other enterprises and vice versa (CHAIB-DRAA 2006). Co-operations in the supply chain allow these interactions for all enterprises to be arranged optimally, i.e. the interests of all cooperation partners in the SC are well-known and considered.

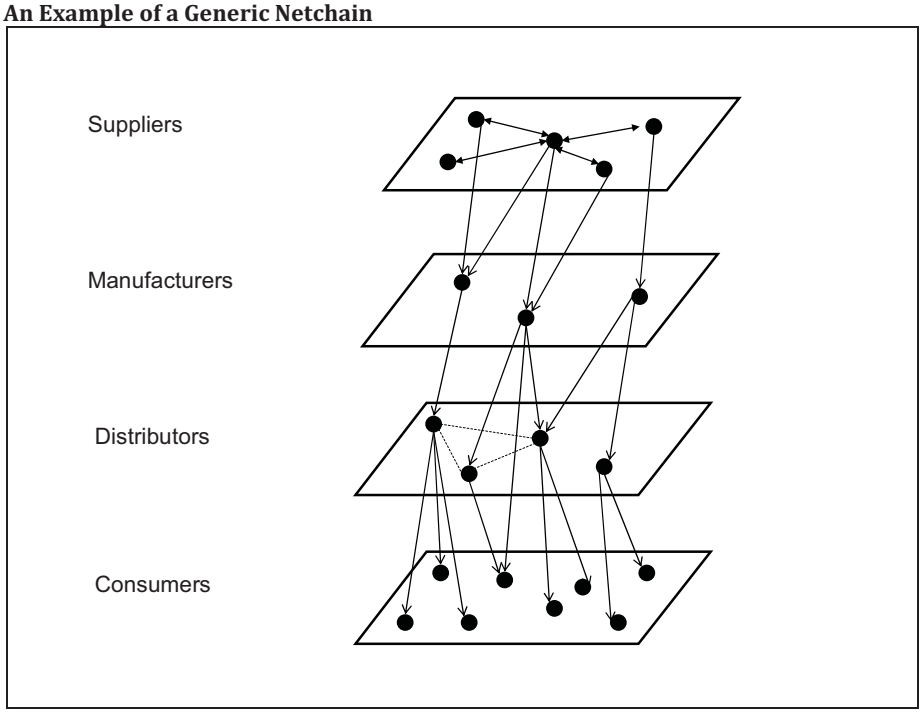
"A supply network is a group of buyers, sellers, and the pattern of the links that connect them, where a 'link' is anything that makes possible or adds value to a particular bilateral exchange" (KRANTON AND MINEHART 2001).

Instead of the linear and unidirectional model describing supply chains, the supply chain network concept includes and describes lateral links, reverse loops, two-way exchanges etc. This corresponds to Harland's system level four (see also section 2.2.1).

In a similar manner, LAZZARINI ET AL. (2001) describe that supply chains are not really linear chains but most often expansive networks (LAZZARINI ET AL. 2001) and introduce the concept of

netchain – a set of networks comprised of horizontal ties between firms within a particular industry or group, such that these networks (or *layers*) are sequentially arranged based on the vertical ties between firms in different layers (Figure 2-5). Netchain analysis explicitly differentiates between horizontal (transactions in the same layer) and vertical ties (transactions between layers), mapping how agents in each layer are related to each other and to agents in other layers.

Figure 2-5: An Example of a Generic Netchain



Source: Lazzarini et al. 2001

2.1.6 International Supply Chain

International trade is determined by natural and cost-related reasons. The natural reason for international trade is the absence of one or more factors of production (nature, labour, knowledge and capital) for the production of a particular good in one country. At this point it is important to mention that not only the lack of production factors, but also the over-supply of raw materials, semifinished and finished products is a natural reason (KAMINSKI ET AL. 2006).

Cost and price advantages are another reason for international trade. Some products can be produced cheaper abroad than in one's own country, and vice versa cost advantages in one's own country make other products more attractive to foreign demand. Cost differences arise in terms of quantity and quality of factors of production (KAMINSKI ET AL. 2006). According to the theory of absolute cost advantage, based on Adam Smith, goods will be exported if they are cheaper inland than abroad. On the other hand, goods are imported if they are cheaper abroad than inland (ANDEREGG 1999).

The international supply chain equates to the national or regional supply chain. The only difference is that the international supply chain goes beyond national borders and acts in a larger geographical area. The regional supply chain with some foreign partners can contribute to

an international supply chain that will be extended to an integrated global supply chain (SIMCHI-LEVI 2003).

The international supply chain is in contrast to the national supply chain associated with a greater number of activities that are brought about by many people of different nationalities. Within the international supply chain activities are in particular dependent on international trading conditions, the nature of the product and cultural characteristics of the trade relationship in the related countries (CARL 2003). The trade partners of the international supply chain work in a dynamic environment with often varying requirements (SCHARY AND SKJOTT-LARSEN 2001).

2.2 Supply Chain Management (SCM)

The following section introduces different current perceptions and definitions of SCM, as a variety of ideas and understandings about SCM exists. The SCM in the agri-food sector and on the international level are further examined.

The term "Supply Chain Management" (SCM) was originally introduced by OLIVER AND WEBBER in the early 1980s (OLIVER AND WEBBER 1992) and has since gained currency and constantly increasing importance (WERNER 2000). The changes from seller's to buyer's markets and rising complexity and dynamics of the basic conditions are assumed to be the main causes for this approach (KUHN AND HELLINGRATH 2002, BERENTZEN 2000).

Before analysing the concept of SCM and its application, it is of importance to present the objectives of the SCM function. The following subsection provides the objectives of SCM.

2.2.1 Definitions and objectives

The definitions of Supply Chain Management often overlap with those of modern definitions of logistics (LAMBERT 2006). The key difference is perhaps that definitions of SCM that do not come from a logistics background take a more holistic approach and the emphasis is on a network rather than on a single company. This single company approach can be seen, for example, in the definition of Logistics by CHRISTOPHER (1998).

Based upon definitions of different authors, Table 2-2 should impart a sense of the impact of the large spectrum of SCM.

Table 2-2: SCM definitions (sorted by year)

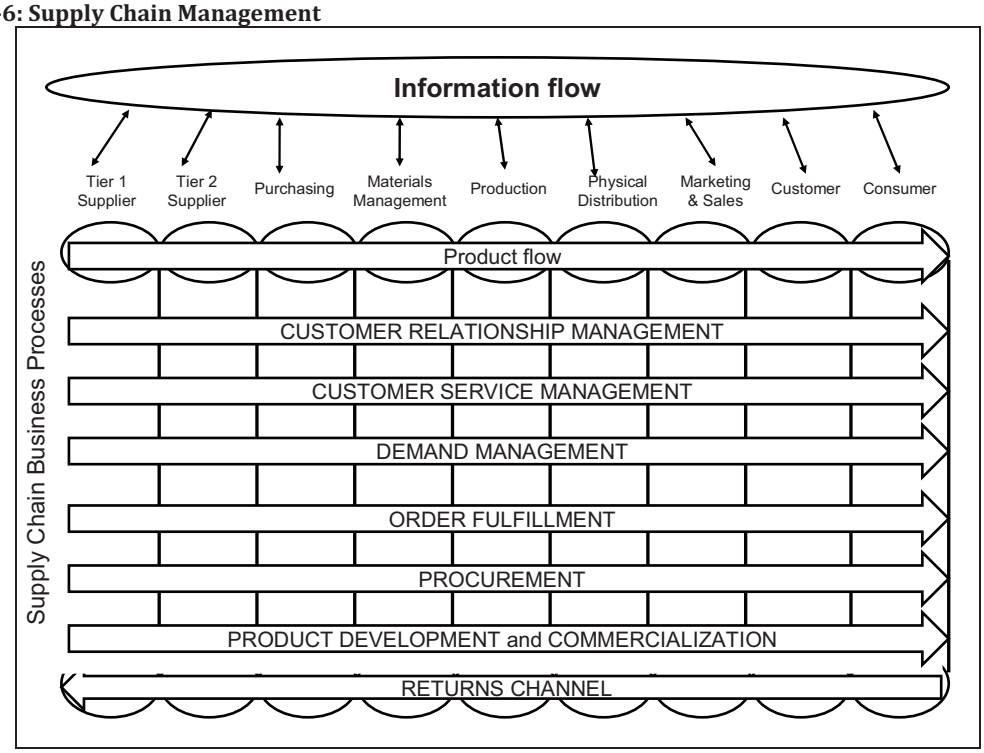
Author(s)	Definition
Christopher (1992), p. 24	"Network of organisations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ulitmate customer"
Bowersox and Closs (1996), p. 4	"The basic notion of supply chain management is grounded in the belief that efficiency can be improved by sharing information and by joint planing … an overall supply chain focussing on integrated management of all logistical operations from original supplier procurement to final consumer acceptance"
Cooper et al. (1997), p.2	"The integration of business processed across the supply chain is what we are calling supply chain management"
Van der Horst (2000), p.26	"SCM is the integrated planning, co-ordination and control of all logistical business processes and activities in the SC to deliver superior consumer value at less cost to the SC as a whole whilst satisfying requirements of other stakeholders in the SC"
Mentzer et al. (2001), p. 18.	"SCM is the systematic, strategic coordination of the traditional business functions and the tactics across [these] business functions within a particular company and across businesses within the supply chain, for the purpose of improving the longterm performance of the individual companies and the supply chain as a whole."
Kuhn and Hellingrath (2002), p. 10	"SCM is the integrated, process-oriented planning and management of material, information and financial flows along the entire value chain; from the customer to the supplier of raw material […]."
Simchi-Levi et al. (2003), p. 2	"SCM is the process of planning, implementing and controlling the efficient, cost effective flow and storage of raw materials, in-process inventory, finished goods, and related information from point-of-origin to point-of-consumption for the purpose of conforming to customer requirements."
Göpfert (2004), p. 32	"SCM is a modern concept of company networks to exploit inter-company success potentials by means of R&D, design and steering of effective and efficient material, information and financial flows."
Busch and Dangelmaier (2004), p. 8	"SCM is the inter-company coordination of material and information flows among the entire value creation process – from raw material over the individual processing steps to the end consumer – with the goal to optimize the entire process in terms of time and cost aspects."

Source: Own elaboration

After the multiplicity of definitions has been described, SCM can be understood as „an integrative overlapping governance and organisation of the whole process chain resp. the supply chain levels" (BERENTZEN 2000).

Figure 2-6 shows the broader spectrum of the SCM, which depicts a simplified supply chain network structure, the information and product flows, and the key supply chain business processes (COOPERT ET. AL 1997).

Figure 2-6: Supply Chain Management



Source: Coopert et. al 1997

The SCM aims at an optimization of the whole supply chain (BUSCH AND DANGELMAIER 2004). The assumed optimization of the overall system is more efficient than optimizing isolated subsystems (KUHN AND HELLINGRATH 2002). In other words, it aims to link all the supply chain agents to jointly cooperate within the firm as a way to maximize productivity in the supply chain and deliver the most benefits to all related parties (FINCH 2006). Furthermore, (MENTZER 2001) the significant importance of SCM as "*the systematic, strategic coordination of the traditional business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long term performance of the individual companies and the supply chain as a whole*".

Efficiency and speed are frequently mentioned as principal purposes of the optimization measures, which can be differentiated in the following partial goals (CHAIB-DRAA 2006, GÖPFERT 2004, VAHRENKAMP 2000):

- An increase of turnovers with at the same time better net yields;
- A minimization of total SC costs;
- A higher efficiency of cross-company production control and capacity planning;
- A global view on available existence and resources;
- An improved utilization of capacity;
- A dismantling of stocks;
- An increase of the deliverer's willingness.

2.2.2 SCM in Agri-Food Business

In the following section developments and characteristics of the SCM in agri-food supply chains (Food Supply Shain) are represented.

Food supply chain management covers the management of the food supply system from the farm to food manufacturing, to retail and wholesale markets, and to consumer issues (BOURLAKIS AND WEIGHTMAN 2004, EASTHAM ET AL. 2001). Regarding food chain safety and quality, LUNING ET AL. (2002) also mention that food quality management must attain quality and safety standards stemming from customers' requirements and expectations. These requirements and expectations are transformed into the company's performance quality objectives. To implement these objectives, partnership relationships between food companies and their chain actors and even with loyal customers are crucial.

Several authors (VAN DER VORST 2000, VAN DER SPIEGEL 2004) have summarized the following specific aspects of agri-food supply chains:

1. Shelf life constraints for raw materials and perishability of product, intermediates and finished products and changes in product quality level progressing the supply chain (decay);
2. Long production throughput time (production of new or additional products requires a long time);
3. Seasonality in production;
4. Seasonal supply of products requires global sourcing;
5. Requires conditioned transportation and storage;
6. Variable process yield in quantity and quality due to biological variations, seasonality, factors connected with weather, pests and other biological hazards;
7. Storage buffer capacity restrictions, when materials or products can only be kept in special containers;
8. Governmental rules concerning environmental and consumer-related issues (CO2 emission, food safety issues);
9. Physical product features: e.g. sensory properties such as taste, odor, appearance color, size and image;
10. Additional features: e.g. convenience of ready-to-eat meals;
11. Product safety: increased consumer attention concerning both product and method of production. No risks for the consumer of foods are allowed;
12. Perceived quality: is also relevant for food applications. For example advertisement or brands (marketing) can have considerable influence on quality perception.

FRITZ AND SCHIEFER (2008) describe the problems the food sector has to cope with as rapid adaptation to changing scenarios, coverage of sector's structures where the SMEs are prevailing, different consumer needs that are changing continuously.

The challenge for Food Chain Management (FCM) is to integrate and balance the interests of all stakeholders including enterprises, consumers, and the society as a whole, considering all of the relevant factors for successful integration including economic efficiency, environmental control, social responsibility, fitting process organisation, food safety, marketing, or transaction rules, and so on (FRITZ AND SCHIEFER 2008).

The food sector faces three strategic developments regarding its production base that put pressure on its capacity to deliver the necessary food supply: 1) increasing demand for bio-

energy, 2) limits in the availability of water, and 3) diminishing production resources. In addition, food production will be affected by pressure from a growing world population and the desire for an increased consumption of meat. Possible changes in climate might aggravate the consequences. Without innovations, consumers' need for affordable food without compromises in quality, and which continues to retain their trust, cannot be served in the long run (FRITZ AND SCHIEFER 2008).

2.3 Trade Relationships in the SC

In this subchapter the general characteristics of business relationships by reviewing general relationship management literature will be identified.

2.3.1 Definitions and objectives

The aspect of actors' relationships in the supply chains will be analysed more closely after the previous subchapter elucidated the foundations of supply chains, supply chain management. Thus, this section focuses on examining the relationships between actors. Furthermore, the characteristics and problems of actors will be identified.

A business relationship can be defined as an economical exchange of property rights (i.e. transaction) that contains elements of the dyadic and business environments (CLARO *ET AL.* 2003).

„Organizations are continually faced with the challenge of managing the 'people' part of the equation. [...] A number of supply chain initiatives fail however due to poor communication of expectations and resulting behaviors that occur. [...], the management of interpersonal relationships between the different people in the organizations is often the most difficult part." (HANDFIELD AND NICHOLS 1999)

The management of the actors' relations thus forms the central challenge in supply chains. Business relationships are of crucial importance to successful SCM and smoother business cycles in the sown goods business where prices cannot be considered as an effective competitive advantage because all the key players know the general price level. According to LAMBERT ET AL. (1998) business relationships can be understood as gradually developing processes. Moreover, many of the other SCM processes also express relationship characteristics and thus emphasise the importance of them.

The term business relation is a diversely defined theoretical construct (PLINKE 1997) that can be described as mutual; the behaviour between two companies that is dominated by economic goals and each other's needs (DILLER AND KUSTERER 1988). Further emphasis is placed on this explicitly interactive interpretation, when business relations are described as „a consequence of market transactions between a supplier and a demander, those are not coincidental "(PLINKE 1997). PLINKE grants "between the transactions special meaning to the internal connection, those due to attractiveness or obligation for planned, constantly bilateral exchange change leads" (PLINKE 1997).

Various aspects of business relationships are presented below along with their connections to SCM.

2.3.2 Levels of Supply Chain Relationships (SCR)

When discussing relations in supply chains the term 'supply chain collaboration' is often used. This is however problematic since collaboration is a word that has a positive charge, and far from all relations are positive, see for example adversarial, arms-length relation etc.

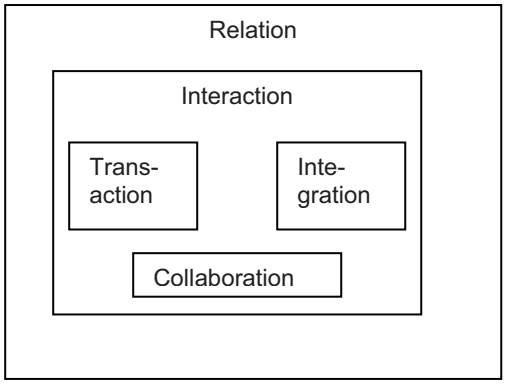
In this thesis, the words *relation* or *relationship* are used in the wider sense, to indicate any link between two companies, regardless if the link is active or not, and regardless if the interaction is adversary or amiable. Relationships are hence something that always exists.

Later the terms "*business relationship"*, "*supply chain relationship"* and "*trade relationship"* are used interchangeably in this thesis.

The term *interaction* is used when the relation is mutual and the companies have some kind of contact. Interaction is hence used to describe the content of the relation. *Collaboration* is here merely one of the levels of interaction.

The degree of interaction between two actors can be described as a continuum, ranging from a single, non-repeated transaction to a full merger into one organisation. Within this scale three different main *levels* of interaction are identified, namely transaction, collaboration, and integration. These three terms put in relation to each other and Figure 2-7 illustrates these.

Figure 2-7: Level of interaction



Source: Own elaboration based on the terminology

Transaction

Transaction is commonly known as the exchange or transfer of goods, services, or funds. A transactional relation implies discrete exchanges of values, where a major issue is price (ACHROL 1991). A transaction defined as single product transactions with limited information sharing was the dominant relation form during the 70's and 80's. These trade exchanges involved tough price negotiations where the supplier relation was adversary and the goal was to increase the individual actor's profit. Examples of terminology describing these relationship types are adversarial arm's-length and non-adversarial arm's-length (COX 2001a) or single and repeated transactions (WEBSTER 1992). These types of relations are characterised by distrust and competition (SKOTT-LARSEN 1999). At the end of the 80's and during the 90's a change took place. Some of the previous competitive relations were replaced or supplemented by strategic partnership characterised by a high degree of information exchange (SKOTT-LARSEN 1999).

Collaboration

To collaborate is generally defined as working jointly or cooperating with someone who one is not immediately connected to. Cooperating in its turn means to act or work together with others for mutual benefit. Examples of types of collaborative relations are adversarial collaborative or non-adversarial collaborative (COX 2001A), partnership (WEBSTER 1992, MENTZER ET AL. 2000), and supplier-producer collaboration (CRAVENS ET AL. 1996).

Integration

Integration is usually defined as the incorporation of two units into one unit. Integration in this thesis is defined as the integration of one or many business processes between two actors.

Ownership could be an enabler for an integrative relation, but is not a requirement. The reasons for this distinction between interaction and ownership are that joint ownership of a process does not necessarily imply an effective cooperation. Examples of integrating relations are vertical integration (WEBSTER 1992), acquisitions (ELLRAM 1991), joint venture (ELLRAM 1991), and complete ownership or mergers (MACBETH AND FERGUSON 1994).

The creation of strong relationships requires the interaction of channel members involving not only communication between sales and purchasing but integrated interaction at multiple levels of the organisations (GADDE AND HAKANSSON 2001, CHRISTOPHER 1998). The broad interface allows rich communication and strong cooperation.

Relationships, interaction and cooperation between organisations are inevitable (FORD ET AL. 2003, STERN ET AL. 1989). It is often assumed that organisations cooperate because they have to, not because they want to.

KOCK (1991) argues that the main reason for organisations to establish, maintain and develop relationships with other organisations is to make the most efficient use of their resources.

Moreover, powerful organisations can force weaker ones to interact because they depend on resources controlled by others (HULTMAN 1993).

Direction of relations

The relations in a supply chain are considered to range either vertically or horizontally. The **vertical** relation is a set of inter-organisational relations between actors in different tiers. The complete vertical chain links the initial supplier all the way to the end-customer. Vertical integration is when an actor increases its ownership to include other actors in different tiers. Vertical integration is usually focused either upstream towards the initial supplier or downstream towards the end-customer (CHRISTOPHER 2005).

The **horizontal** relation is composed of relations within the same tier. Since the companies within the same tier play the same role in a supply chain, the relations are between actual or potential competitors (CRAVENS ET AL. 1996). The incentives for horizontal relations are many. It could be the prospect of together being able to act as one towards a dominant supplier or customer. Together they could develop a particular technology (HINTERHUBER AND LEVIN 1994). Another reason could be the ability to accept overwhelming orders by splitting the workload.

Cooperations between the agri-food enterprises

The necessity for co-operation arises particularly from the dismantling of political borders and as a result of the globalisation of markets. Ever more agri-food enterprises aim at a presence on international markets. To achieve this goal they very often need additional resources as well as additional know-how, so that they can accordingly satisfy the customer's requests under changed market conditions (KUHN AND HELLINGRATH 2002).

A co-operation is present if several enterprises commit themselves voluntarily contractually, in order to coordinate individual or several operational functions noticeably better. The cooperation does not impede their legal and economic independence outside of the boundaries of the cooperation (KUHN 1977).

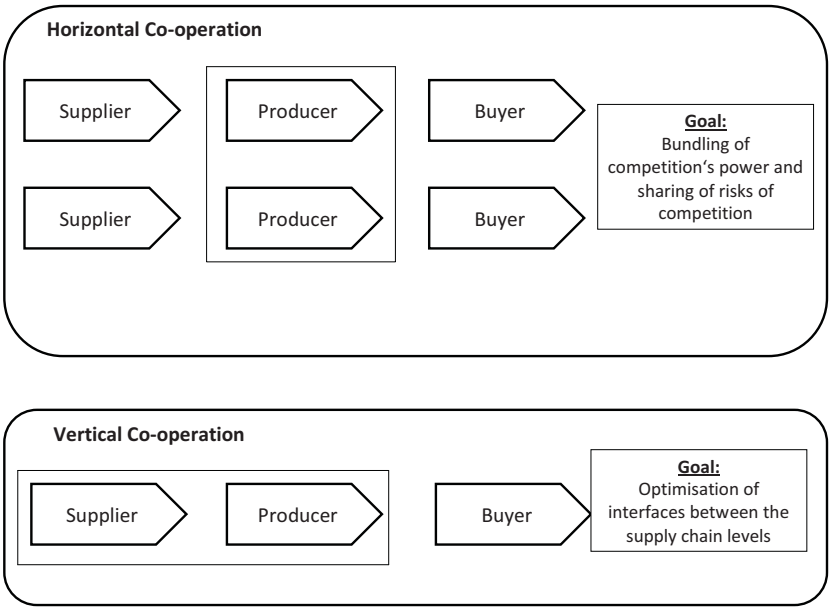
In the agri-food sector two cooperative forms are usual. One differentiates here between horizontal and vertical relations.

Horizontal co-operation mean co-operation between enterprises in the same or similar field of activity, which act on the same creation of value stage. Potentially these are competitors but choose to cooperate with one another so as to achive a higher net yield in their industry.

A **vertical** co-operation is formed through connections of enterprises on different sequential production and/or commercial stages of the same added value chain (MEFFERT ET AL. 2008). The Figure 2-8 represents the different creation of value constellations through co-operation.

The vertical co-operation is the most common form of co-operation in the agri-food sector. On the one hand, one can explain the need for such co-operation by the scarceness of resources. A large number of processors want to secure the purchase of raw materials within a similar time period. On the other hand, in times of food scandals and intensive trade, consumers prefer to consume products whose origins they can trace.

Figure 2-8: Direction of co-operation



Source: Hungenberg 2006

2.3.3 Governance structures

In order to regard the business relation from an economic view, the Transaction Cost Theory (TCT) will be introduced.

Transaction cost economics (TCE) pertains to the co-existence of different forms of organisations and mechanisms for co-ordinating economic transactions: firms, markets, and hybrid forms of governance of exchange relations. The seminal work of COASE (1937) identified this limitation of the neoclassical paradigm. WILLIAMSON (1985, 1991) has since developed Coase's original insights to draw together the core concepts of "transaction cost" in TCE.

The TCT is closely related to the Coase theorem that proposes "that if private parties can bargain without costs over the allocation of resources, they can solve the problem of externalities on their own" (MANKIW 2001).

The analytical focus of the transaction cost theory is placed on transactions. Transaction means the exchanges of goods, services or rights between at least two parties. The following actions frequently cause transaction costs: procurement of information (about potential business partners, prices, etc.), getting in touch with the transaction partner, negotiations and elaboration of contracts, transportation of the goods, control (of quality, quantity, prices, date etc) and adaptation of changes in the agreements (changes of prices, dates, qualities, quantities, etc.)

The transaction cost theory is based on the following two assumptions (SCHRAMM 2005):

- **Bounded rationality**: people don't act in a totally rational way because their understanding and the information of which they dispose are limited;
- **Opportunism**: the economic partners act according to their own interests and try to maximize their benefits. They even use strategic disclosure of information, first mover advantages at contract renewal or calculated misleading to achieve more benefits.

These assumptions generally aren't questioned in literature about New Institutional Economics, although they can be interpreted in a very broad way.

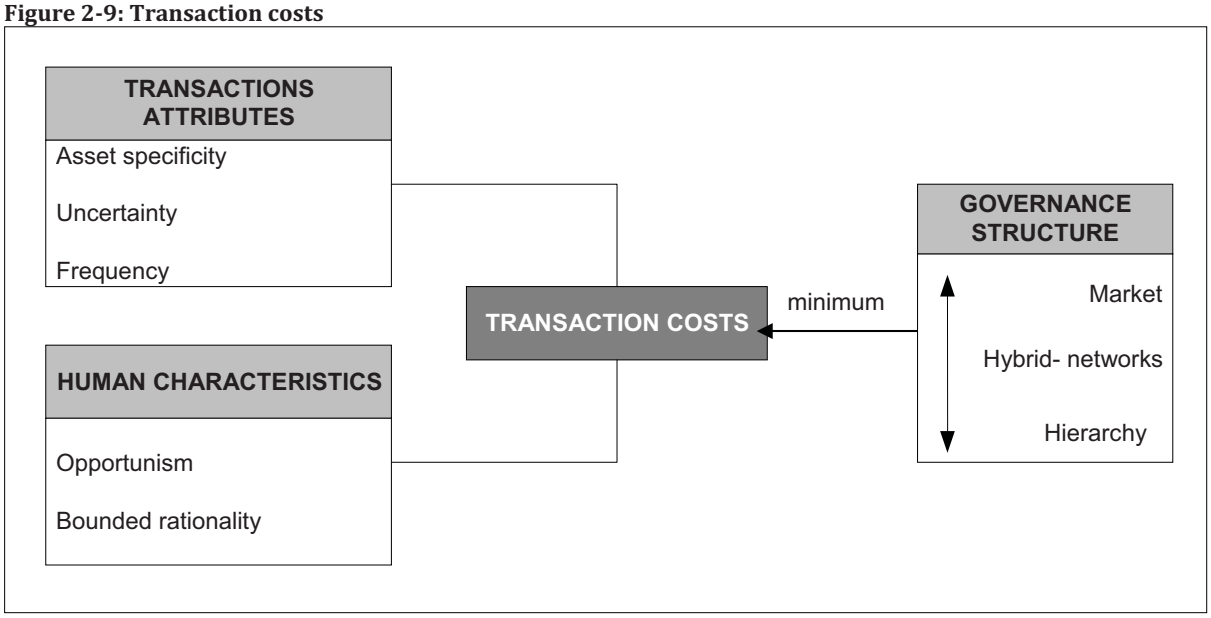
"Transaction cost economies tries to explain the type of organization which will be chosen for transactions" (HENDRIKSE 2003). The interested parties sometimes fail to solve an externality problem because the transaction costs are higher than the costs caused by the externality. To make efficient transactions it is necessary that the parties choose the organisational structure that produces the smallest sum of production and transaction costs.

The following factors highly influence transaction costs (HENDRIKSE 2003):

- **Frequency**: Production as well as transaction costs decrease with an increasing number of identical transactions. Effects of economies of scale or economies of synergies can occur;
- **Asset specificity**: describes the specific investment necessary to carry out a certain transaction;
- **Uncertainty**: is determined by unpredictable environmental influences and possible opportunistic behaviour of the other party. It provides many possibilities for ex-post negotiations.

Depending on the importance of the cost factors, different organisational structures are the most efficient ones. The following Figure 2-9 illustrates the relation between transaction attributes, human characteristis and the governance structure.

Figure 2-9: Transaction costs



Source: Williamson 1985

Transactions with a low level of asset specificity are most efficiently carried out by market exchange. For transactions that require a high level of asset specificity hierarchy the organisational form causes the least costs. When the level of asset specificity is at an intermediate level, a hybrid governance structure is chosen. Examples of hierarchical governance structures are stock exchange listed companies, partnerships, labor-managed firms or cooperatives. Examples of hybrid governance structures are franchises or joint ventures.
A vertical integration offers the advantages of a certain safeguard against bad behaviour.
"*Vertical integration is a way to solve certain problems in situations with a high level of asset specificity, but it also introduces a number of internal organizational problems, which do not outweigh the benefits of vertical integration when there is a lot of uncertainty*" (HENDRIKSE 2003).
To find the optimal organisational structure, frequency and uncertainty have to be taken into consideration as well as asset specificity.

International Transactions

Coordination of transactions across national boundaries involves the same concerns and trade-offs as transactions within a single country, but a number of features of international transactions serve to make those tradeoffs more acute (MASTEN 2000). On the one hand, geographical distances, language and cultural differences tend to raise monitoring costs. On the other hand, greater uncertainty on emerging organic markets, with different national or even different organic rules within the same nation controlled by different private organic farm organisations, could all tend to increase hazards in market transactions across national borders.

2.3.4 Contractual Relationships

WILLIAMSON (1985) expects an efficient alignment of the governance mode and the characteristics of the transactions to exist. In the above context, it is imperative to understand both the contracting process and governance.

Contracts are an important area of study in disciplines other than supply chain management such as in law and economics, and there are several useful definitions.

"An important rationale for a contract that is not typically modeled is that it makes the terms of a relationship explicit." (TSAY ET AL. 1998)

In supply chain management, contracts have special parameters that focus especially on funds, material, and information (that coordinate the supply chain), while disregarding clauses that are important in other areas.

CHOPRA AND MEINDL (2001) give a good definition of contracts for SCM: *"A contract specifies the parameters within which a buyer places orders and a supplier (seller) fulfills them. A contract may contain specifications regarding quantity, price, time, and quality"* (CHOPRA AND MEINDL 2001).

The contracts can facilitate long-term partnerships by delineating mutual concessions that favor the determination of business relationship, as well as the specifying penalties for non-cooperative behaviour. The lenght of the time horizon may encourage parties to engage in activities that are unfavorable in the short term (TSAY et al. 1998). For better understanding of the contract's policy a comparison is done in the next subchapter.

2.3.4.1 Short-term versus Long-term contracts

In the following section, the differences of short-term and long-term contracts are described, where a business-to-business exchange (also called spot market) is regarded as the extreme form of a short-term contract. Long-term contracts have a number of advantages over short-term contracts and vice versa. The Table 2-3 lists the advantages of the appropriate contracts.

Table 2-3: Advantages of long-term and short-term contracts

Advantages of long-term contracts	Advantages of short-term contracts
potential for higher quality	reduction of cycle times (yet often at the expense of higher costs)
reduce cost uncertainties	short-term contracts may be advantageous due to the speculative advantage of leaving sellers at nearly any time as well as the flexibility to switch to other sellers
lower variable production and transactions costs	near-zero fixed investments
provides incentives for suppliers to lower prices so as to secure sales	if e-procurement solutions are used, a number of potential suppliers can be reached and better contract prices can be negotiated
possible improvements in delivery lead time performance	most often access to a broader competitive market
high probability of order fulfillment in the face of demand volatility	allows fine tuning of demand and supply
low costs due to low probability of low quality and off-spec products, more stable contract production through advanced planning, lower cost staffing, and maintenance and other production decisions	provide lower costs (e.g. through reductions in labor costs in the purchasing process)
facilitates easier and more frequent communication and information exchange	short-term procurement is possible (actually, the lead time may essentially be negotiable
more effective monitoring of production processes	

Source: Weissman 1991, Cohen and Agrawal 1999, Peleg et al. 2002, Kleindorfer and Wu 2002

Yet there are also disadvantages of long-term contracts compared to short-term contracts, such as establishing a long-term relationship with suppliers requiring a fixed investment for the effort and cost of selecting the optimal supplier (COHEN AND AGRAWAL 1999). Some advantages of short-term contracts, which are described in the Table 2-3 above, can obviously be regarded as disadvantages of long-term contracts depending on the business environment.

While there is a subtle difference between a short-term contract and procurement on a spot market, a short-term contract with a very short duration can approximate a spot market (AKELLA ET AL. 2002). Spot markets, which are technology solutions that facilitate corporate buying, using the Internet, have additional benefits (KLEINDORFER AND WU 2002). Yet there are also disadvantages of spot markets (KLEINDORFER AND WU 2002, SEIFERT ET AL. 2003):

- higher unit costs than (long-term) contracts (often due to higher production costs, which stem from short-term capacity planning);
- possibly poorer matching product specifications and delivery features;
- possibly high costs due to high ”last minute” production costs;
- companies using spot markets may exhibit substantial price uncertainties (partly due to the added procurement flexibility).

2.3.4.2 Quality signs of agri-food products

The quality can be examined and fixed as one of the contract’s clauses (TSAY ET AL. 1998). For the most part agri-food markets are valid, legally justified trade regulations, which contain clear assessments of quality both for producer of the agri-food production and for consumers. These are fixed either in regulations, either due to the country’s law or European Union regulations and are valid for the entire European Union. Concerning these regulations the food products are arranged according to grades, which depend on specific quality criteria. On the basis of the differentiation of the grade patterns (standardization), fixed in the national or international trade regulations, the goods offered must be divided into the appropriate grades (STRECKER ET AL. 1996).

The adjusting legislation and the standards, which are valid to consider, increase through arising food scandals and requirements for food safety. In order to implement continuous quality and food safety for the consumers, the producers apply increasingly different techniques.

The agri-food enterprises currently have to deal with a multitude of legislative as well as market-related requirements on quality (POIGNÉE 2008).

The standardization and the classification gain ever more significance with the marketing of fresh food products. The fixed grades make it possible to correctly evaluate the products, since many of these goods exhibit large quality differences due to their biological character. Thus the appropriate quality and price stages are easy to define. And finally a higher transparency of the market for all market players is thereby created, which leads to the rationalization of the flow of goods (STRECKER ET AL. 1996).

The trade relations of the countries enable more intensive achievements and delivery entwinements between final product manufacturers and their suppliers, duty paid world-wide

facilitates the penetration of internationally valid standards and classifications in the agri-food industry.
Table 2-4 (for more detailed information see Annex 1) provides an overview of quality signs in European food chains, third party auditing, or guarantees, using the example of Germany.

The quality signs are a result of quality controls and can therefore minimize qualitative procurement risks (POIGNÉE 2003). A functioning quality assurance allows the requirements of the consumers at product quality and food safety consideration to be met.

Table 2-4: Extract of quality signs in European food chains, using the example of GERMANY (see Annex 1 for more details)

Chain level	Beef	Pork	Poultry	Grain	Fruits	Vegetables
Farmer - Ind	Q+S; ISO 9000	Q+S; ISO 9000	Q+S; ISO 9000	GlobalGAP; Q+S, Basis quality / Management; ISO 9000; GMP 06	QS; GlobalGAP; ISO 9000	QS; GlobalGAP; ISO 9000
Ind - Retail	QS; IFS:; BRC: ISO 9000; ISO 22000; HACCP	QS; IFS:; BRC: ISO 9000; ISO 22000; HACCP	QS; IFS:; BRC: ISO 9000; ISO 22000; HACCP	GlobalGAP; QS; ISO 9000; ISO 22000; GMP 02:	QS; IFS:; BRC: ISO 9000; ISO 22000; HACCP	QS; IFS:; BRC: ISO 9000; ISO 22000; HACCP
Ind - Retail	ELOT 1416; AGRO 3-1 & 3-2 & 3-3 & 3-4; QS; ISO 9000; ISO 22000; HACCP	ELOT 1416; AGRO 3-1 & 3-2 & 3-3 & 3-4; QS; ISO 9000; ISO 22000; HACCP	ELOT 1416; AGRO 3-1 & 3-2 & 3-3 & 3-4; QS; ISO 9000; ISO 22000; HACCP	ELOT 1416; AGRO 3-1 & 3-2 & 3-3 & 3-4; QS; ISO 9000; ISO 22000; HACCP	ELOT 1416; AGRO 3-1 & 3-2 & 3-3 & 3-4; QS; ISO 9000; ISO 22000; HACCP	ELOT 1416; AGRO 3-1 & 3-2 & 3-3 & 3-4; QS; ISO 9000; ISO 22000; HACCP

Source: Krieger and Schiefer 2007; Hofstede et al. 2007

2.3.5 Factors affecting SCR

There are several factors affecting the relationship in the supply chain. In some cases, two factors are correlating to each other, for example, a low level of trust might demand a highly specified contract. In this section, some of the factors commonly known to affect the supply chain relations are presented (see Table 2-5).

Table 2-5: Factors affecting the trade relations

Factor	Definitions	References (sorted by year)
Trust	The ability and willingness to rely on the salesperson's integrity and behaviour so that the long-term expectations of the buyer will be met.	Anderson and Weitz 1989; Crosby et al. 1990; Moorman et al. 1992; Morgan and Hunt 1994; Kumar 1996; Donney and Cannon 1997; Leuthesser 1997; Dorsch et al. 1998; Smith 1998; Corbertt et al. 1999; Buttle 1996; Hewett et al. 2002; Walter et al. 2002; Sahay 2003; Ivens 2004; Fritz 2006, 2007; Firtz et al. 2007; Fritz and Fischer 2008; Reynolds et al. 2009.
Commitment	The parties' firm and consistent motivation to maintain a certain relationship that is valued by them.	Dwyer et al. 1987; Weiss and Anderson 1992; Moorman et al. 1992; Morgan and Hunt 1994; Gundlach et al. 1995; Hewett et al. 2002; Fullerton 2003.

Table 2-6: Factors affecting the trade relations (Continuation)

Factor	Definitions	References (sorted by year)
Satisfaction	The assurance, perceived by the buyer, regarding the salesperson's future performance, given that past performance has been consistently satisfactory.	Crosby et al. 1990; Naudé and Buttle 1996; Parsons 2002.
Communi-cation	The ability to use unique combinations of code, content, and communication rules to communicate effectively.	Williams and Spiro 1985; Reynolds et al. 2009.
Frequency of interaction	Frequency refers to how often a transaction occurs.	Ellram 1991; Parkhe 1993; Dekker 2004; Meer-Kooistra and Vosselman, 2000.
Time frame	The time frame is the period of time when the relation should exist. This factor is traditionally viewed as an important differentiator since a long-term relation by definition is constituted of a high level of interaction.	Corbett et al. 1999.
Power	When designing a supply chain and cooperating with other companies, one has to consider the other actor's size, impact, and status. If the other actor is larger in size, has greater impact, and higher status, it will have more power in that relation. With greater power comes the ability to force a weaker actor to make decisions that are merely favorable for the powerful actor.	Butaney and Lawrence 1988; Cox 2001a; b; Watson 2001; Cox et al. 2004.
Mutual goals	The degree to which parties share goals that can only be achieved through joint action and the maintenance of the relationship.	Weitz and Jap 1995; Wilson 1995; McQuiston 2001.
Customer orientation	The degree to which salespeople adopt behaviours aiming at increasing the customer's long term satisfaction.	Saxe and Weitz 1982; Kelley 1992; Dorsch et al. 1998.

Source: Own elaboration

From the depiction of the different factors, which may have an influence on the business relations, and the main objective of this thesis, it can be established that trust is a key factor in the interaction. Thereupon, this thesis will focus on trust more specifically in Chapter 3.

2.4 E-commerce-enabled SCM

The previous subsections have discussed the theories and literature starting from a general level and focusing on issues related to SC and SCM. This section will review the literature on e-commerce and its role in SCM.

2.4.1 ICT and e-business background

The disparate factors of the supply chain (such as planning, purchasing, manufacturing, warehouse management, and logistics) have resulted in a formidable challenge because many activities were adopted and introduced ad-hoc in a company.

The separate factors of the supply chain grew and evolved over the years. These factors have to be linked together to ensure optimization of resources and costs. As a result, software vendors have come up with solutions to provide this synergy, synchronization, and optimization of the supply chain.

Further coordination and integration of the factors of a supply chain has become possible with the advent of the Internet. Several researchers have made predictions on how the Internet will impact the supply chain. The Internet provides the basic engine to initiate, propagate, support e-commerce, and synchronize the entire supply chain. Some of the activities that are possible via the Internet are (CHRISTOPHER 1998, HAGEL AND SINGER 1999, JOHNSON 2000, TYNDALL ET AL. 1998):

- Product and marketing information, catalogues, and pricing data;
- Customer communication, order management, acknowledgement, and service;
- Supplier communication, data interchange, and purchase orders;
- Financial transactions between the firm and its suppliers and customers;
- Electronic delivery of products and services;
- Rebuilding the supply chain.

However, the Internet is only a tool to better synchronize and facilitate supply chain management and cannot replace it - the outcome will be lower costs, higher speed, and increased customer satisfaction (ANDERSON AND LEE 2000).

The review of extant literature shows plenty of papers dealing with information technology (IT) in SCM (GUNASEKARAN AND NGAI 2003, HAUSEN 2005, FRITZ AND HAUSEN 2008). Common terms for business models using IT are e-business and e-commerce – the former relating commonly to web-based sales, and the latter to a more integrated use of IT; however, e-business refers to the use of Internet (CROSS 2000, CHOPRA AND MEINDL 2001, LEE AND WHANG 2001A, JOHNSON AND WHANG 2002, CAGLIANO ET AL. 2003). In the recent literature, for example, SIMCHI-LEVI ET AL. (2003), DAWSON (2002), CHOPRA AND MEINDL (2001) and LEVARY (2000) provide discussions on the role of new IT for SCM. According to SIMCHI-LEVI ET AL. (2003) objectives of IT in SCM are:

- Providing information availability and visibility;
- Enabling single point of contact of data;
- Allowing decisions based on total supply chain information;
- Enabling collaboration with supply chain partners.

By bringing together large numbers of buyers and suppliers and automating transactions, Internet-enabled markets expand the choices available to buyers, give suppliers access to new customers and reduce transaction costs for all participants (KAPLAN AND SAWHNEY 2000).

An explicit overview of the benefits of IT and IT tools will be provided in subchapter 2.3.2. Hence an introduction to e-Business and its performance in a B2B environment will be presented.

JOHNSON AND WHANG (2002) define e-business as "the marriage between the Internet and supply chain integration …" and divide various forms of e-business into the three categories: e-commerce, e-procurement, and e-collaboration (JOHNSON AND WHANG 2002). ***E-commerce*** allows several networked supply chain partners to identify and respond quickly to changing customer demand captured over the Internet. ***E-procurement*** enables companies to use the Internet in the procurement process of direct and indirect materials and to handle value-added services like transportation, warehousing, customs clearing, payment, quality validation, and documentation. ***E-collaboration*** alleviates the coordination of various decisions and activities beyond transactions among supply chain partners over the Internet (JOHNSON AND WHANG 2002).

E-commerce and their opportunities are described in more detail afterwards.

Electronic commerce (WIRTZ 2001, MERZ 2002, MEIER AND STORMER 2005) is the use of electronic computers connected in a network to facilitate commercial transactions between a buyer and a seller. In this environment, specific software and hardware are set up to provide adequate support for a faster pace of transaction flow.

There are two broad categories of e-commerce buyers: consumers and business (WIRTZ 2001, MERZ 2002, MEIER AND STORMER 2005). One simplified definition of Business-to-Business (B2B) and Business-to-Consumer (B2C) can be as follows: B2B covers the flow of products from suppliers to manufacturers to wholesalers to retailers, while B2C covers the flow of products from the retailers to the end consumers.

According to the literature the forms of e-commerce regarding the transaction partners are divided into three groups:

1. Private persons/consumer (Consumer);
2. Enterprise (Business);
3. Public institutions (Administration) (WIRTZ 2001).

These can occur in each case as demanding parties or as suppliers of electronic performance in feature. Therefore altogether nine supplier–buyers constellations can be derived and are represented in a 3x3 matrix (see Figure 2-10).

Figure 2-10: Interaction matrix in e-business

Administration to Consumer (A2C)	Administration to Business (A2B)	Administration to Administration (A2A)
Business to Consumer (B2C)	Business to Business (B2B)	Business to Administration (B2A)
Consumer to Consumer (C2C)	Consumer to Business (C2B)	Consumer to Administration (C2A)

Source: Wirtz 2001

The suppliers provide information about their performance (goods and/or services) within electronic nets, which the receivers may call on when desired. For example B2B can operate

within the range of an Internet-based commercial platform. In B2C e-commerce, enterprises face each other as offerers and consumers as demanding parties during a transaction process (WIRTZ 2001).

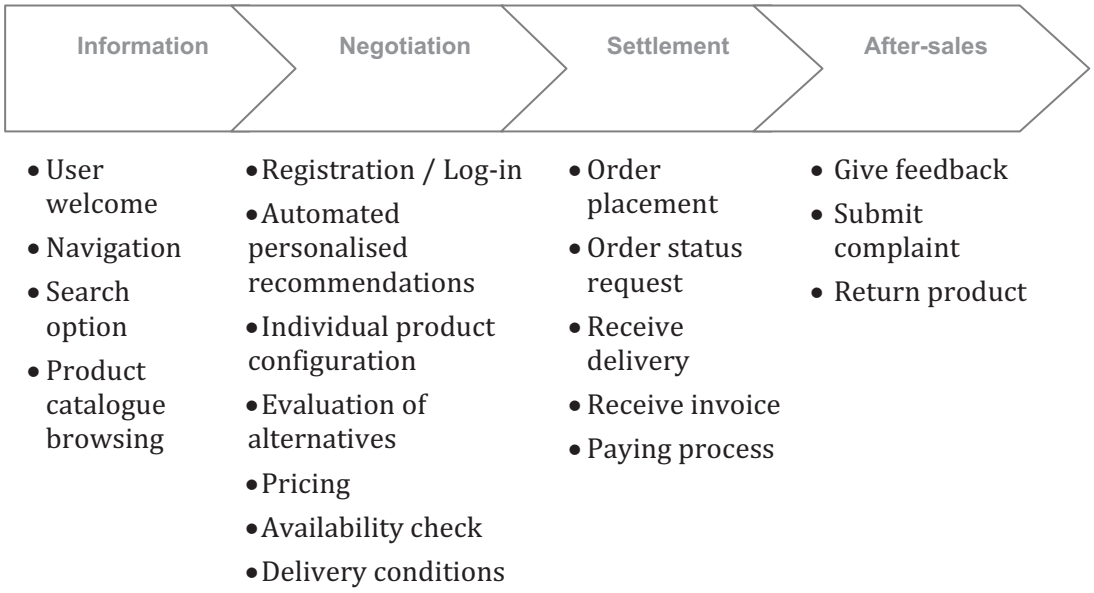
Transaction phases

The individual transaction represents the starting point of the previously mentioned transaction process. A transaction takes place if a property or an achievement will be transferred via a technically separable interface (WILLIAMSON 1981).

In general, every transaction can be subdivided into four transaction phases: 1. information phase, 2. negotiation phase, 3. settlement phase, and 4. after-sales phase. In the B2B e-commerce context, the information phase serves to gather general information about the website's organisation and to retrieve further details about the supplying company. The negotiation phase aims to narrow the focus of interest. The negotiation phase ends with a detailed contract about product specification, delivery terms, and payment conditions. In the settlement phase, the website supports the customer to exchange further documents with the trading partner, to process the order, to initiate the payment, and to track the order status. The after-sales phase aims on facilitating the contact (e.g. questions and feedback) between the trading partners via electronic media (HUNG AND MCQUEEN 2004).

Figure 2-11 shows a detailed overview of the phase-related activities.

Figure 2-11: Transaction phases



Source: Hung and McQueen 2004

2.4.2 Business-to-Business (B2B) e-commerce

E-commerce (in the form of trading through the Internet) is a phenomenon of the Internet. With the help of the Internet, computer, and computer networks, companies in a supply chain can be connected in real time with information and knowledge shared continuously, new products and services can be designed to fit special market segments and new supply chain structures can be

developed to serve customers in a more direct manner (LEE 2002). However, in electronic data interchange (EDI), an application also termed e-commerce is found. So, e-commerce is also a phenomenon of EDI, which is a type of IT. Although there have been several failures in the e-business arena, whether it is B2B or B2C e-commerce, there is no doubt that the Internet has changed the way that business is done in several ways.

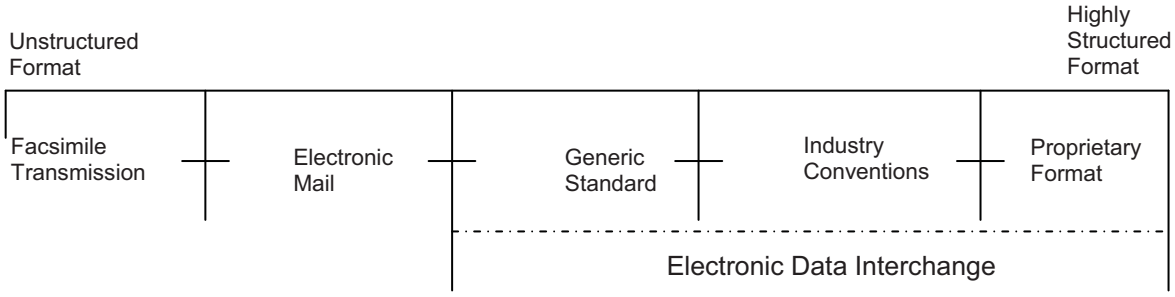
E-commerce is not just a single technology but a combination of technologies, applications, processes, business strategies and practices necessary to do business electronically. Applications of e-commerce, which involve the automation of commercial transactions using computer and communications technologies, began in the early 1970's with innovations such as the electronic transfer of funds. The introduction of EDI expanded the scope of e-commerce from the financial institutions to manufacturers, retailers and others in the service sector. EDI is important component of B2B e-commerce.

2.4.2.1 Electronic data interchange (EDI)

EDI has been primarily used in the subcontracting area and has been proven most effective in supporting operational-level applications, mainly due to its limited technical capabilities and the existence of multiple technical standards (LI AND WILLIAMS 2000). In order to support more complex and strategically more important applications and processes, some organisations have maintained dedicated data links between their computer systems, using various interfaces and communication protocols capable of handling more sophisticated forms of information exchange (BORMAN AND WILLIAMS 1996).

EDI can be defined as the movement of business documents electronically between or within firms (including their agents or intermediaries) in a structured, machine-retrievable data format that permits data to be transferred, without re-typing, from a business application in one location to a business application in another. There are a number of ways to transmit data electronically. In general, moving electronic data between two points is called electronic messaging. The various forms of electronic messaging may be arrayed along a continuum (see Figure 2-12) from unstructured to highly structured. As the figure shows, EDI allows the use of generic formats intended for use by any of the trading partners, industry-specific formats designed to suit the needs of a particular type of business, as well as proprietary formats that may be limited to particular firms and their trading partners (HANSEN AND HILL 1989).

Figure 2-12: Electronic Data Interchange (EDI)



Source: Hansen and Hill 1989

In the former case there is one agreement to exchange EDI messages between "n" trading partners, in the latter there are "n" agreements to use a specific message standard between "n" trading partners. With growing numbers of trading partners, "n", the latter is not a feasible solution.

The use of electronic documents has some advantages to paper documents besides reducing the paperwork. Because no data is re-typed from document into a computer system no errors can occur in the data passed between business partners. The inaccuracies in messages passed between humans cause delays and incur additional costs if orders or requests are executed wrongly. With electronic documents these ambiguities disappear, leading to more certain supply chains, shorter lead times, lower stocks, all resulting in a better service provided to the customer. EDI systems can always be available irrelevant of office hours with human involved systems. EDI is said to make the business processes more streamlined, driving efficiencies across the company's boundaries. CLARKE (1998) defines the following advantages of EDI:

- No re-capturing or re-typing of data: reliable systems, the customer can have peace of mind, fewer errors and handling of exceptions;
- Faster data transfer than with paper document: faster order processing;
- Faster handling of invoices – this improves the company's cash flow;
- Reducing costs: less paper, less postal and administration costs (CLARKE 1998).

EDI becomes increasingly more important and implies far more than only technical communication problems (ZBORNIK 1996)

2.4.2.2 E-marketplaces

E-marketplaces (EM) (also known as net marketplaces, trading hubs or exchanges) are just one of many new business phenomena that are changing the way companies do business worldwide, especially with regard to buyer-supplier relationships.

Different authors have tried to map the landscape and development of electronic marketplaces. One of the first authors to describe the principle of an electronic marketplace did so already in 1988. In the late nineties and early years of this decade, there have been lots of publications on electronic marketplaces.

Electronic marketplaces are an important element in the landscape of e-commerce between companies. They gained relevance because they could be considered one of the goals of an ongoing process which tried to improve the functionality of electronic means, in order to create efficient value-added e-Web and value-driven business models (SKJOTT-LARSEN ET AL. 2003).

In the area of SCM, much attention has been focused on e-marketplaces and their potential benefit to an organisation's supply chain capabilites.

In an e-marketplace, buyers and sellers are brought together for the purposes of information exchange, the buying and selling of products and services, and the financial transactions. All of these exchanges take place through a website instead of a physical space. These e-marketplaces result in benefits for both buyers and sellers.

As e-shops usually represent the business model which enables transactions between business and consumer (B2C), e-marketplaces are Internet platforms which support electronic transactions between a considerable number of buyers and sellers (KOURGIANTAKIS AND PETRAKIS

2007). A more precise definition of e-marketplaces, agreed upon by the literature, is the one from HOLZMULLER AND SCHLUCHTER (2002) who specify that Internet-based business-to-business electronic marketplaces are "*open electronic platforms facilitating activities related to transactions and interactions between multiple companies*" (HOLZMULLER AND SCHLUCHTER 2002, WANG AND ARCHER 2007).

In this consideration, e-marketplaces have been analysed, and studied in their evolution, from supports for the aggregation of business operators, to supports for transactions, evolving at last into supports for the collaboration among firms (WANG AND ARCHER 2007).

GRIEGER analysed this question with different literature sources (GRIEGER 2003). He limits the electronic market to the fact that an exchange in an electronic marketplace "*involves multiple buyers and sellers and it centralizes and matches buy and sell orders and provides post-trade information*." By using this definition he excludes portals and excludes initiatives of companies that create an online marketing channel.

In the analysis of e-marketplaces, many authors focused their attention to the link between organisational issues, Supply Chain Management and the development of Internet-based Information and Communication technology. The adoption of IT and web-based applications raised a big challenge in organisations, because in spite of the potentials offered for the efficient management of supply chains and for the efficient organisation of procurement and supplier relationship management (FRITZ 2007B), it asked for effective supply chain organisations and for strategic decisions to structure their B2B relationships well (KATHAWALA ET AL. 2002). Thus it is possible to observe that especially big enterprises and companies, with well-established organisational processes and supply chain management, successfully accessed E-Commerce and ICT solutions, being able to create interconnected networks and to gain internal efficiency and external integration with other companies (EUROPEAN COMMISSION 2005).

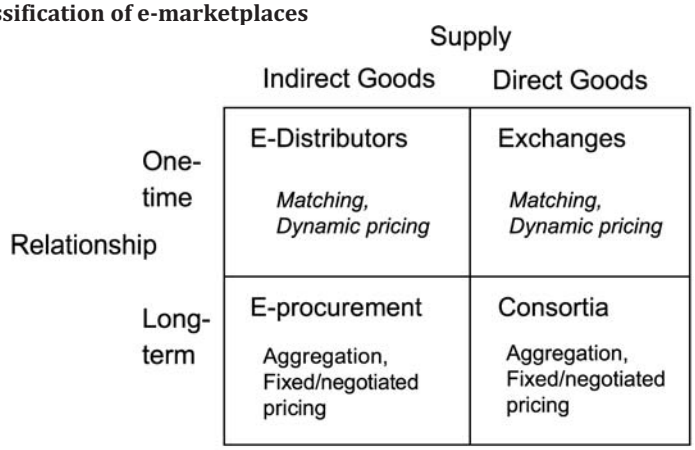
From the perspective of sellers, an e-marketplace opens up their services and products to a large number of customers as compared to traditional business. Furthermore, through better communication with potential buyers, which maximizes input in design decisions, a seller can supply a better product and can reduce inventory levels across the entire supply chain. As far as the buyer is concerned, a much greater choice of products is available than before, and it is easier to find the best value at the lowest price. An e-marketplace can cover a portion of traditional procurement process from need identification and supplier selection through to final transaction.

In an e-marketplace, a partner can participate in any stage of the supply chain, and is able to remove some of the inefficiency traditionally associated with the supply chain. This allows partners to streamline their supply chains and supplier relationships, and improve coordination with suppliers, and allows users to share information instantaneously. However, the ultimate goal, and the main driver for e-marketplace integration, is to reduce supply chain management costs.

There are several criteria for classifying e-marketplaces. LAUDON AND TRAVER (2002), for example, offered a classification based on business functionality. An e-marketplace can either provide indirect goods that support the production process or the direct goods used in production. The way the buying process can also fall into two categories: long-term contractual

buying between two entities, or a one-time (spot) purchase with no long-term relationship between the two parties. Based on these two criteria, LAUDON AND TRAVER (2002) classified e-marketplaces into four categories, as shown in Figure 2-13.

Figure 2-13: Classification of e-marketplaces

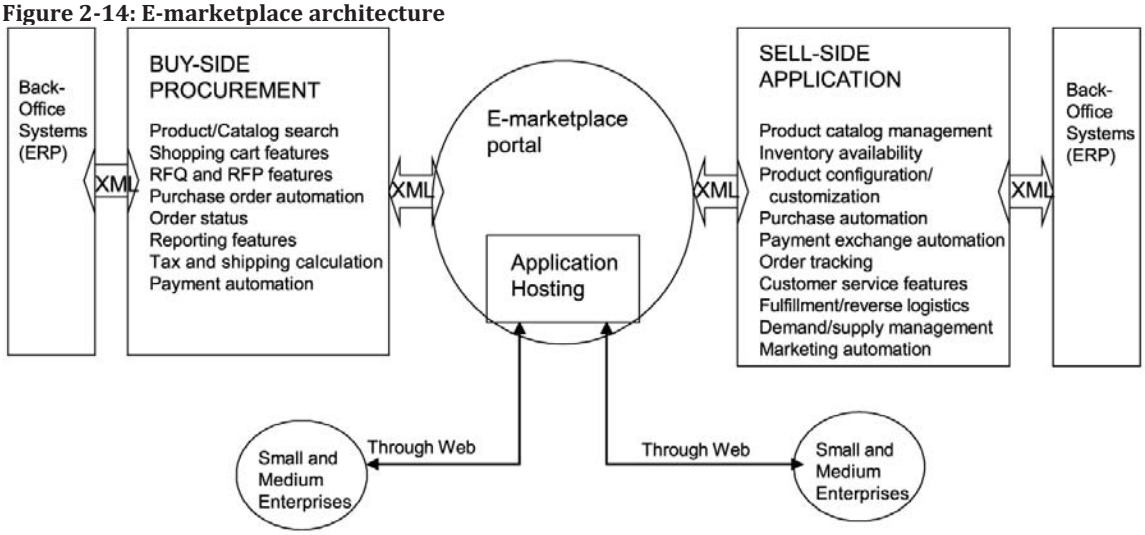


Source: Laudon and Traver 2002

These categories are not mutually exclusive, and e-marketplaces may fall into more than one class. The setting up of an e-marketplace requires buy-side procurement capabilities, sell-side e-commerce and order management capabilities, and a centralised portal or network. Most e-marketplaces were driven first by the implementation of a buy-side e-procurement solution by buying organisations. So although a buy-side procurement application is essential for an e-marketplace, sell-side e-commerce and order management functionality is equally important. It is important for the buyers who are looking to turn their internal e-procurement implementations into revenue-generating opportunities as well as for suppliers who are looking to connect with the various emerging e-marketplaces.

In addition to buy-side and sell-side e-commerce functionality, another important component of e-marketplaces is a centralised portal. The e-marketplace portal serves as the hub connecting buyers and suppliers, and is used for catalog hosting and management as well as transaction services such as auctions, logistics and payments (WELLER 2000). For small and medium-sized enterprises (SME), software applications and functionality can be hosted on the portal itself (see Figure 2-14).

Figure 2-14: E-marketplace architecture



Source: Weller 2000

2.4.2.3 E-platforms in the agri-food sector

The Food and Beverage (F&B) sector deals with the production of raw materials, the transformation of agricultural products and the production of processed food.

For the agri-food transaction, e-commerce has often been criticized because physical product inspection and direct contact between transaction partners is not possible and denoted as too anonymous (FRITZ ET AL. 2007).

According to "The European E-Business Report" of the European Commission the Food and Beverages sector is one of the major pillars of the European economy. The European statistics show that in 2004, the EU-25 food and beverages industries as a whole turned over 815 billion euros, transformed over 70% of the EU-S agricultural raw materials and employed 3.9 million people, of whom the majority work in SMEs.

Although the Food and Beverage sector has a relevant role in the European economy, the adoption of ICT such as networks, computers, data processing, transmitting equipment and software is at a lower level than in other sectors. The E-Business Scoreboard (EUROPEAN COMMISSION 2007) composed of several ICT indicators shows that in the Food Sector the adoption of different types of e-business has been situated below the average of the ten studied industry sectors (Footwear Industry, Pulp & Paper Industry, ICT Manufacturing Industries, Consumer Electronics, Shipbuilding and Repair, Construction, Tourism, Telecommunications and Hospital Activities) (see Table 2-7).

Table 2-7: The relevance of ICT and the e-business in 10 sectors (2006)

Application	e-Sourcing & procurement	e-Logistics / SCM	e-Design & planning	e-Market. & Sales	ICT use for innovation	Perceived ICT signific.
Food & beverage	**++**	**+++ ***	**++**	**+ ***	**++**	**++**
Footwear	+	+	+	+ *	++	+
Pulp & paper	+++	+++	++	++ *	++	++
ICT	++++	+++	+++	++ *	++++	+++
Cons. Electronics	++++	++ *	+++	++ *	++++	+++
Shipbuilding	++	++	++ *	+	+ *	++
Construction	++	+ *	++ *	+	+ *	+ *
Tourism	++ *	++ *	+ *	+++ *	++	++ *
Telecoms	++++	++	+++	+++ *	++++	++++
Hospital activ.	+++	++	++	+	+++	+++

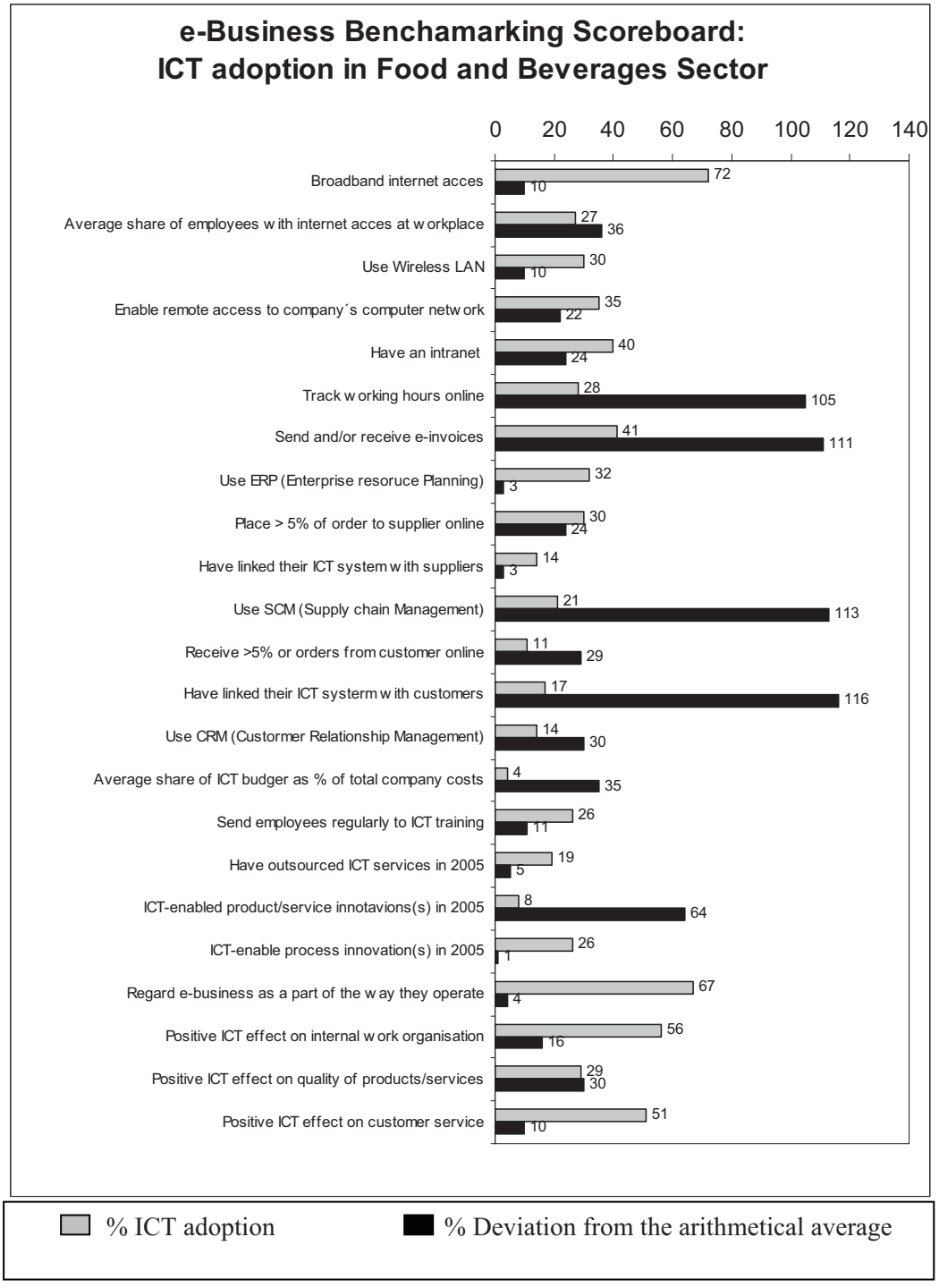
+ = below average relevance; ++ = average relevance; +++ = above average relevance;

++++ = high relevance; * = applies only for some sub-sectors

Source: European Commision 2007

More detailed information about the ICT adoption in the food sector and its deviation from the arithmetical average is presented in the figure below (see Figure 2-15). It is obvious that plenty of individual ICT activities have a very low adoption rate which explains the wider gap in the ICT adoption in the food sector.

Figure 2-15: ICT adoption in Food and Beverage sector



Source: European Commission 2007

As previously mentioned, in the last decade different e-marketplaces have emerged. There are many different types of e-marketplaces present today in the agrifood sector. Next, an overview of the current landscape of e-marketplaces in the agrifood sector is provided.

FRITZ ET AL. (2004) analyse the electronic business landscape, providing tools for the classification of e-marketplaces in the agrifood sector, according to its peculiarities. Through a clustering of the platforms, they identify evolution and strategic development lines in agrifood e-marketplaces.

In the agri-food sector, e-marketplaces are present, but their diffusion together with the adoption of e-business activities is very slow, due to the peculiarities of agrifood products (FRITZ 2007B) and to cultural factors. Traditional purchasing behaviour cannot be fitted neatly into e-marketplaces and the need for personal interaction is still very strong. Moreover, a lack of trust in online transactions and in business partners can be assessed (EUROPEAN COMMISSION 2007).
In the agri-food sector, then, e-marketplaces developed over the last years, but at a closer look most of them are but tools to share information, without doing real e-business.
As said below, few e-marketplaces in the agrifood sector allow online transactions: they are mainly privately owned e-marketplaces, set up in order to inventorise posted offers and requests.
FRITZ ET AL. (2004) identified that the agri-food platform infrastructure in the US and Europe has dramatically changed during the short period between the years 2000 and 2002. Only about 30% (25) of the 85 platforms identified in 2000 remained as trade platforms in 2002. About 45% (38) went out of business altogether, about 25% (19 platforms) changed their focus to activities other than trade platforms or merged with other platforms (3). Furthermore, of the 36 agri-food platforms existing in 2002, about 30% (11) entered the market after the year 2000.
The combination of platform closures on the one hand and new entries on the other might indicate deficiencies in business models of early platform enterprises that new entries might have avoided. However, late entrance was no guarantee for success. Of 18 platforms that entered the market after the year 2000, only 11 remained active whereas the others (almost 40%) discontinued their activity shortly after their market introduction.
A recent research, based on this one by FRITZ ET AL. (2004), and additionally approaching the signs of trust and how these are presented on the e-marketplaces, shows that there has been no significant development in this area (BRIZ ET AL. 2008).
Sixty e-marketplaces are analysed, and the gained insight and trends are presented as follows:

Exchange of information instead of electronic commerce

In the early days of electronic marketplaces, most of them focused on providing an electronic market for buyers and sellers. Based on the analysis of FRITZ ET AL. (2004) and the present text, it is shown that from the companies that existed in the late nineties, a sizeable fraction have ceased to exist or merged with competitors. There is also a third group that can be defined: This group consists of companies that changed their services from providing an electronic marketplace to providing data services (BRIZ ET AL. 2008).

Mergers in large marketplaces

In the decade that electronic marketplaces are in place one can see that different mergers took place in different marketplaces. One big merger is the one between Transora and UCCnet into 1SYNC, and GNX and WWRE into Agentrix that are both specializing in the retail market. Other examples of mergers are emergeInteractive that was purchased by Micro Beef, Agribuys and foodconnexWorldwide fused into Foodlink online. The large number of mergers in the electronic marketplaces might be a result of the immature market in which these companies have grown. This seems to be occurring at a consolidation phase of e-marketplaces (BRIZ ET AL. 2008).

"Communities" of e-marketplaces

In order to satisfy users' needs, e-platforms have to improve their structure and the provided services, in order to be able to properly answer every request. The evidence from this approach showed that one of the main reasons for the failure of some platforms is the inability of e-commerce itself to face users' requests and to satisfy them. Platforms are able to deal with macro-answers, but they often show numerous limitations in their capability to comply with clients/users' requests.

In order to get in touch with a larger number of clients or to provide more detailed services, or even to induce a sort of fidelity bond between platforms and users, the analysis of e-marketplaces highlighted the tendency to create groups of platforms which show similarities in their structure and differ only in the traded products. These "communities" of platforms and of e-marketplaces seem to create further networks into the e-environment (BRIZ ET AL. 2008).

E-Markets that are set up by primary producers

Another development is electronic markets that are set up by groups of primary producers. These associations of producers may have historically grown such as the association behind *Schweinebörse* or fairly new associations like *Decorum*. These initiatives are interesting in the fact that they can alter the way business is organised. In the current agri-food business configuration there is an important role of trade-middlemen. With initiatives that are set up by primary producers this might change (BRIZ ET AL. 2008).

2.4.3 ***Benefits of e-commerce***

E-business is particularly important for supply chain management as a consequence of the increasing need for integrated activities and information flows and to optimize the processes, not only at the individual company level, but also at the level of inter-company processes (STEVENS 1989, DESOUZA ET AL. 2003).

ICT in general and ICT in SCM are viewed to have great opportunities, ranging from direct operational benefits to the creation of strategic advantages. For example MCFARLAN (1984), BENJAMIN ET AL. (1984), and PORTER AND MILLAR (1985) argued already in the 1980s for the strategic possibilities of ICT for business. PORTER AND MILLAR in particular advocate that ICT changes industry structures and rules of competition, creates competitive advantages, and creates new business opportunities. In the logistics/supply chain context, BOWERSOX AND DAUGHERTY (1995) outlined that ICT is key in supporting companies creating strategic advantages by enabling centralized strategic planning with centralized day-to-day operations.

A common view is that ICT has a profound impact on managing supply chains. One group of scholars argues that because of ICT, supply chains become less integrated and more market-oriented (MALONE ET AL. 1987, GOLICIC ET AL. 2002, WILLIAMS ET AL. 2002). For example, WILLIAMS ET AL. (2002) suggest that electronic SCM (in their discussion electronic relates to the use of the Internet) combines the structural benefits of SCM with the efficiency benefits of an arms-length approach, enabling, for example, lower cost through possibilities of selecting from a larger supplier base.

The classic work of MALONE ET AL. (1987) proposes that the values offered by ICT are electronic communication (speed of communication), electronic brokerage (by ICT providing a "lean", automated intermediary for resolving market transactions), and electronic integration (coupling of processes).

Many conceptual papers have addressed the value of ICT in SCM (BOWERSOX AND DAUGHERTY 1995, CROSS 2000, LEVARY 2000, VAN HOEK 2001, LEE AND WHANG 2001A, HAUSEN 2005, FRITZ AND HAUSEN 2008). For example LEVARY (2000) suggests that ICT in SCM provides a reduction of cycle time, reduction of inventories, minimization of the bullwhip effect, and improvement of effectiveness of distribution channels.

LEVIS (1996) argues that e-commerce contributes to economic efficiency in five important ways. They are as follows:

- Shrinking distances and timescale;
- Lowering distribution and transaction costs;
- Speeding up product development;
- Providing more information to buyers and sellers;
- Enlarging customer choice and supplier reach.

International e-commerce

The two most powerful forces affecting the world economy and commerce today are the increasing rate of globalisation and advances in ICTs.

In recent years, the exponential growth in ICTs and the resulting rapid emergence of EC have drastically been reshaping the business world. The EC now has reached a phase of change where a revolutionary idea becomes more evolutionary in nature (LEE AND WHANG 2001B). The progression of the ICT has reached the international business.

International e-commerce, as a subset of total e-commerce, generally involves an online commitment to import or export goods and services (GAO 2002).

The entry of consumers into international e-commerce is made possible by the direct, interactive interface that the Internet or any other networks create between producers and merchants of goods and services on the one hand, and consumers on the other.

The fact is that international electronic commerce is one of the primary growth industries of the world economy. This reality is expected to have a number of important consequences, including a substantial reduction of transaction costs, lower prices, enhanced productivity, and more intensive competition (MAROSSI 2006).

In essence, EDI, Internet, ICT, e-business and e-commerce can support organisational structural change on a virtual or global scale. It enables companies to be more efficient and flexible in their internal operations, to work more closely with their suppliers, and to be more responsive to electronic markets, i.e. to meet the demands and expectations of their customers. It also allows companies to select the best suppliers regardless of their geographical location and to sell to a global market.

The benefits mentioned above which can promote the adoption of IT-tools and e-commerce are presented in general and not subdivided into sectors since these can be applied to the agri-food sector as well.

2.4.4 Barriers to adoption of e-commerce

Overall, as mentioned above, the range of benefits that can be achieved from the usage of ICT and e-commerce in SCM is extensive, although there are barriers existing as well.

Why is it difficult to adapt B2B e-commerce?

Exploring the literature, a considerable number of different barriers to e-commerce can be identified, each having been categorized based on the authors' particular point of view.

For example, STOCKDALE AND STANDING (2004) subdivide barriers into four categories:

- Lack of resources and knowledge;
- Skill levels of employess;
- Security concerns;
- Readiness of small business.

CRAGG AND KING (1993) also grouped barriers into four categories:

- Education;
- Management time;
- Economic concerns;
- Technical know-how.

HADJIMONOLIS (1999) classified them into two generic types: internal and external. The internal barriers he divides into resource barriers (lack of management and technical expertice) and system barriers (EC not fitting with the current business practice). The external barriers are also categorized into supply barriers (difficulties in obtaining finance and technical information), demand barriers (e-commerce not fitting with the products/services) and environmental barriers (security concerns).

Another barrier to IT adoption is the cultural factor. Stakeholders with different organisational sub-cultures, who have different views of how EDI systems should be used, can potentially hinder the use of B2B e-commerce among trading partners. For example, BARRETT (1999) examines the four-year adoption of EDI in the London Insurance Market and explains that the different cultural expectations of technology use can potentially impede EDI implementation. As a result, the companies involved in EDI-based e-commerce are often incapable of overcoming the limits of their different cultures.

A major barrier to increasing adoption remains: lack of trust in e-commerce (VAN AKKEREN AND CAVAYE 1999, BODE AND BURN 2002, FRITZ ET AL. 2007).

An essential topic in previous research is trust in e-commerce as a means for efficiency improvements in food networks (HAUSEN ET AL. 2006). CANAVARI ET AL. (2005), FRITZ ET AL. (2007) study the generation of trust for e-commerce. FRITZ (2006) develops a due diligence for e-commerce to facilitate flexible partnering in food networks.

In the literature for trust research several authors (TAN AND THOEN 2001, FRITZ ET AL. 2007, PENNANEN 2005) describe different trust models with integration of different factors affecting

the trust. Next, the importance of the e-trust, defined as trust in the online transaction will be explained. The case of trust in the traditional trade and its influence on the business relationship will be presented in-depth in Chapter 3.

Trust is the prerequisite for many online interactions (DAGUSTA 1988, GAMBETTA 1988, GULATI 1995, MOORMAN ET AL 1993).

According to GEFEN AND STRAUB (2003) "*Trust is especially important in an online environment when all consumers have to go by a computer system embedded in Web pages*". Lack of trust is a key factor for not purchasing from an online vendor (BHATTACHERJEE 2002). According to HOFFMAN ET. AL (1999) "*consumers simply do not trust most Web providers enough to engage in relationship exchanges with them*". HOFFMAN ET. AL (1999) further concluded 95% of Web users surveyed decline to provide personal information over the Internet. Various studies have identified the antecedents of website trust. Both BHATTACHERJEE (2002) and GRABNER-KRAUTER AND KALUSCHA (2003) provide extensive reviews of empirical studies on trust in e-commerce. However these studies do not consider the element of culture related to trust. Instead, research has generally examined customer trust in an online environment regarding how technology and business practices can affect initial trust formation, as well as sustains the continuous development of trust (CHEN AND DHILLON 2003, DONNEY AND CANNON 1997, LEE AND TURBAN 2001).

The requirements in the Internet are higher than in the real world. Offline transactions are for example often as safe or even less safe than such in the electronic trade. The people simply feel more uncertain in the Internet and trust this medium less. Keen says: „*Safety is a perception - a sense of personal comfort. Although credit card fraud on the internet is much lower than for transactions in the offline world, if people don't feel safe, no amount of statistics or claims will change that perception.*" Thus online trust is far more difficult to manufacture than trust with traditional co-operation (KEEN 2001).

This difference also lies in the fact that personal contacts are missing from electronic trade. These face-to-face contacts are very relevant for the structure of trust with business relations. Relations in e-commerce can be combined with such contacts, but often the spatial distance and the time pressure proves an obstacle to that. In particular, the advantages of fast, simple and cheap business are destroyed when face-to-face contacts are established nonetheless. (EGGS 2001, WALLACE 2001).

In addition, the recentness of the technology has to be taken into account as new technologies are known to initially disconcert people. The adjustment period for such important changes is not to be underestimated. Experiences must be collected with the buyer as well as with the seller, and perceived risks of the consumers have to be gradually reduced. Building trust in new technologies and their applications is a very sophisticated process and requires great attention (BEN-NER AND PUTTERMAN 2002).

Business relations with culturally different persons who do not know each other and unknown Internet suppliers who do not possess a physical shop, are not straightforward, simple purposes, which are easy to trust. Skepticism and uncertainty are not easy to eliminate in this surrounding field.

The risk and uncertainty create a new and additional information asymmetry that leads to a lack of trust in e-commerce and in particular in the agri-food sector, where the transaction costs were perceived as too high for agri-food companies to engage in e-commerce.

Additionally, in the agri-food sector, a plentitude of information asymmetry exists due to the characteristics of the food products, which may only be analysed after use (experience characteristics), others cannot even be examined at all (credence characteristics). Based on this statement, it can be explained why the quality management, quality control, contracts and trust between transaction partners are crucial elements in agri-food transactions (FRITZ ET AL. 2007).

The barriers for the adoption of e-commerce are larger than the benefits mentioned above.

However, these can be reduced by examining their causes.

This chapter has presented the general theories of supply chain and supply chain management, literature specially focused on the impact of e-business on it and finally, a review of literature available on business relations. The purpose of this literature review is to show how this thesis and its results are linked to the body of knowledge.

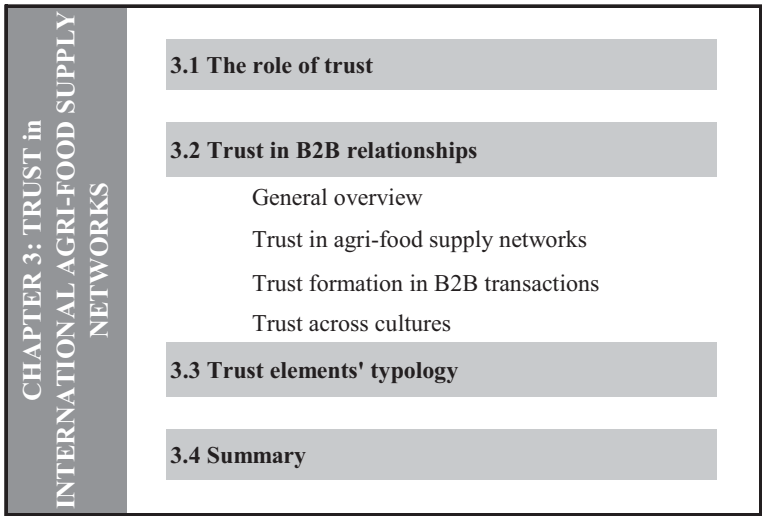
SCM illustrates the increased importance of strong and close business relationships, seamless design of supply chains and the impact of e-business on it to manage its operations generally as well as specifically in regard to economic efficiency. Therefore, this chapter has elaborated a deeper explanation of SCM and concepts within it.

3 TRUST IN INTERNATIONAL AGRI-FOOD SUPPLY NETWORKS

This chapter focuses on the knowledge to understand trust and its importance for the B2B relationships in the supply networks. A literature review provides an assessment what trust is in general and in the particular case of B2B transactions as well as its meaning to the agri-food sector.

First trust is defined, and an overview of the different research aspects of trust is given. Second the view is narrowed down to trust in B2B transactions and a closer look at the generation of trust, trust in the agri-food sector and trust across cultures is provided. A discussion follows on which elements can influence the trust. At last a summary of the chapter as well as deficits in the literature are presented (see Figure 3-1).

Figure 3-1: Overview of Chapter 3 "Trust in international agri-food supply networks"



Source: Own elaboration

3.1 The role of trust

In this subchapter general information about trust is provided and its definition related to different disciplines is put together.

The concept of trust, its importance and its influence on human behaviour has been studied by researchers from across a wide spectrum of intellectual disciplines.

Sociologists (e.g. GAMBETTA 1988, LUHMANN 1979), psychologists (e.g. DEUTSCH 1962, SATO 1988), organisational behaviour scientists (MISHRA 1996, SITKIN AND ROTH, 1993), as well as economists (SAKO 1992, WILLIAMSON 1993), political scientists (BARBER 1983) and information systems researchers (GEFEN 2000, MCKNIGHT ET AL. 2002A) have contributed to the wide body of work that exists on this topic. Not one unique concept has been agreed upon. However, one often used basic definition of trust is that it is belief that the other person (trustee) will not betray the trustor (BAIER 1986, CUMMINGS AND BROMILEY 1996, MAYER ET AL. 1995). From this definition it could be understood that there is someone that trusts and something that the trust is aimed at.

An additional trust definition is given by sociologists. They see trust in context of interaction between two individuals or organisations. Research in this case focuses on factors which

influence trust in these relationships and add a positive or negative value on trust. The sociologist LUHMANN (2000) defines trust as:

"An expectation into the future behavior of others and a mechanism to reduce complexity in a social decision situation and emerges after positive personal experience".

This definition points out that trust is a belief of what other people promise to do in the future. The belief is that e.g. a business partner will act in the way the other party expects him to do. Because of this expectation control has become dispensable. Time and resources are saved – as a result the complexity of a decision situation is reduced. Furthermore the definition points out that this belief can increase after at least one positive personal experience. The more positive experience concerning this decision situation is gathered the easier and stronger the feeling of trust becomes. In the same way it means that trust without or with less positive experiences.

Trust can be explained using different aspects, characteristics, related terms or antecedents. Trust is often related to **benevolence** (DONEY AND CANON 1997, LEWICKI AND BUNKER 1995), **competence** (GIFFIN 1967), **confidence** (COOK AND WALL 1980, DEUTSCH 1958), **cooperation** (GAMBETTA 1988), **integrity** (HERZBERG 1988) and **predictability** (ROTTER 1967, GABARRO 1978).

Trust can also be split into specific concepts such as e.g. **interpersonal trust,** which analyses trust between persons (GOOD 1988, ROTTER 1967), **institutional trust,** which defines trust concerning e.g. the government in the form of an institution (LUHMANN 1979, ZUCKER 1986), and **dispositional trust,** which researches the strength and the ability to trust anyone**,** also in cultural and social context (HOFSTEDE 1980, ROTTER 1967). Trust can be differentiated depending on the object that should be trusted. HOFSTEDE 2006 provides anonther division by separating into **intrinsic** and **enforceable trust.**

As shown above there is a large diversity of aspects researchers address in their trust definitions and also the diversity dimensions of trust itself. The most often cited author on trust is MAYER ET AL. (1995), and his is the so-called *grammar of trust* (MCKNIGHT AND CHERVANY 2001). Their definition is one of the most suitable for this thesis due to its most individual-related definition of trust.

In the description of trust, a lot of key words arise like "trustor" in the definition of MAYER ET AL. (1995). The most important key words are:

- **Trustor**: the person who trusts the other individual or party;
- **Trustee**: the person who is trusted;
- **Trustworthiness**: a person or object which can be trusted.

These key words help to describe trust in relationships by defining clearly which party is the one that wants to be trusted and which party is the one that trusts.

In summary, trust is an intangible term describing a sort of attitudes relating to a relationship between two individuals or between an individual and an object. Trust also exists between an individual and an organisation e.g. government, institutions or companies. Trust is a very complex and multi-dimensional concept, which is very subjective and context-specific. A single ultimate definition of trust does not exist, and academics from various disciplines acknowledge this. Hence it is essential to focus on the specific situation. In this thesis the scope is the B2B relationships and therefore trust has to be defined towards B2B transactions which are coming up in the next subchapter.

3.2 Trust in B2B relationships

3.2.1 General overview

As presented in the section above, trust is also researched in context of economy. For economists trust has a high value for the business processes and their reasons are denoted in following. Different branches of the economy, particularly the New Institutional Economy have developed different trust definitions (SELL 2002). In order to obtain a view of the economic dimension of the trust, researchers have approached this phenomenon on the basis of the Principal Agent Theory (SELL 2002). A Principal Agent relationship is characterised by the fact that a client (Principal) and a contractor (Agent) act on imperfect information and thus interact in an uncertain environment. The agent meets the execution of an order decision, affecting not only its own use level but likewise that of the principal. The principal-agent relationship describes a situation by an asymmetrical information distribution, different trackings and risk attitudes as well as certain individual use maximizations (KALUZA et al. 2003).

Trust is a fundamental relationship model building block and as such is included in most relationship models. Most definitions of trust involve a belief that one relationship partner will act in the best interests of the other partner. Below are four of the most often cited definitions of trust.

In the case of B2B transactions trust can be observed as a *mechanism that limits uncertainties of firms about the future behavior of exchange partners* (LUHMANN 1979) and as *a generalized expectancy towards the behaviour of others that reduces the complexity of decision situations* (LUHMANN 2000).

Trust is the belief that the partners will act in ways that will bring positive outcomes for the firms and does not want to take unexpected actions that may bring a negative outcome (ANDERSON AND NARUS 1990). Trust (MOORMAN ET AL. 1993) is the willingness to rely on an exchange partner in whom one has confidence. Or trust is seen as a belief, a sentiment or an expectation about an exchange partner and results from the partner's expertise, reliability and intentionality. Trust is the extent to which the buyer believes that the supplier has the necessary expertise to perform the activity effectively and reliably (GANESHAN 1994).

Working on developing a trustworthy exchange site is important for several reasons:

- trust is required for a willing transactions, and without it, no market could function (ZUCKER 1986);
- trust creates more favorable attitudes towards suppliers as well as customer loyalties (SCHURR AND OZANNE 1985);
- trust "helps partners project their exchange relationships into the future" (DONEY AND CANON 1997);
- trust enhances competitiveness, reduces transaction costs and mitigates opportunism in uncertain contexts (DONEY AND CANON 1997).

A successful relationship is characterised by mutual trust (CORBETT ET AL. 1999). Companies that trust each other generate profit, serve customers better, and are more adaptable (CORBETT ET AL. 1999). The nature of trust comprises dependability, faith, and fairness. However, trust is not

only positive; it is also deceptive since companies tend to believe that associates they trust also trust them as well (KUMAR 1996, SAHAY 2003). KUMAR (1996) further argues that successful relationships should be flexible, informal, and based on trust instead of based on long and detailed contracts. The conclusion is that trust is stronger than fear (contract).

MORGAN AND HUNT (1994), drawing on "The Commitment-Trust Theory", mention that "*when both commitment and trust – not just one or the other – are present, they produce outcomes that promote efficiency, productivity and effectiveness".*

Therefore, if reducing transaction costs is the objective of an economic arrangement, this can be achieved by building long-term 'channel relationships' based on trust and commitment. Transparency and openness between the partners help lessen the appeal of essentially short-term alternatives in favour of the long-term benefits, and reduce uncertainty. Such conditions of cooperative behaviours will result in awareness, trust, efficiency, transparency and rewards. The basis is internal choices informed by a more complete understanding of the implications of transaction alternatives in both the short and the long run.

In summary, trust plays an important role in B2B relationships and is influenced by diverse factors. Which influence factors can be significant for trust formation in food sector is described in the following section as a special situation of trust in food sector.

3.2.2 Trust in agri-food supply networks

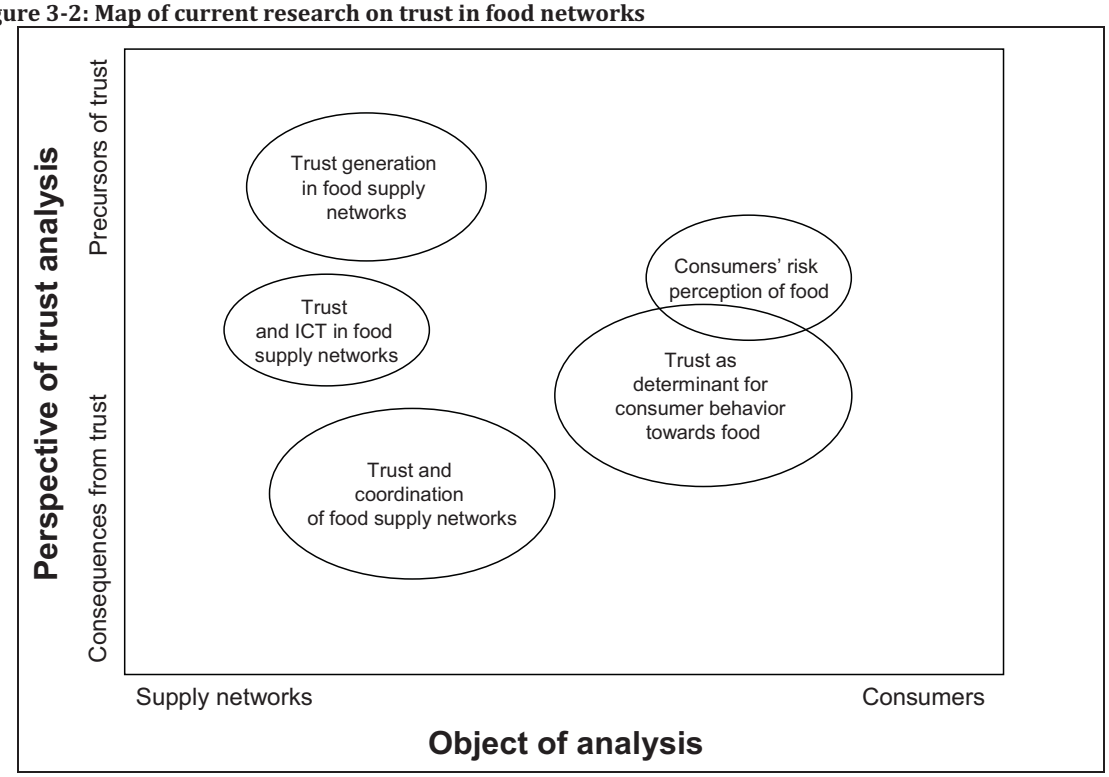
Transactions in agri-food business are predetermined to have information asymmetries about the product quality because it is difficult to define food quality (FRITZ AND CANAVARI 2007). Food transactions also imply a high possibility for opportunistic behaviour or mistakes of the seller and increase the perception of uncertainties and risks (FRITZ AND NOELL 2007). In long-term relationships previous experiences have already generated trust. In later phases of relationships trust in food transactions can be regarded as a supplement or a kind of substitute for communication, controls and safeguards (FRITZ AND NOELL 2007, KRIEGER AND SCHIEFER 2007).

But regarding a new supplier the situation is different. It is a risk for the buyer to work with unknown suppliers. During the beginning of a transaction process the foreign sellers of agri-food products try to communicate their trustworthiness using trust-forming factors. Trust between transaction partners increases the efficiency of food transactions as it lowers transaction cost by reducing required resources for controls and inspections.

The map shown in Figure 3-2 gives a better understanding of the current studies of trust in the food sector. Two dimensions are related in this map that have been assigned to the approach, first the perspective on trust analysis and second the object of analysis in food networks. The dimension "**perspective on trust analysis**" provides the analysis of precursors of trust in food networks and the analysis of consequences from trust to the food system. Regarding this dimension, the research varies from the study of elements influencing the emergence of trust in individuals to research analysing the impact of trust on the structure and processes in food networks. The other dimension "**object of analysis**" is appropriate to the actors in food networks. The research classifies the analysis of companies and business networks on a structural and behavioural level to the study of consumer behaviour.

Another study provides research on trust formation in the food sector and which factors influence it. For the formation of trust in food supply transactions, companies communicate trustworthiness through brands, quality certifications, transparency, guarantees or personal contacts (FRITZ AND NOELL 2007). For a better understanding of trust formation in food business transaction FRITZ AND NOELL advance the generic transaction trust model of TAN AND THOEN (2001) for the case of food supply networks.

Figure 3-2: Map of current research on trust in food networks



Source: Fritz 2007a

The Table 3-1 shows this development which considers the criteria, sources and objects of trust for transactions in food supply. The trust criteria are divided into subjective criteria and objective criteria for the sources and objects of trust, the transaction partner and their control mechanisms. Subjective criteria concerning the transaction partner are experience-based criteria like the impression of the companies' representatives, product samples, past transaction experience and past personal experiences that cannot be verified via control mechanisms. Criteria that are due to cognition-based understanding like product warranty, product description, common culture, company information, transaction contracts, logistic warranties, transaction support, tailored transaction process that are checkable by information on production processes and information on transaction settlings and community-based criteria like transaction partner's reputation and products reputation that cannot be checked through using control mechanisms. Objective trust criteria are commonly accepted indicators like recommendation by associations or public institutions which can be ascertained through accepted signs for quality of production processes and compliance with legal requirements.

This approach highlights that there are many trust criteria, which cannot be signaled by control mechanisms as they are based on experiences or the trustor's personal threshold. In contrast

some factors can generate trust before a personal experience has been made. Furthermore the Table 3-1 gives an overview of the trust criteria in food supply transactions.

Table 3-1: Trust generation in food supply transaction

Trust criteria / Sources and objects of trust		Transaction partner	Control mechanism
Objective trust crit.	**Commonly accepted indicators**	Recommendation by associations or public institutions	Accepted sign for quality of production processes Compliance with legal requirements
Subjective trust criteria	**Experience-based**	Impression of company's representatives; Product sample Past transaction experience Past personal experience	-
	Cognition-based understanding	Product warranty Product description Common culture Company information Transaction contracts Logistics warranty Transaction support Tailored transaction process	Information on production processes Information on transaction settling
	Community-based	Transaction partner's reputation Product's reputation	-

Source: Fritz and Noell 2007, see also Fritz et al. 2006, based on Tan and Thoen 2001

Factors that are highly influential in trust formation in the food sector without experiences in search for new suppliers are presented later, in subchapter 3.3.

3.2.3 Trust formation in B2B transactions

The formation of trust in B2B transactions is of particular interest in this section. The concept of trust has to be used effectively to save costs and strengthen competitiveness as presented above.

The trust formation in B2B transactions is affected by many factors. Trust in transactions is multidimensional (FRITZ AND CANAVARI 2007). The personal attitude developed by experiences, character traits and social and cultural influences are highly relevant for the generation of trust (HOFSTEDE ET AL. 2007). One essential factor which can have an influence on trust formation in B2B transaction is the stage of the relationship. The length of the relationship influences the trust by the increasing experiences. The beginning stage is responsible for whether sufficient

trust is generated for a first transaction or not (LUHMANN 2000). Therefore trust is different in every stage of relationship between business partners.

FORD (1990) classifies five stages in a B2B relationship which are as follows:

- The pre-relationship stage;
- The early stage;
- The developing stage;
- The mature relationship stage;
- The declining relationship stage.

For trust formation in B2B transactions the first two stages are of major importance, and the thesis focuses on these. The risk of being vulnerable is at its highest level (HOFSTEDE ET AL. 2007). Positive evidence resulting from successfully completed transactions is not yet present. In other words, the often mentioned experiences that are highly important for trust formation (LUHMANN 2000) are still missing. But somehow trust formation has to be initiated.

In the pre-relationship stage possible business partners are starting to check if the other party could be an eligible candidate as a business partner. Cooperation problems are of high relevance (HOFSTEDE ET AL. 2007). The enterprises' representatives have to communicate the interests and check if the possible partner fits with their expectations. In the pre-relationship stage the risk of opportunistic behaviour is to be overcome, and involved companies' interests are to be aligned. One precondition for trust formation is a good reputation of the business partner. Before the start of contact the trustor is going to check on this factor first. Experiences of other persons are used to get an idea of the trustee's trustworthiness in earlier cases. Another important factor in all stages is the communication of the trustee (HANF and DAUTZENBERG 2006). Being upfront, signaling commitment, honesty and cooperativeness are key issues for creating trustworthiness in B2B transactions (HOFSTEDE et al 2007).

In the next stage, the early stage of relationship, the coordination problems are dominant. According to HANF and DAUTZENBERG (2006) three major uncertainties can occur:

1. An information asymmetry concerning the product quality;
2. The uncertainty of the behaviour of the transaction partner;
3. A lack of knowledge concerning the transaction performance (decision rules, feedback procedures).

To overcome these problems, the factor communication becomes highly relevant again. Concerning the product quality, certificates of participation in quality assurance systems can help strengthen trust in the transaction partner.

In later stages of the relationship, like the mature stage, the business partners are supposed to have a closer relationship with a higher level of trust and satisfaction (SELNES 1998) due to positive experiences. The constant reliability of the trustee is of high importance. In fact trust

becomes easier. But it cannot be taken for granted. One negative experience can destroy trust immediately (HOFSTEDE ET AL. 2007).

Irrespective of the stage of the relationships, trust formation in transactions is highly dependent on the trustor, the trustee, the transaction and the transaction object itself.

Trust formation can also be influenced concerning the **object of the transaction**. The object in case of a supplier–buyer relation could be a commodity or a supply of services. Regarding commodities there can be a higher or a lower risk potential of an incorrect supply e.g. commodities like plastic materials vs. supply of fresh fruits. The evidence from inspections and certifications of the object of the transaction influence trust formation as well as what others may have said about the attributes of the commodity (HOFSTEDE ET AL. 2007).

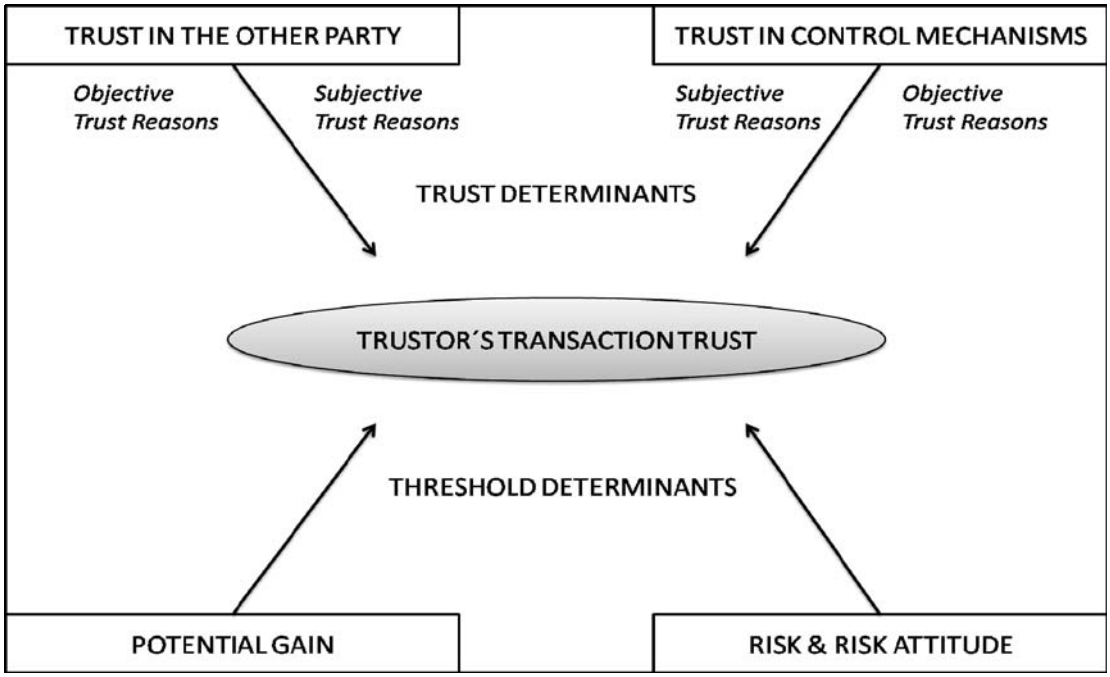
Another point to focus on in trust formation in B2B transactions is the **transaction** itself and here especially the first performance of the business partner during the initial transaction. This first transaction can set the positive impression of the trustee, disappoint the trustor if the trustee e.g. does not cooperate as discussed during negotiations or cannot convince him in case of any doubts. Examples are: the supplier fulfills the appointments of delivery or shows competence in problem solving. In case of fulfilling the demands the belief in the integrity and credibility grows stronger. A successful transaction can be regarded as a proof of trustworthiness.

A model for describing trustor's trust formation in transactions is compiled by TAN AND THOEN (2001). It is based on the assumption that the trustor will only engage in a transaction if his level of trust exceeds his personal threshold or expectation. This threshold is influenced by the type of transactions and the behaviour of the trustee involved. This model focuses on the trustor's trust in a transaction. TAN AND THOEN (2001) define transaction trust as *the mental state of the trustor that determines whether he has sufficient trust to engage in a transaction.* On the one hand the transactional trust level is dependent on the trustor's threshold. This threshold is influenced by the risk potential and the risk perception of the trustor as well as potential profits or gains resulting from the transaction. On the other hand it is influenced by other trust-generating factors or determinants. This is the trust in the trustee or in the other party and trust in control mechanisms that deliver proofs of trustworthy behaviour. An overview of this transaction trust model is provided in Figure 3-3.

The factor "trust in the other party" is an important determinant for the individual's trust level. This factor is an essential part of many trust definitions. The reasons to trust in the other party are separated into subjective and objective reasons. A subjective trust reason would be the friendliness and likability of the trustee. Objective reasons are reasons that are checkable and independent from the interpretation and personal opinions, like demonstrations of high quality via product samples. Many researchers emphasise the subjectivity of trust reasons e.g. the willingness of the trustor to trust the other party. Furthermore they include an action perspective in their trust definitions e.g. the trustee signals cooperation by accepting terms of contract, to demonstrate trustworthiness. Another important perspective for the aspect "trust in the other party" is the information perspective. The sharing of information is of high importance

in transactions. The more relevant information the trustor has about the trustee (e.g. reputation), the easier it is to decide whether the trustor is assumed to be trustworthy. In the definition of TAN AND THOEN (2001) these perspectives are summarized as *trust in the other party* or short *party trust*. This trust is subjective and includes a separation of the action and the information perspective (TAN AND THOEN 2001).

Figure 3-3: Generic Trust Model



Source: Tan and Thoen 2001, see also Fritz et al. 2006

For TAN AND THOEN (2001) another notion constitutes the understanding of trust. This is the factor control. The factor control can be regarded as the objective perspective of trust. The duality between the concepts trust and control is emphasised. The concepts can be substitutive or complementary. TAN AND THOEN (2001) argue that trust and control are parallel concepts that supplement each other. However they put emphasis on the fact that not control itself but trust in a control mechanism e.g. application of quality management systems is important for trust generation in transactions. This is called *control trust.* A control mechanism in this context is described as *the procedures that monitor and control the successful performance of a transaction*. For TAN AND THOEN (2001) transaction trust is the combination of party trust and control trust. Both party trust and control trust are constituted by objective and subjective aspects (Figure 3-3). Objective aspects of party trust are social signs (e.g. membership in associations). Subjective trust reasons are intuition and sympathy, personal experiences and the reliance on the assessment of others (reputation). Control trust is influenced by objective trust reasons like control assessments (e.g. based on the use of widely accepted auditing principles, procedures, policies and protocols). Subjective trust reasons for control trust can be the understanding of the control mechanisms and the reliance on a community's judgment.

In summary trust generation in B2B transactions is influenced by many different factors. All these influence factors can be important for trust generation between diferent countries and cultures as well. A description of the special situation of trust across cultures follows.

3.2.4 Trust across cultures

There are plenty of books, papers and articles dealing with cultural differences and their impact on international transactions.

Each country has its own cultural background. Due to the fact that buyer and seller are communicating over a large distance, the hazard of information asymmetry because of cultural differences occurs. Furthermore communication and information sharing (via telephone, internet, e-mail, seldomly face-to-face) could be more difficult due to differing expectations or misunderstandings caused by language problems. A lot more effort during negotiations and coordination stage has to be invested in contrast to a direct contact between business partners in the same country.

Due to the international view of this thesis, the influence of culture will be discussed below. MONSZKA ET AL. (1995) state that cultural differences are a major barrier to international business. The cultural background could have a massive influence on trust generation in cross-border B2B relationships such as food import (HOFSTEDE et al. 2007).

HOFSTEDE ET AL. (2007) suppose that the trust issues arise because of generic causes at the level of human social behaviour. Next, some of these issues are discussed from the cultural perspective. Expectations about trustworthiness differ among societies. More generally, the social game that life constitutes and of which trade is a part, differs across societies. In order to understand trust in cross-country trade networks, it therefore seems appropriate to try and apply cross-cultural findings (HOFSTEDE ET AL. 2007).

HOFSTEDE AND HOFSTEDE (2005) indentified some cultural factors, which have an enornous impact on the efficiency of national economies. The following five factors were identified (HOFSTEDE 2001, HOFSTEDE AND HOFSTEDE 2005):

(1) Power Distance Index (PDI): The extent to which the less powerful members of society accept that power is unequally distributed. Germanic, Scandinavian and Anglo countries have small power distances. Latin countries tend to have rather large power distances. Russia and many Balkan countries have very large power distances;

(2) Individualism (IDV): A high IDV stands for societies where people look out for themselves whereas a low IDV indicates high group orientation. The Anglo countries and the Netherlands are the most individualist societies in the world;

(3) Masculinity (MAS): In „masculine“ societies men are assertive, tough and concerned with material success, and the women are more modest, tender and interested in the quality of life. From a culturally masculine viewpoint, most people should not be trusted. For doing business with an unknown partner, safeguards and contracts are recommended against free riding and other forms of cheating. Large countries with a masculine culture include Britain, Germany, Italy and Poland. The South and East of Europe tend to be more collectivist than the North and West;

(4) Uncertainty Avoidance Index (UAI): The extent to which people feel threatened by uncertain or unknown situations. This is expressed in a need for formality, predictability and

clear rules. Uncertainty-avoiding countries include Balkan countries and all Latin countries. People in uncertainty-avoiding societies are comparatively distrustful of institutions, e.g. of government bodies or of any company they do not know;

(5) Long-Term Orientation (LTO): The extent to which people favor a pragmatic, future-oriented perspective. In a long-term oriented society, people will tend to be entrepreneurial, to invest in business development and to form enduring business relationships. In a short-term oriented society, business contacts will tend to be focused on short-term gains and on loose market relationships. European countries are moderately short-term oriented, with Spain and Britain at the short-term oriented end of the spectrum. France and the Netherlands are rather more long-term oriented.

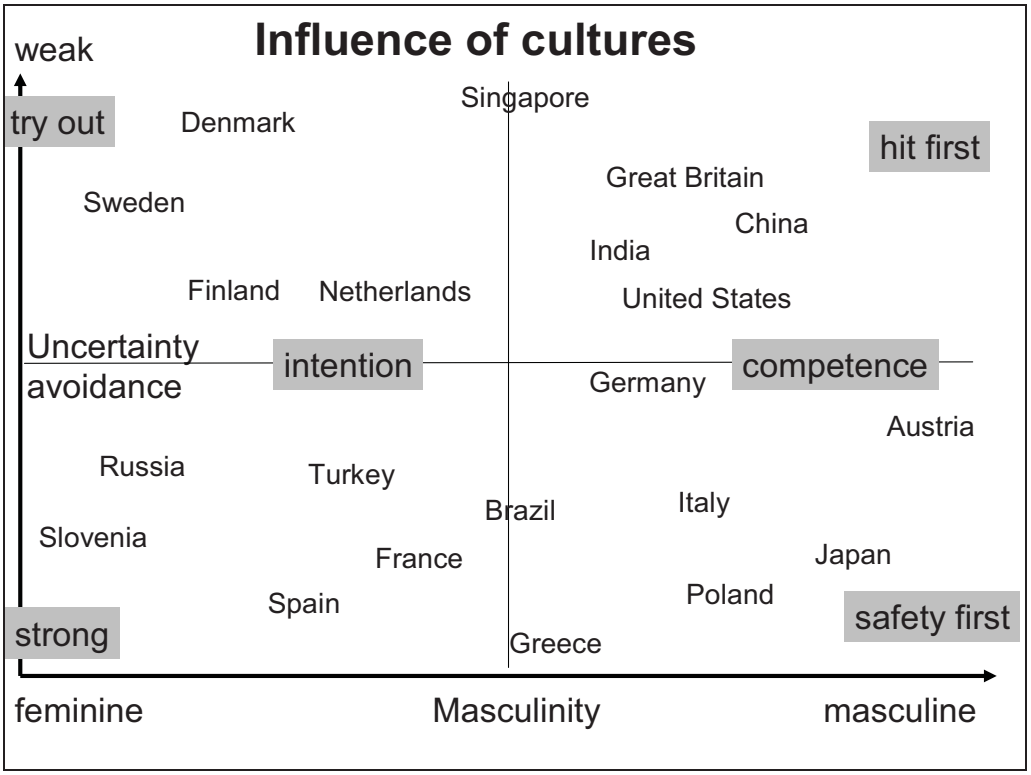
Cultures are characterised regarding their behaviour concerning business transactions as well. HOFSTEDE et al. 2007, HOFSTEDE 2001, HOFSTEDE and HOFSTEDE 2005 have researched the influence of culture in business relationships. One dimension is the differentiation of special cultural behaviour towards business processes into more "masculine or more feminine cultures".

Masculine cultures tend to be more control oriented, have greater needs for safeguards, require proofs and demand strictness concerning infringements (HOFSTEDE et al. 2007).

Countries like Germany, Austria, Italy and Poland tend to act more in the way masculine societies do while Spain, Scandinavian countries, the Netherlands, Portugal and Slovenia are evaluated as examples of feminine culture. These contradictory attitudes can cause problems in trust building by the transactions especially concerning the risky commodity food. *[…] If a business partner from a feminine country misses out on a deal, but there is a good excuse, they expect the other side to show understanding, not to enforce punishment* (HOFSTEDE et al. 2007).

Concerning the formation of trust for German buyers the *suppliers must earn the trust and commitment of their German buyers continually, because control activities also play a major role in non-financially successful buyer-supplier relationship* (KAUFMAN AND CARTER 2000). Germany is classified as a masculine society, which can cause difficulties in transactions with female societies. If the trustee knows which of those culturally specific trust factors are important, he can put more emphasis on those factors. In Figure 3-4 the different cultures based on the influence of **masculinity index** are presented**.**

Figure 3-4: Influence of cultures



Source: Hofstede and Hofstede 2005

Summarising, the cultural dimension can have a massive influence on trust generation and trust between business partners. Knowledge of what the foreign trader expects can facilitate the generation of trust.

3.3 Trust elements' typology

In the literature there are several models which differ in their count of trust-influencing factors and how to arrange these in categories.

In order to point out in the context of this work when and where these factors during the transaction process become effective, the trust model of HOFSTEDE ET AL. (2007) will be covered in this chapter. This model permits conclusions on the formation of trust in the food sector and in the case of searching for a new supplier.

The trust model of HOFSTEDE ET AL. (2007) is recognised as a typology of different elements which can support the building of trust between the traders.

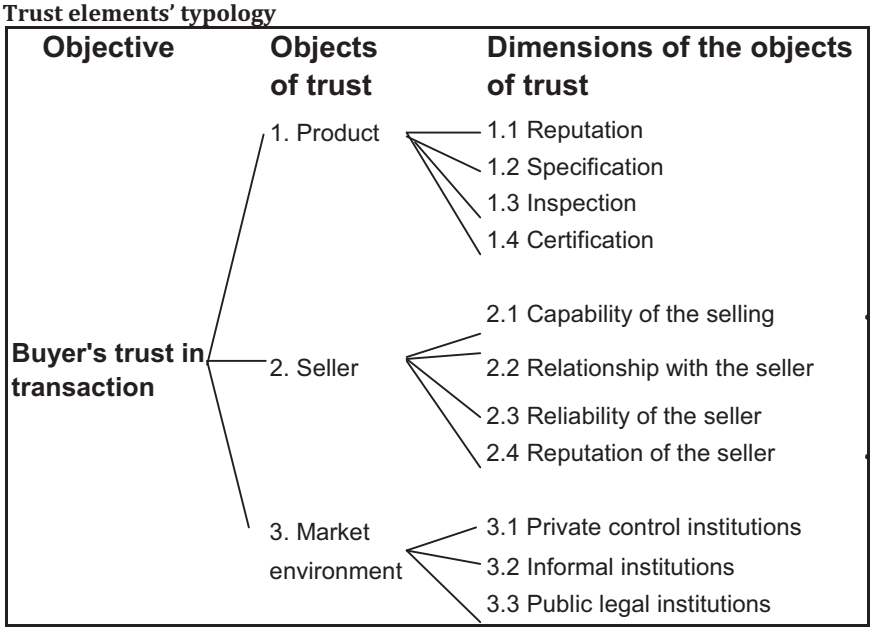
This typology observes eight principles which are as follows:

1. Wide view of trust, including 'control';
2. Focus on food quality and safety attributes;
3. Focus on early stages of B2B relationship;
4. Viewpoint: buyer. Information asymmetry against him;
5. Based on state of the art;
6. Inspired by Analytical Hierarchy Process (AHP) as a method (this method will be explained more into details in Chapter 6);
7. Leaves sensitive to sector differences;

8. Tree accommodates cultural differences.

The trust typology described by HOFSTEDE ET AL. (2007) covers three levels, which are divided in different objects and dimensions (see Figure 3-5). The whole overview of the trust typology is presented in Annex 2 and in next Figure 3-5 only the first two levels.

Figure 3-5: Trust elements' typology



Source: Hofstede at el. 2007

Dimensions of the object "product" of trust

Food has to fulfill high quality standards therefore trust factors must signal this quality. The region of origin of the product, the trade brand and associated qualities like taste can be summed up as the "**reputation of the product"**. A good reputation of the product is one factor that can facilitate trust generation.

Another point is the "**specification of the product"**. This can mean that the product is specified to the intended purpose of the buyer. This can be due to fulfilment of the legal requirements, product safety warranty, production process specification and specification of the origin of raw materials. Especially raw food products are very sensitive. "**Inspection of the product**", in terms of physical examinations, laboratory analysis of product samples and the possibility of visiting the production site, is of high importance to built trust.

"Product certifications" by third seller independent parties like sector specific quality or hygiene codes, HACCP or ISO 9000 of original producer, GlobalGap, BRC, IFS (see also Table 2-1 in Chapter 2 and Annex 1) are proofs of honesty and willingness of the seller to deliver high quality foods and avoid risk factors in his production.

In economic transactions the price is of high importance. A good "**price / performance-ratio"** is required for a successful transaction as it has to be a "win-win situation" for each of the transactions partners. Inappropriately low prices are as suspicious as too high prices. The risks that the food products could be in such a bad condition that they are not worth the money are present in both cases (based on HOFSTEDE ET AL 2007).

In summary, trust-building factors relating to the "product" are:

- Reputation
- Specification
- Inspection
- Certification
- Price / performance-ratio

Dimensions of the object "seller" of trust

The seller and the company behind him are of high importance for the transaction and therefore for trust generation. The seller must signal his "**capability"** to cope with the requirements of a food import transaction. Information is required about: the tracking and tracing systems of the company, on the product capacity and on communication systems and services, e.g. during the transport; these are important facts for generating trust. The possibility of visiting the production site and the company or performing an audit (an examination of the compliance of production standards), certificates and compliance with sector standards can demonstrate the capability of the seller (based on HOFSTEDE ET AL. 2007).

The "**relationship with the seller"** can influence trust generation as well. The behaviour of the seller as an individual is an important factor. This means that kindness, flexibility and the same attitude about things as well as speaking the same language are important factors. Also knowing the partner beforehand, by meeting him in a professional network or through friends and family, as well as the fact that a seller can be a part of the social life (family member or friend) can be of high relevance. The relationship can also be on a company level. In this case the same attitudes towards philosophy of life or work philosophy can be of interest. Also factors like common interests in long-term relationships, the development of common rules for the coordination of a transaction and also the acceptance of these rules are important (based on HOFSTEDE ET AL. 2007).

Trustworthiness of the seller is also expressed by the "**reliability of the seller"**. An adequate communication, which means that the partner responds timely to a request, is required. The reliability means also that important matters are actively communicated to demonstrate reliability. Honest communication about the factor delivery, oral agreements, willingness to sign a contract, logistic warranties and the acceptance of closely monitoring the deliveries are also signals to generate trust. Concerning the reliability factors like the ability of the seller in showing forward thinking to avoid problems and competence in solving problems are proofs of reliability as well. The financial situation of the seller can be another indicator of reliability in terms of a financial report or a financial audit.

Ordinarily the seller has a "**reputation".** Third parties like public institutions, industry associations or purchasing organisations are sources for opinions or recommendations of a buyer. Also recommendations by other business partners or other buyers facilitate trust generation. The demonstration of being a member of a branch or professional associations can also be regarded as a source of trust for a good reputation (based on HOFSTEDE ET AL. 2007).

In summary trust-building factors relating to the "seller" are:

- Capability of the seller
- Relationship with the seller

- Reliability of the seller
- Reputation of the seller

Dimensions of the object "market environment" of trust

The market environment helps to generate trust in adjusting control institutions to guarantee higher food safety and quality controlled by independent parties. There are often quality signs or labels, which imply trustworthiness and control quality safety. A lot of commonly known institutions exist. The seller can participate in several institutions. One possibility for that are "**private institutions"** e.g. QS or Globalgap. The belief in the trustworthiness of these institutions depends on the knowledge and strictness of the checking personnel, the test criteria, the acknowledgement by the business partner, the dissemination of the quality signs and the accreditation.

Another kind of institutions are "**informal institutions",** which are associations or organisations. Their validity and independency is hard to evaluate and depends on the political stability and the social control among operators.

The third kind of control institutions are "**public or legal institutions"** e.g. ISO or HACCP. The successful enforceability of contracts and the reliability of the operators can intensify trust in this institution (based on HOFSTEDE ET AL. 2007).

In summary trust-building factors relating to the "market environment" are:

- Private control institutions
- Informal control institutions
- Public control institutions

It can be summarized that there are a lot of trust-building factors in the decision on new suppliers. It seems to be possible that those factors are all having a different level of importance for individuals or groups. Due to different characteristics of agri-food products, diverse facts can be emphasised to be of higher relevance than others.

3.4 Summary

As already described above, trade transactions and especially the food transactions are influenced by many risks and requirements. Trust can facilitate this situation by reducing e.g. control and communications complexity. In the economic context trust is of high relevance in B2B relationships. In this case trust can be regarded as a facilitator for decision situations, which are indispensable in business transactions. Trust is a dynamic process that must be built over time. Trust generation in B2B relationships is dependent on many factors. Once trust is established, complex control mechanisms could be reduced and transaction costs and time saved. This justifies the economic value of trust. The most difficult part in the stage of the relationships is the performance of trust in the first transactions.

Food transactions can be regarded as a special B2B relationship. Transactions have a lot more requirements and risk compared with other branches. The particular problem in this relationship is rooted in the cross-border aspects, which require an interchange of different

cultures and of course the object of the transaction, namely the food. This product is risky, and consequently various requirements have to be fulfilled. Therefore uncertainties on the side of the traders occur. Trust in the seller is indispensable. Especially the first transaction is of high risk for a buyer of food. Trust formation in the seller can be difficult. Trust generation is highly based on experience but nevertheless there must be factors that generate trust for an initial transaction. Trust factors which are independent from experience in food sector are factors concerning the product, the seller and the control institutions - in other word the market environment.

Based on the literature research and presented key issues about the role and significance of trust, it can be established that there are plenty of approaches to trust, additionally to trust in the traditional trade and trust in the agri-food sector. However, there are deficits in the spectrum of trust and namely how trust can be mediated in e-commerce where the face-to-face interaction is eliminated. Researchers warn that a lack of trust may be the most significant long-term barrier for realizing the full potential of e-commerce (see Chapter 2.4.4).

For instance, some researchers argue that trust might be undermined in electronic interactions and transactions because the reduced communication channel makes it harder to observe non-verbal physical signals, such as facial expressions and body language, which have traditionally been viewed as the primary means used by people to detect dishonesty (see Chapter 2.4.4). On the other hand, there is no definitive research on the impact of different media—audio-only, video, computer-mediated communication and a mix of media—on one's trust in another person involved in interpersonal communication. Moreover, there are arguments that trust can be increased by making effective use of information and new forms of electronic features (see Chapter 3.2, Chapter 3.3). Nevertheless, the trust in B2B can help accelerate the trust-building process for the online environment. Hence, the current thesis examines if there are new opportunities for the transfer of traditional trust into online trust. To achieve the main objective of the thesis a stepwise approach is developed which has been presented in Chapter 1.3 and is investigated in the next four chapters.

4 IDENTIFICATION OF THE MOST RELEVANT TRADE FLOWS WITH A FOCAL POINT ON EUROPEAN COUNTRIES

For the adoption of e-commerce in the international agri-food supply networks, the establishment of trust by electronic means is essential. To achieve this goal efficiently, the major international trade flows of the agri-food products must be identified first in order to analyse the transaction processes. This identification of the most relevant agri-food trade flows serves as the foundation and shows the trading volume in selected countries on which the later research of this thesis is based, with particular consideration of the specific role of trust in these transactions and its transfer in e-commerce afterwards. In this chapter, the focus is on the size of trade flows regarding agri-food products in selected countries on a yearly basis. Thus, the interest is on the amount of agri-food goods exchanged yearly from a certain country to another. In particular, the subject matter of this chapter is the identification of the size of these trade flows.

The outline of this chapter is as follows. First, a methodological approach to the classification of international trade flows is discussed in section 4.1. Subsequently, the following sections describe the selected agri-food sectors; first, a general overview of the appropriate sector is given and, second, the estimated results of the trade flows with a particular interest on import and export data are presented. Finally, section 4.6 provides a summary of this chapter and conclusions (see Figure 4-1).

Figure 4-1: Overview of Chapter 4 "Identification of the most relevant trade flows"

Source: Own elaboration

4.1 Description of data collection and criteria for trade flow analysis

On the one hand, exports are an important source of income for most countries. On the other hand, imports are necessary to compensate for a lack of national resources, to benefit from other countries' comparative advantages, to satisfy consumer demand for foreign products, et cetera. Hence, the analysis of international trade flows is necessary in order to show and to understand whether the country is dependent on resource imports from other countries and to what extent the domestic consumption depends on resources extracted domestically and imported from abroad.

The objective of this analysis is to utilise the statistical data for the identification of the current trading volume in order to identify potential opportunities for enhancing market development.

In order to obtain a database, descriptive research has been conducted using national and international statistics as a source to generate findings on the international trade flows.

For the elaboration of the data collection, mainly the international statistical database of Food and Agriculture Organization of the United Nations (FAOSTAT) is used as a common basis of the comparison. In some cases, the use of more than one dataset is important due to the availability of the required information. Therefore, the following statistical databases are compiled additionally in some cases:

- Federal Ministry of Food, Agriculture and Consumer Protection (BMELV);
- The Federation of German Food and Drink Industries (BVE);
- The central market and price report place LLC (ZMP);
- The German Fruit Juice Industry Association (VdF);
- Federal Statistical Office, Germany.

According to the statistical sources mentioned above, primary commodities are grouped into four categories: **cereals, meat, fruit and vegetables, and olive oil**.

The data of trade from 2005-2006, which is the last year that information has been provided, are grouped by the following countries:

- Within the European Union: **Germany, Austria, Slovenia, Italy, Greece, Spain;**
- Trans-European cross-border: **USA, Brazil and Turkey.**

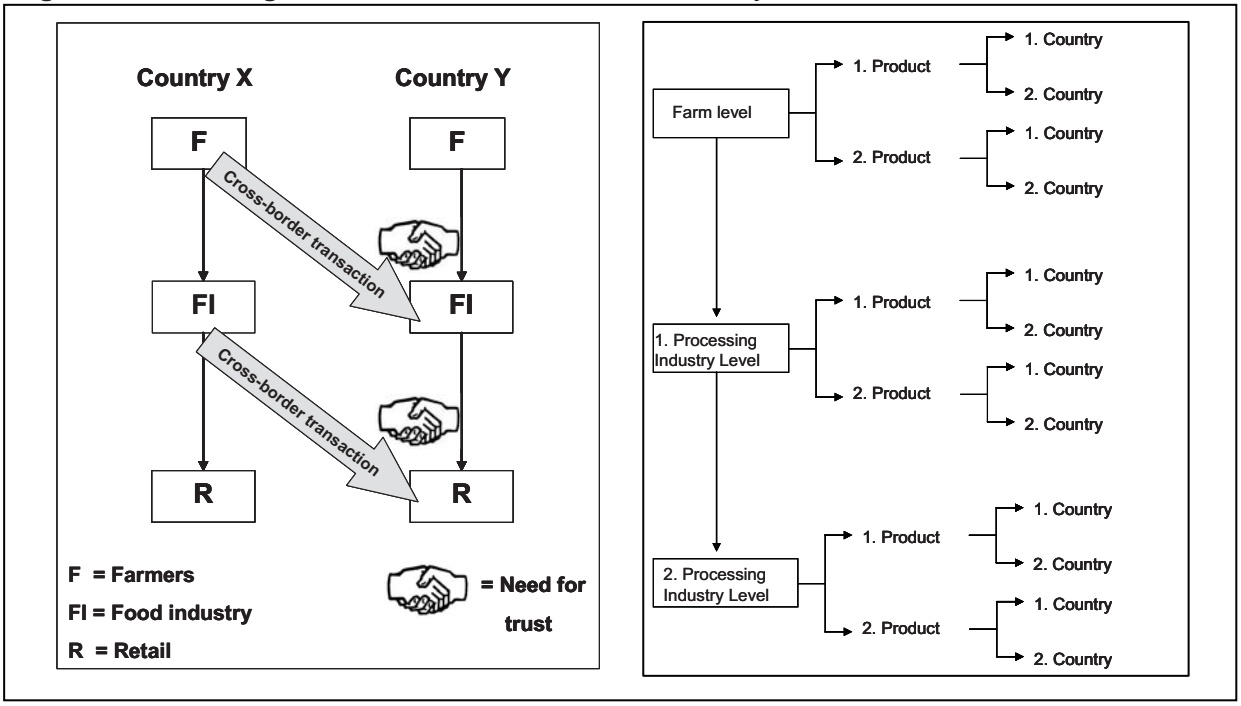
For each of the previously mentioned countries and for the agri-food chains of the four product groups regarding the following criteria, the trade flows are to be identified:

- the two most relevant products for export at every level of the agri-food chain with the two most relevant destination countries;
- the two most relevant products for import at every level of the agri-food chain with the two most relevant countries of origin.

It is important to analyse the trading volume with respect to the imported or exported agri-food products not only on one chain level but rather on all levels. This allows the development of a completed picture in the agri-food supply networks.

Figure 4-2 below presents an example of the international trade flow analysis. This schematic shows the procedure, which will be done for every selected country along the selected agri-food sectors. However, the international trade is determined by import and export volume. Thus, the depicted example is distinguished on the one hand by the **import** side and on the other by the **export** side of the respective country (the right side of the Figure 4-2). The left side of the Figure 4-2 provides the issue that an information assymetry and missing trust can occur between the traders and especially on the buyer side as already mentioned in the preceding Chapter 3. Hence, the trust in the seller is a crucial element in particular in the international trade where cultural differences govern.

Figure 4-2: Methodological schema of international trade flow analysis



Source: Own elaboration

The in-depth analysis of the international trade flows is provided in the following section.
First, the supply chains are analysed by describing in-depth production, consumption and trading issues with a particular interest on import and export data. They are described by zooming in on the single tiers and by an aggregated approach focusing on the whole chain. Each chain study concludes with a specific graph describing statistical data on imports and exports, which are described in more detail in the previous paragraphs on single specific levels.
In order to go deeper into the food trade flow analysis, the focus is on four chains (cereals – meat – fruit and vegetables – olive oil), highlighting the main flows for each level in each chain.

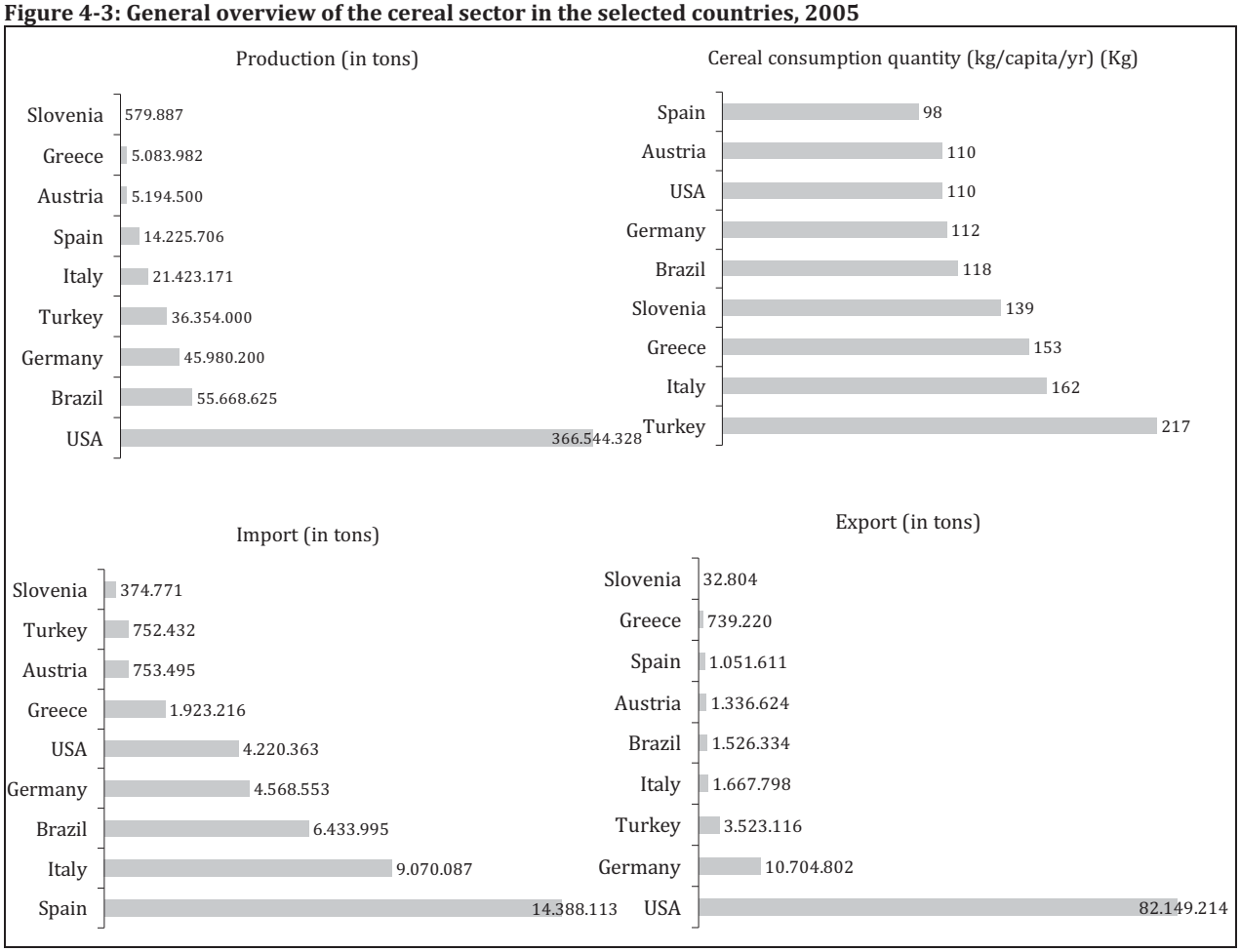
4.2 Trade flows in the cereal sector

4.2.1 General Overview of the cereal sector in the selected countries

In order to estimate the current situation of the cereal sector in the selected countries, in the following subchapter all selected countries are described regarding the following criteria: production, consumption quantity, trading issues with a particular interest on import and export data. The data were compiled from FAO and concern the year 2005 (production, import and export) and the year 2003 (consumption quantity), which are the most current.
In Figure 4-3 below an analysis of cereal production, consumption, import and export in the nine selected countries is presented. The USA produces the largest quantity of cereal products compared to the other eight countries, followed by Brazil and Germany; Turkey, Italy and Spain occupy places four, five and six, respectively. Austria's and Greece's production of cereals is rather similar, and in last place is Slovenia.

In terms of cereal consumption, Turkey has the largest quantity of 217 kg per capita. Spain's population consumes only 98 kg per capita and all other countries have consumption levels between 110 and 162 kg per capita (Austria, USA, Germany, Brazil, Slovenia, Greece and Italy).
Regarding the import and export quantities of cereal products, it can be stated whether the countries are more or less net importers or net exporters.
The major importer is Spain and the major exporter is the USA. Countries like Slovenia, Greece, Brazil and Italy can be identified as net importers. On the other side, Austria, Turkey and Germany are recognized as net exporters.

Figure 4-3: General overview of the cereal sector in the selected countries, 2005



Source: Own elaboration based on FAO 2005

4.2.2 Cross-country analysis of the most relevant trade flows in the cereal sector

After presenting the general overview of the cereal sector in the selected countries above, an in-depth analysis will be carried out. Taking into consideration the whole chain, the analysis defines the two most important exported and imported products for each tier of the supply chain in each country, and it describes the flows for each stage of the chain, taking into consideration the origin and the destination of each flow to and from the respective country. First the situation in Germany will be identified.

Trade flows in the cereal sector in Germany

The most relevant commodities of the **cereal** sector and trade countries for Germany are listed below and shown in Table 4-1.

Raw cereals:

- Imports: maize and wheat.

  While maize comes mostly from France and Hungary, wheat is mostly imported from the Czech Republic and France.

- Exports: wheat and barley.

  The main destinations for wheat are the Netherlands and Belgium. The Netherlands and Saudi Arabia are the most relevant trade countries regarding barley.

Processed cereals:

- Imports/Exports at 1st processing-industry level: flour and malt

  All countries from the European Union are relevant for the import and, except for the Netherlands, the exports' trade partners are from third countries, e.g., Russia, Japan and Libya.

- Imports/Exports at the 2nd processing-industry level: beer/pastries

  Denmark, Belgium/Luxemburg, the Netherlands and Italy are depicted as essential import countries considering the commodities. France, Great Britain and Italy are identified on the export site.

Table 4-1: Trade flows in the cereal sector to and from Germany, 2005

	IMPORT				EXPORT			
	Two most relevant Products	**Two most relevant Origins**	**Tons**	**% of total**	**Two most relevant Products**	**Two most relevant Destinations**	**Tons**	**% of total**
Farm-level products	**1. Maize**	1. FR	755.607	48	**1. Soft wheat**	1. NL	1.465.718	25
		2. HU	380.552	24		2. BE	620.753	11
	2. Soft wheat	1. CZ	455.454	38	**2. Barley**	1. SA	687.967	26
		2. FR	247.038	21		2. NL	429.970	16
1. Processing-Industry Level	**1. Flour**	1. FR	23.989	41	**1. Flour**	1. NL	122.772	25
		2. BE	21.115	36		2. LY	120.225	24
	2. Malt	1. FR	137.939	67	**2. Malt**	1. RU	46.410	12
		2. NL	38.336	19		2. CH	41.186	11
2. Processing-Industry Level	**1. Pastries**	1. NL	66.815	18	**1. Pastries**	1. FR	113.138	18
		2. IT	59.546	16		2. UK	75.307	12
	2. Beer (in hl)	2. DK	2.410	44	**2. Beer (in hl)**	1. IT	3.205	24
		3. BE/LU	1.105	20		2. FR	1.842	13

Source: SBA 2008, ZMP 2007, FAOSTAT 2008a/b/c, DBB 2007, BMELV 2007

Trade flows in the cereal sector in Austria

The production of cereals is of high importance in Austria. The export and import trade flows of raw materials are influenced by geographical distances and historical roots. Therefore, Hungary, Germany and Italy are the most important trading partners in the supply chain of cereals. On the farm level and the level of the raw-products trade sector, Austria mainly imports maize and

wheat from Hungary. It is noticeable that Austria imports these products more cheaply than it exports them. The main export partner on a farm level is Italy. The first level of processing imports and exports of commodities is only of marginal importance for the processing industry, only small quantities are traded. One reason may be the fact that the majority of bakeries in Austria are small companies – these bakeries still purchase on a regional level. Furthermore, products on the first level of processing are low-priced products. Longer transport distances are therefore avoided. In addition, purchase decisions are influenced by a trend towards regionalization, a trend primarily initiated by the market-dominating retail chains. Wheat flour and malt flour are mainly imported from Germany; the two most important exported products are malt flour and wheat flour, which are exported respective to Italy and Bulgaria, and also to Hungary and Germany (see Table 4-2).

Table 4-2: Trade flows in the cereal sector to and from Austria, 2005

	IMPORT				EXPORT			
	Two most relevant Products	**Two most relevant Origins**	**Tons**	**% of total**	**Two most relevant Products**	**Two most relevant Destinations**	**Tons**	**% of total**
Farm-level products	**1. Soft wheat**	1. HU	133.624	53	**1. Soft wheat**	1. IT	413.817	83
		2. DE	51.060	20		2. DE	37.229	7
	2. Maize	1. HU	329.940	84	**2. Maize**	1. IT	348.808	90
		2. DE	19.197	5		2. DE	27.840	7
1. Processing-industry level	**1. Wheat flour**	1. DE	39.878	80	**1. Malt flour**	1. IT	13.414	23
		2. HU	6.468	13		2. BG	9.657	16
	2. Malt flour	1. DE	21.378	43	**2. Wheat flour**	1. HU	9.691	18
		2. SK	19.530	39		2. DE	7.438	15
2. Processing-industry level	**1. Beer**	1. DE	38.998	65	**1. Beer**	1. DE	12.111	15
		2. IT	626	18		2. IT	10.215	12
	2. Bakery products	1. DE	41.841	79	**2. Pasta**	1. DE	19.897	58
		2. IT	2.875	5		2. IT	5.406	16

Source: FAO 2005

Trade flows in the cereal sector in Italy

Considering the cereals supply chain, Italian supplies for raw materials depend mainly on European countries (France and Hungary), but also on extra-EU partners (Canada is the most important country for the Italian import of durum wheat). As for first-level processed products in the cereal supply chain, wheat flour and maize flour are the most imported raw goods from respectively Spain and France, and Austria and France. Germany plays an important role in the second-level processed products with their imports of pastry and beer into Italy. On the export side rice, wheat, wheat flour and maize, pasta and pastry are the most essential products of all

chain levels. Relevant destinations are France and Germany. More details are provided in the Table 4-3.

Trade flows in the cereal sector in Slovenia

The largest proportion of imports to Slovenia goes to maize from Hungary and Macedonia and to wheat from Hungary and Austria. The geographic conditions play an essential role in the import of processed products, which means that the largest quantities are from Italy and Austria. Italy is an important trading partner of Slovenia from the export side as well, and the largest quantities of maize and barley go there. Export products of the first and second processing level are not relevant on the quantity side; therefore, they are not considered in this analysis. The detailed statistical data is shown in Table 4-4.

Table 4-3: Trade flows in the cereal sector to and from Italy, 2005

	IMPORT				EXPORT			
	Two most relevant Products	**Two most relevant Origins**	**Tons**	**% of total**	**Two most relevant Products**	**Two most relevant Destinations**	**Tons**	**% of total**
Farm-level products	1. Maize	1. FR	430.800	34	1. Rice milled	1. FR	119.604	19
		2. HU	242.841	19		2. DE	84.985	13
	2. Durum wheat	1. FR	1.730.844	26	2. Wheat	1. DZ	46.714	33
		2. CA	815.185	12		2. TN	19.834	14
1. Processing levels	1. Wheat Flour	1. ES	5.157	31	1. Wheat Flour	1. LY	241.207	46
		2. FR	4.226	26		2. CU	147977	28
	2. Maize Flour	1. AT	909	46	2. Maize Flour	1. IL	25.840	15
		2. FR	707	36		2. EG	23.543	14
2. Processing levels	1. Pastry	1. DE	51.264	40	1. Pasta	1. DE	330.255	22
		2. FR	21.275	17		2. FR	202.844	14
	2. Beer of barley	1. DE	295.493	56	2. Pastry	1. DE	57.090	20
		2. DK	49.631	9		2. FR	54.129	19

Source: FAO 2005

Table 4-4: Trade flows in the cereal sector to and from Slovenia, 2005

	IMPORT				EXPORT			
	Two most relevant Products	**Two most relevant Origins**	**Tons**	**% of total**	**Two most relevant Products**	**Two most relevant Destinations**	**Tons**	**% of total**
Farm-level products	1. Maize	1. HU	122.122	88	1. Maize	1. IT	26.712	99
		2. MK	8.053	6		2. HR	443	2
	2. Wheat	1. HU	97.340	82	2. Barley	1. IT	1.710	99
		2. AT	8.898	7		2. RS	13	0,75
1. Processing-industry level	1. Maize Flour	1. RS	5.106	58	non-relevant export			
		2. IT	3.603	41				
	2. Wheat Flour	1. IT	8.268	40				
		2. AT	8.220	40				
2. Processing-industry level	1. Pastry	1. IT	2.966	18				
		2. HR	2.848	17				
	2. Beer of barley	1. DE	8.635	45				
		2. AT	4.565	24				

Source: FAO 2005

Trade flows in the cereal sector in Greece

Regarding the cereal sector, Greece is an import-dependent country. More specifically, in the cereal sector Greece is importing mainly from Russia, France, Hungary, Italy and Germany. On the export side, Italy remains a very relevant trading partner. For more details see Table 4-5.

Table 4-5: Trade flows in the cereal sector to and from Greece, 2005

	IMPORT				EXPORT			
	Two most relevant Products	**Two most relevant Origins**	**Tons**	**% of total**	**Two most relevant Products**	**Two most relevant Destinations**	**Tons**	**% of total**
Farm-level products	**1. Soft wheat**	1. RU	295.861	33	**1. Hard wheat**	1. IT	122.844	62
		2. FR	136.600	15		2. DZ	18.241	1
	2. Maize	1. HU	524.002	82	**2. Maize**	1.ES	211.094	50
		2. FR	31.715	0,05		2. CY	110.328	26
1. Processing-industry level	**1. Wheat Flour**	1. IT	7.112	44	**1. Wheat Flour**	1. LY	10.000	40
		2. DE	4.464	27		2. BG	6.112	25
	2. Maize Flour	1. IT	215	42	**2. Maize Flour**	1. MK	1.017	45
		2. USA	87	17		2. RO	924	40
2. Processing-industry level	**1. Beer**	1. DE	21.846	45	**1. Macaroni**	1. IT	18.873	40
		2. NL	14.119	29		2. AL	8.260	17
	2. Pastry	1. IT	9.442	29	**2. Pastry**	1. IT	3.990	20
		2. DE	7.598	23		2. UK	2.903	14

Source: FAO 2005

Trade flows in the cereal sector in Spain

Spain is a country dependent on cereal imports of wheat and maize. The major imports come from the Ukraine and France. The statistical data shows a dependency of Spain on France and Portugal on products of the first and second processing level regarding their imports. On the export side, France and Portugal are identified as very relevant destinations as well. An overview of the other imported and exported products and their origins and destinations is presented in Table 4-6.

Table 4-6: Trade flows in the cereal sector to and from Spain, 2005

	IMPORT				EXPORT			
	Two most relevant Products	Two most relevant Origins	Tons	% of total	Two most relevant Products	Two most relevant Destinations	Tons	% of total
Farm-level products	1. Wheat	1. FR	1.997.240	27	1. Wheat	1. DZ	59.660	26
		2. UA	1.433.975	19		2. PT	56.590	25
	2. Maize	1. FR	2.144.470	50	2. Rice milled	1. UK	18.692	15
		2. UA	322.489	8		2. UAE	15.726	13
1. Processing-industry level	1. Maize Flour	1. FR	90.113	92	1. Wheat Flour	1. LY	91.654	37
		2. PT	3.489	4		2. FR	43.233	18
	2. Wheat Flour	1. FR	19.596	45	2. Forage products	1. PT	64.279	39
		2. PT	16.113	37		2. FR	49.940	31
2. Processing-industry level	1. Pastry	1. FR	37.273	25	1. Pastry	1. PT	48.278	29
		2. IT	35.852	24		2. FR	31.778	19
	2. Macaroni	1. IT	13.360	64	2. Macaroni	1. FR	20.627	59
		2. PT	3.279	16		2. PT	6.165	18

Source: FAO 2005

Trade flows in the cereal sector in the USA

When evaluating US agricultural exports, the EU is no longer the number-one trading partner, but remains a primary market for several products produced in the US. In 2007 the US exported agricultural goods at a value of $89.9 billion, while the EU imported $8.7 billion equaling 9.7% of total US agricultural exports. In the same year, the EU ranked fourth in total agricultural US imports in US dollar values (FRITZ ET AL. 2008).

Cereal exports to the EU represent 13 percent of total US exports to the EU. Note that cereals to the EU are not as dominant as those found within the world market, but it is still a relevant export market for US cereals. The main cereals exported are wheat and grain sorghum, and Spain can be identified as the main destination (see Table 4-7).

Table 4-7: Trade flows in the cereal sector from the USA, 2005

	EXPORT			
	Two most relevant Products	Two most relevant Destinations	Tons	% of total
Farm-level products	Wheat (not durum)	1. ES	257.779	1,07
		2. BE	106.337	0,44
	Grain Sorghum	1. ES	152.524	3,36
		2. FR	696	0,02

Source: Fritz et al. 2008

Trade flows in the cereal sector in Brazil

The estimated grain crop area in Brazil is about 47 million hectares. Regarding the statistical database, the exports to Europe's countries are essential only with respect to maize and wheat, and Portugal and Spain are identified as destinations (see Table 4-8).

Table 4-8: Trade flows in the cereal sector from Brazil, 2005

	EXPORT			
	Two most relevant Products	**Two most relevant Destinations**	**Tons**	**% of total**
Farm-level products	**Maize**	1. ES	66.460	6,21
		2. PT	32.554	3,04
	Wheat	1. ES	56.950	37,21
		2. IT	146	0,1

Source: Fritz et al. 2008

Trade flows in the cereal sector in Turkey

Cereals are the most important part of Turkish plant production in terms of sown land and production volume. Wheat is the main product that is produced and exported the most. The wheat flour, macaroni and pastry industries are well developed in parallel with a wheat production advantage. Germany and Italy are very important destinations for Turkish cereal products. The identification of the appropriate destinations and quantity is provided in Table 4-9.

Table 4-9: Trade flows in the cereal sector from Turkey, 2005

	EXPORT			
	Two most relevant Products	**Two most relevant Destinations**	**Tons**	**% of total**
Farm-level products	Wheat	1. IT	58.380	22,99
		2. PT	25.750	10,14
	Maize	1. CY	5.680	2,24
		2. IT	1.735	0,68
1. Processing-industry level	Wheat Flour	1. CY	6.814	2,68
		2. DE	794	0,31
2. Processing-industry level	Pastry	1. DE	9.495	3,74
		2. BG	4.476	1,76
	Macaroni	1. DE	3.980	1,57
		2. NL	1.044	0,41

Source: FAO 2005

4.3 Trade flows in the meat sector

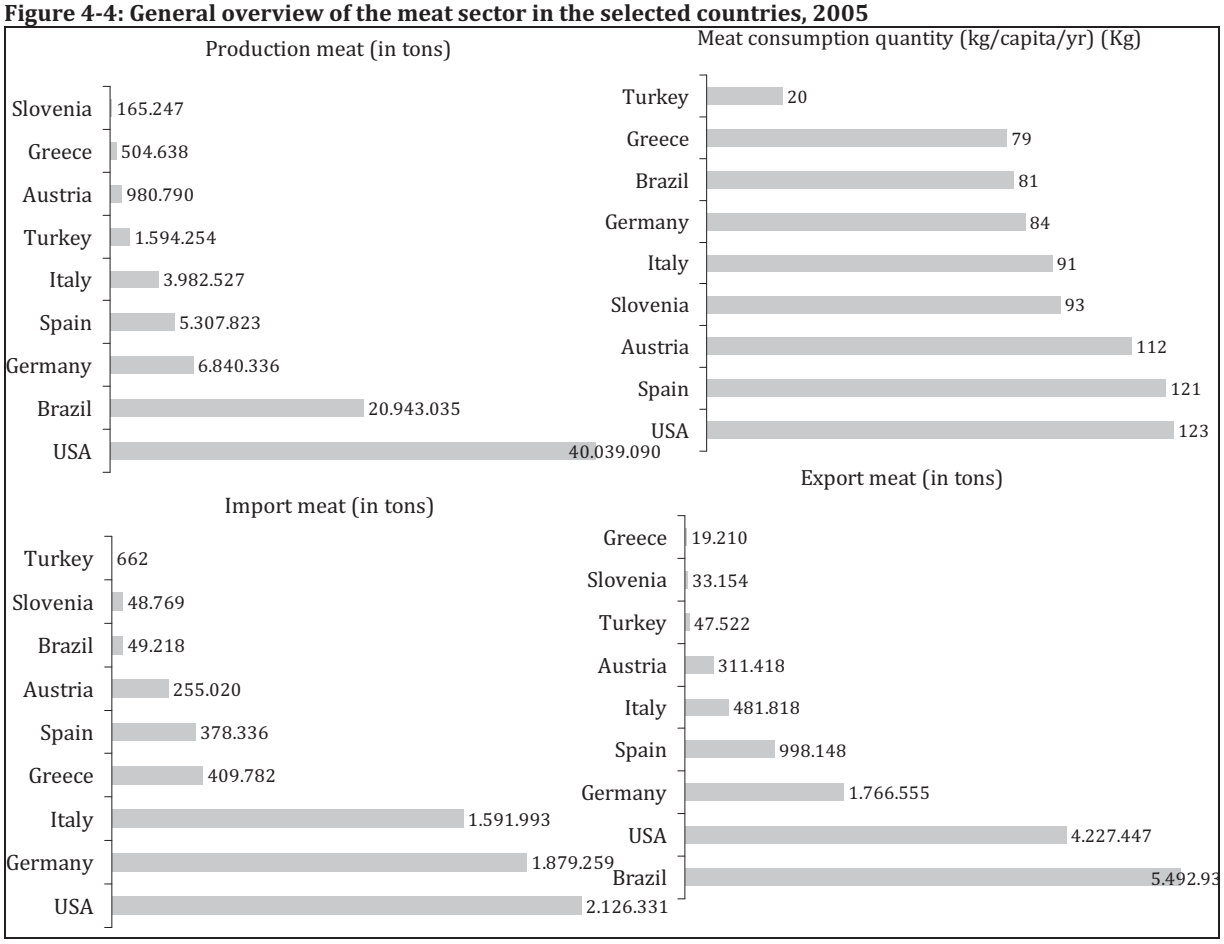
4.3.1 General Overview of the meat sector in the selected countries

The characteristisation of the meat sector follows the same procedure as the cereal sector's characteristisation (comparing the selected countries regarding their production, consumption, import and export of meat products), and the results of the analysis are depicted in Figure 4-4.

Similar to the cereals production, the USA generate the largest quantity of meat products compared to the other eight countries, followed by Brazil and Germany. Spain, Italy and Turkey occupy places four, five and six, respectively. The smallest quantities of meat goods are produced in Austria, Greece and Slovenia. According to meat consumption, Turkey has the lowest quantity, only 20 kg per capita compared to the USA with 123 kg per capita. Spain's population consumes a comparatively high quantity of 121 kg per capita and all other countries have consumption levels between 79 and 112 kg per capita (Greece, Brazil, Germany, Italy, Slovenia, Austria).

In terms of meat import and export, Slovenia, Austria and Germany have similar quantities, and it cannot be determined whether they are net importers or net exporters. Greece and Italy are definitely net importers. Turkey, Spain, USA and Brazil are identified as net exporters.

Figure 4-4: General overview of the meat sector in the selected countries, 2005



Source: Own elaboration based on FAO 2005

4.3.2 Cross-country Analysis of the most relevant trade flows in the meat sector

The general overview of the meat sector in the selected countries has been shown above, and in following an in-depth analysis of meat trade flows will be carried out. The analysis describes the identification of the 2 most important exported and imported products for each tier of the supply chain in each country, and describes the flows for each stage of the chain taking into consideration the origin and the destination of each flow regarding the respective country. First the situation in Germany will be identified, and afterwards the same procedure will be carried out for the other countries identified.

Trade flows in the meat sector in Germany

The **meat** sector is the second largest section in Germany's agri-food imports and exports. The analysis of the meat sector consists of three parts: beef, pork and poultry subsectors. As in the cereal sector, the trade relationships within the meat segment are established on a long-term basis. The most relevant commodities of the meat sector and trade countries for Germany are listed below.

Livestock:

- Imports: cattle, pigs and chicken.

Main origins are: the Netherlands, Denmark and Belgium.

- Exports: cattle, pigs and chicken.

Mostly the exports go to the Netherlands, Italy, Austria and Poland.

Processed meat:

- Imports at the 1st processing-industry level: fresh and frozen beef, pork and poultry.

The Netherlands, France, Belgium, Denmark and Poland are identified for this aspect.

- Exports at the 1st processing-industry level: : fresh and frozen beef, pork and poultry.

The main destinations of the exported processed meat are: Italy, France, the Netherlands and Russia.

- Imports at the 2nd processing-industry level: processed beef, pork and poultry.

The most relevant origins are: Brazil, the Netherlands, Austria and Italy

- Exports at the 2nd processing-industry level: processed beef, pork and poultry.

The exports of the processed meat go mainly to France, the Netherlands, and Great Britain.

The products with their origins and destinations are supported by the appropriate percentage and shown in Table 4-10.

Table 4-10: Trade flows in the meat sector to and from Germany, 2005

	IMPORT			EXPORT		
	Two most relevant Origins	Tons	% of total	Two most relevant Destinations	Tons	% of total
Livestock (beef and veal)	1. NL	3.269	23	1. NL	6.658	44
	2. BE	2.614	19	2. IT	3.045	20
Livestock (pork)	1. NL	231.852	75	1. AT	36.697	77
	2. DK	50.213	16	2. IT	2.707	6
Livestock (poultry)	1. NL	40.138	68	1. NL	181.593	97
	2. DK	10.450	18	2. PL	3.742	2
Fresh (beef and veal)	1. NL	55.194	31	1. IT	95.176	29
	2. FR	27.718	16	2. NL	62.193	19
Frozen (beef and veal)	1. NL	12.200	30	1. RU	17.436	32
	2. BR	4.013	10	2. NL	13.254	24
Fresh (pork)	1. BE	309.022	35	1. IT	259.776	37
	2. DK	269.363	31	2. NL	101.527	14
Frozen (pork)	1. ES	13.362	20	1. RU	47.227	24
	2. DK	12.927	19	2. RO	25.213	13
Fresh and Frozen (poultry)	1. NL	134.283	34	1. NL	63.887	22
	2. PL	68.297	17	2. RU	59.066	20
Processed (canned goods from beef)	1. BR	5.262	27	1. FR	10.719	28
	2. NL	2.590	13	2. NL	6.026	16
Processed (sausage products from pork)	1. AT	13.735	28	1. FR	16.082	14
	2. IT	11.482	24	2. UK	15.936	14
Processed (offal, cans from poultry)	1. BR	93.914	48	1. NL	28.924	23
	2. NL	25.279	13	2. FR	16.477	13

Source: BMELV 2006a, BMELV 2006b and ZMP 2006b

Trade flows in the meat sector in Austria

Meat is the most important agricultural product in Austria, and especially cattle meat is exported mainly to Germany and Italy. Particularly trade with the new EU member states is developing very positively. Due to the fact that there are still a lot of slaughter houses in Austria, companies import a considerable quantity of livestock. A high number of pigs in particular is imported and slaughtered in Austria, and then exported again. As for poultry meat, Austria imports these products on the second processing level. Italy and Germany are main trading partners on both sides – import and export as well. The details of the statistical data are provided in Table 4-11.

Table 4-11: Trade flows in the meat sector to and from Austria, 2005

	IMPORT				EXPORT			
	Two most relevant Products	**Two most relevant Origins**	**Tons**	**% of total**	**Two most relevant Products**	**Two most relevant Destinations**	**Tons**	**% of total**
Farm-level products	**1. Pigs**	1. DE	710.025	99	**1. Cattle**	1. IT	81.261	63
		2. HU	4.160	0,5		2. DE	24.235	19
	2. Cattle	1. CZ	21516	38	**2. Pigs**	1. DE	52.210	51
		2. DE	19613	35		2. SI	22.457	22
1. Processing -industry level	**1. Pigs (complete or half)**	1. DE	36.367	92	**1. Cattle parts**	1. IT	23.825	43
		2. PO	1.160	3		2. DE	9.490	17
	2. Ham (unpro-cessed)	1. DE	11.489	81	**2. Ham (unpro-cessed)**	1. IT	17.083	67
		2. IT	1.684	11		2. CZ	3.895	15
2. Processing -industry level	**1. Chicken meat products**	1. DE	4.140	34	**1. Chicken meat products**	1. DE	9.271	81
		2. SI	1.827	15		2. IT	174	1
	2. Raw sausages	1. DE	6.003	73	**2. Raw sausages**	1. DE	20.742	70
		2. IT	1.622	20		2. IT	886	3

Source: FAO 2005

Trade flows in the meat sector in Italy

Table 4-12 below shows that import and export flows in the meat sector in Italy occur between European partners at each link in the chain. If France and Spain are the most important partners at the production level, Germany is the most relevant business partner at the processing level, both for import and for export.

Table 4-12: Trade flows in the meat sector to and from Italy, 2005

	IMPORT				EXPORT			
	Two most relevant Products	**Two most relevant Origins**	**Tons**	**% of total**	**Two most relevant Products**	**Two most relevant Destinations**	**Tons**	**% of total**
Farm-level products	1. Cattle	1. FR	880.123	65	1. Pigs	1. HU	48985	32
		2. PL	188608	14		2. DE	13989	25
	2. Pigs	1. NL	235.453	41	2. Cattle	1. ES	23.708	53
		2. ES	141.662	25		2. NL	18068	40
1. Processing level	1. Beef meat (fresh & frozen)	1. NL	60.771	22	1. Chicken meat (fresh & frozen)	1. GR	11926	19
		2. DE	58.022	21		2. DE	6629	11
	2. Pork meat (fresh & frozen)	1. DE	61.446	29	2. Pork meat	1. DE	8722	23
		2. FR	60.528	29		2. RO	6829	18
2. Processing level	1. Sausages of Pig Meat	1. DE	9818	78	1. Sausages of Pig Meat	1. DE	9392	27
		2. ES	1520	12		2. ES	3067	9

Source: FAO 2005

Trade flows in the meat sector in Slovenia

Meat production is the most important branch of Slovenian agriculture. Imports are coming mainly from Austria, Italy and Hungary. Exports are mainly driven by big companies themselves or by agents. These countries are very essential trading partners on the export side as well. The in-depth analysis of the statistical data of the most relevant products and their origins and destinations is given in Table 4-13.

Table 4-13: Trade flows in the meat sector to and from Slovenia, 2005

	IMPORT				EXPORT			
	Two most relevant Products	**Two most relevant Origins**	**Tons**	**% of total**	**Two most relevant Products**	**Two most relevant Destinations**	**Tons**	**% of total**
Farm-level products	**1. Cattle**	1. HU	11.102	43	**1. Cattle**	1. AT	4.275	54
		2. CZ	7.920	31		2. IT	2.895	37
	2. Pigs	1. AT	17.357	74	**Pigs**	1. HR	5.780	8
		2. HU	2.977	13		2. HU	1.278	18
1. Processing-industry level	**1. Pig meat**	1. AT	5.356	26	**1. Chicken meat**	1. AT	2.288	31
		2. NL	4.359	21		2. HR	851	12
	2. Chicken meat	1. IT	3.123	73	**2. Beef meat**	1. IT	1.981	83
		2. AT	602	14		2. NL	381	16
2. Processing-industry level	**1. Meat of Chicken Canned**	1. HU	336	8	**1. Sausages of Pig Meat**	1. BA	2.143	25
		2. AT	215	28		2. MK	2.036	24
	2. Sausages of Pig Meat	1. IT	337	43	**2. Meat of Chicken Canned**	1. BA	1.802	22
		2. AT	142	23		2. AT	1.625	2

Source: FAO 2005

Trade flows in the meat sector in Greece

Concerning the meat sector, Greece is an import-dependent country. Table 4-14 shows that pork and beef and also pigs and cattle are primarily imported from the Netherlands, France, Germany, Hungary and Italy. A relevant product volume is distributed through a central meat market, while meat-processing companies are importing directly from suppliers abroad.

Table 4-14: Trade flows in the meat sector to and from Greece, 2005

	IMPORT				EXPORT			
	Two most relevant Products	Two most relevant Origins	Tons	% of total	Two most relevant Products	Two most relevant Destinations	Tons	% of total
Farm-level products	1. Cattle	1. HU	100.900	41	Despite the high production of goat meat in Greece, exports are not relevant due to very high local consumption.			
		2. FR	62.456	25				
	2. Pigs	1. NL	71.047	84				
		2. FR	4.191	0,04				
1. Processing-industry level	1. Pork	1. NL	67.265	43	1. Chicken	1. IT	2.571	35
		2. FR	48.669	32		2. MK	1.453	20
	2. Beef meat	1. FR	56.140	72	2. Pork	1. FR	1.134	58
		2. DE	7.765	1		2. BG	312	16
2. Processing-industry level	1. Sausages of pig meat	1. DE	4.839	64	1. Sausages of pig meat	1. CY	575	59
		2. IT	1.075	14		2. AL	195	20
	2. Meat of Chicken Canned	1. DE	1.888	36	2. Meat of Chicken Canned	1. AL	302	33
		2. IT	1.785	34		2. MK	257	28

Source: FAO 2005

Trade flows in the meat sector in Spain

Pork sector in Spain is a relevant sub sector within the meat sector. The Netherlands is the most active partner in livestock trade with the 73% of the pork livestock sector. More than the imported quantity of pigs is delivered on the export side, and Portugal receives about 71%. Further statistical data of the Spanish trade flows is presented in Table 4-15 below.

Table 4-15: Trade flows in the meat sector to and from Spain, 2005

	IMPORT				EXPORT			
	Two most relevant Products	Two most relevant Origins	Tons	% of total	Two most relevant Products	Two most relevant Destinations	Tons	% of total
Farm-level products	1. Pigs	1. NL	689.698	73	1. Pigs	1. PT	1.036.350	71
		2. DE	129.094	14		2. FR	135.749	9
	2. Cattle	1. FR	259.009	30	2. Cattle	1. IT	59.884	46
		2. PT	229.767	27		2. FR	56.407	43
1. Processing-industry level	1. Chicken meat	1. BR	34.920	43	1. Pig meat	1. FR	63.815	12
		2. UK	11.658	14		2. PT	55.589	19
	2. Pig meat	1. FR	10.215	45	2. Cattle meat	1. FR	35.206	32
		2. DE	2.247	10		2. PT	31.393	32
2. Processing-industry level	1. Meat of Chicken Canned	1. FR	5.565	31	1. Sausages of Pig Meat	1. FR	7.985	29
		2. BR	5.174	29		2. PT	4.380	16
	2. Sausages of Pig Meat	1. DE	6.043	46	2. Meat of Chicken Canned	1. PT	3.725	55
		2. DK	1.919	15		2. FR	1.255	19

Source: FAO 2005

Trade flows in the meat sector in USA

U.S. exports of meat to the EU are nearly non-existent. This is a direct result of the trade restrictions mentioned earlier due to disease outbreaks and production practices. This statement can be confirmed by the statistical data which is given in Table 4-16.

Table 4-16: Trade flows in the meat sector from USA, 2005

	EXPORT			
	Two most relevant Products	**Two most relevant Destinations**	**Tons**	**% of total**
Meat	**Chicken**	1. RO	90.193	3,87
		2. LT	78.495	3,37
	Pork	1. RO	25.294	3,1
		2. UK	2.872	0,35

Source: Fritz et al. 2008

Trade flows in the meat sector in Brazil

The meat sector is the second largest complex in Brazilian agri-business exports, gaining more importance over the last few years. Brazil has the world's largest commercial cattle herds, which are mainly raised in pastures. The main destinations of cattle exports to Europe are Great Britain and Italy. While cattle and chicken are essential as fresh-meat exports, pork and chicken are the most relevant products as processed meat and go to the Netherlands and Great Britain, and to France and Germany, respectively (see Table 4-17).

Table 4-17: Trade flows in the meat sector from Brazil, 2005

	EXPORT		
	Two most relevant Products	**Two most relevant Destinations**	**% of total**
Fresh	Cattle	1. UK	4
		2. IT	3
	Chickens	1. NL	4
		2. DE	2
Processed	Chicken meat	1. NL	0.3
		2. UK	0.3
	Pork	1. FR	1.5
		2. DE	1.4

Source: Fritz et al. 2008

Trade flows in the meat sector in Turkey

The red-meat sector is not as developed in terms of foreign trade. In spite of a high number of livestock and slaughter quantities, high domestic consumption and an import-export ban restrain development of foreign trade. Unlike the red-meat sector, poultry is well developed in

all stages of production. Export activities are generally limited by poultry. While chickens are exported to Romania and Bulgaria, chicken meat is exported to Bulgaria and Cyprus (see Table 4-18).

Table 4-18: Trade flows in the meat sector from Turkey, 2005

	EXPORT			
	Two most relevant Products	**Two most relevant Destinations**	**Tons**	**% of total**
Farm-level products	Chickens	1. RO	3.378	65.3
		2. BG	568	10.98
1. Processing-industry level	Chicken meat	1. BG	1.473	28.47
		2. CY	630	12.18

Source: Fritz et al. 2008

4.4 Trade flows in the fruit and vegetable sector

4.4.1 General Overview of the fruit sector in the selected countries

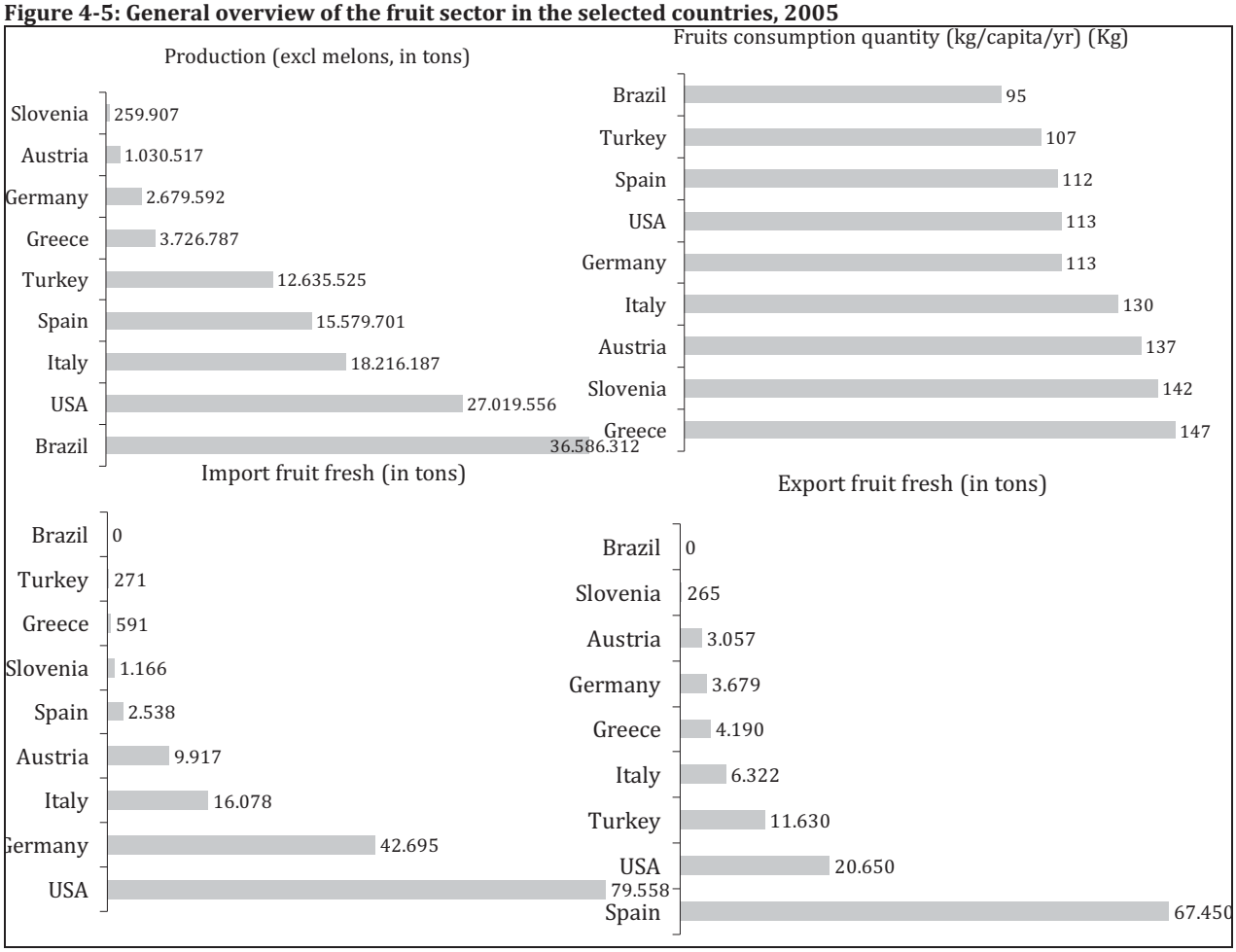
In order to estimate the current situation of the fruit sector in the selected countries, a similar procedure as to the sectors described above (cereal and meat sectors) is applied.

The fruit supply chains are analysed by describing in-depth production, consumption, and trading issues with a particular interest on import and export data in the selected six European (Germany, Austria, Italy, Slovenia, Greece and Spain) and three non-European (USA, Brazil and Turkey) countries.

This analysis is presented in Figure 4-5 below. Brazil produces the largest quantity of fruit compared to the other eight countries, followed by USA, Italy, Spain and Turkey. In terms of fruit consumption, Greece and Slovenia have the largest quantities of 147 kg and 142 kg per capita, respectively. With respect to the import and export quantities of fruit, it cannot be stated whether or not the countries are more or less net importers or net exporters.

The major importers of fruit are the USA and Germany. Spain can be identified as the biggest net exporter. Statistical data on fruit imports and exports of Brazil are not given in FAO and therefore are given the number zero.

Figure 4-5: General overview of the fruit sector in the selected countries, 2005



Source: Own elaboration based on FAO 2005

4.4.2 Cross-country analysis of the most relevant trade flows in the fruit sector

Similar to the procedure of the agri-food sectors above, an identification of the most essential trade flows in the fruit sector will be done below.

Trade flows in the fruit sector in Germany

According to foreign trade within the **fruit** sector, Germany is an importing country: The expert interviews with fruit and vegetable enterprises revealed that transactions are executed mostly with well-known cross-border partners. In addition, they apply contracts which vary from short term to long term. The most relevant commodities of the fruit/vegetables sectors and trade countries for Germany are listed below (see Table 4-19).

Fresh fruit:

- Imports: bananas and apples.

  Bananas come from Ecuador and Colombia and apples from Italy and the Netherlands.

- Exports: bananas and apples.

  The bananas are identified as the most exported fresh fruit and in this case are concerned primarily with re-exports. The exported apples go to the Netherlands and Denmark.

Processed fruit/vegetables:

- Imports: orange and apple concentrate.

Brazil, Switzerland, Poland and China are identified for the section.

- Exports: orange and apple juice.

The Netherlands, France and Great Britain are the most relevant destinations of the above mentioned exported commodities.

Table 4-19: Trade flows in the fruit sector to and from Germany, 2005

	IMPORT				EXPORT			
	Two most relevant Products	**Two most relevant Origins**	**Tons**	**% of total**	**Two most relevant Products**	**Two most relevant Destinations**	**Tons**	**% of total**
Fresh Fruit	1. Bananas	1. EC	447.230	38	1. Bananas (re-exports)	1. AT	50.895	19
		2. CO	302.369	25		2. SE	44.097	17
	2. Apples	1. IT	327.878	39	2. Apples	1. NL	14.954	16
		2. NL	117.761	14		2. DK	11.285	12
Processed Fruit	1. Orange concentrate	1. BR	305.539	65	1. Orange juice	1. FR	140.873	34
		2. CH	63.226	13		2. NL	82.216	20
	2. Apple concentrate	1. PL	113.443	38	2. Apple juice	1. UK	50.392	19
		2. CN	70.054	24		2. NL	42.094	17

Source: JANORSCHKE 2007, ZMP 2005, BLE 2006, FAOSTAT 2007, VdF 2007

Trade flows in in the fruit sector in Austria

Compared to the meat and cereals sectors, fruit and vegetables are of lesser importance in Austria when compared with production. Within the fruit sector, imports from Germany, China, Italy and Belgium are of importance. The most essential export partner in the fruit sector aside from Germany (for apples and grapes) is Italy (orange juice). Table 4-20 shows the percentage spread of the trade flows and the appropriate trade partners.

Table 4-20: Trade flows in the fruit sector to and from Austria, 2005

	IMPORT				EXPORT			
	Two most relevant Products	**Two most relevant Origins**	**Tons**	**% of total**	**Two most relevant Products**	**Two most relevant Destinations**	**Tons**	**% of total**
Fresh Fruit	1. Bananas	1. DE	68.492	67	**1. Apples**	1. DE	37.222	52
		2. BE	19.541	19		2. HR	5.699	8
	2. Apples	1. IT	40.616	40	**2. Grapes**	1. DE	22.068	75
		2. HU	28.559	28		2. NL	5.163	16
Processed Fruit	1. Apple juice, single strength	1. CH	26.477	21	1. Orange juice, single strength	1. IT	12.388	25
		2. DE	25.896	20		2. DE	11.498	23
	2. Orange juice, single strength	1. CH	25.738	36	2. Apple juice, single strength	1. DE	22.276	50
		2. DE	20.548	29		2. JP	6.768	15

Source: FAO 2005

Trade flows in the fruit sector in Italy

For the Italian fruit supply chain, the analysis shows that exchanges take place with extra-EU partners in the case of fresh products (e.g., bananas and peaches). The processed-fruit products come mainly from EU countries like Germany, Austria, Spain and Greece. Italy exports mainly

apples, grapes and processed fruit to EU countries like Spain, Great Britain, Germany and France. The appropriate percentage depiction is given in Table 4-21.

Table 4-21: Trade flows in the fruit sector to and from Italy, 2005

	IMPORT				EXPORT			
	Two most relevant Products	**Two most relevant Origins**	**Tons**	**% of total**	**Two most relevant Products**	**Two most relevant Destinations**	**Tons**	**% of total**
Fresh Fruit	1. Bananas	1. EC	276002	49	1. Apples	1. ES	52406	7
		2. CO	74855	13		2. UK	43098	6
	2. Peaches	1. ES	47639	80	2. Grapes	1. DE	154978	31
		2. FR	8050	14		2. FR	80807	16
Processed Fruit	1. Fruit juice	1. AT	13880	27	1. Fruit juice	1. DE	22459	27
		2. DE	12296	24		2. FR	12315	15
	2. Dried fruit	1. ES	851	35	2. Prepared fruit	1. DE	4353	26
		2. GR	415	17		2. FR	3904	24

Source: FAO 2005

Trade flows in the fruit sector in Slovenia

Fruit is mainly imported to Slovenia from Ecuador and Colombia (bananas) and Italy and Egypt (oranges). Apples are one of the most important fruits in Slovenian production and trade. The most important trading partners are Croatia and Austria. Regarding the exports of bananas, these are mainly re-exported and go to Italy. The quantity of exported processed fruit is not relevant and therefore not under consideration (see Table 4-22).

Table 4-22: Trade flows in the fruit sector to and from Slovenia, 2005

	IMPORT				EXPORT			
	Two most relevant Products	**Two most relevant Origins**	**Tons**	**% of total**	**Two most relevant Products**	**Two most relevant Destinations**	**Tons**	**% of total**
Fresh Fruit	1. Bananas	1. EC	22.894	45	1. Apples	1. HR	8.277	32
		2. CO	19.296	38		2. AT	7.078	27
	2. Oranges	1. IT	4.651	23	2. Bananas	1. IT	15.243	83
		2. EG	3.004	15		2. HU	1.415	8
Processed Fruit	1. Fruit Prp Nes	1. ES	1.891	16	not relevant export			
		2. IT	1.745	15				
	2. Orange juice, single strength	1. BE	1.568	34				
		2. DE	1.004	22				

Source: FAO 2005

Trade flows in the fruit sector in Greece

Greece is export-oriented regarding fruit products. In particular, major Greek exports include grapes and oranges for destinations such as Germany, the UK and Romania. On the other hand, imports are mainly bananas and lemons from Ecuador, Argentina, Turkey and Italy. The results of the statistical database are presented in Table 4-23.

Table 4-23: Trade flows in the fruit sector to and from Greece, 2005

	IMPORT				EXPORT			
	Two most relevant Products	Two most relevant Origins	Tons	% of total	Two most relevant Products	Two most relevant Destinations	Tons	% of total
Fresh Fruit	1. Bananas	1. EC	40.747	49	1. Grapes	1. DE	33.522	37
		2. IT	37.598	45		2. UK	21.854	24
	2. Lemons & Limes	1. AR	27.351	44	2. Oranges	1. RO	38.146	18
		2. TR	25.807	41		2. DE	31.521	15
Processed Fruit	1. Orange juice (single strength)	1. DE	6.008	30	1. Grape juice	1. IT	12.027	98
		2. BE	4.621	23		2. TR	208	2
	2. Apple juice (concentrated)	1. DE	7.467	93	2. Orange juice (single strength)	1. UK	665	15
		2. IT	556	7		2. MK	590	14

Source: FAO 2005

Trade flows in the fruit sector in Spain

The fruit sector represents a major sector in Spain. The main fresh-fruit exports are oranges and apples that go to Germany, France and Portugal. The processed-fruit sector shows that mostly orange and grape juice are exported to France and Germany, and Italy and France. The Spanish results of the trade flows regarding the fruit sector are shown in Table 4-24.

Table 4-24: Trade flows in the fruit sector to and from Spain, 2005

	IMPORT				EXPORT			
	Two most relevant Products	Two most relevant Origins	Tons	% of total	Two most relevant Products	Two most relevant Destinations	Tons	% of total
Fresh Fruit	1. Apples	1. FR	73.817	33	1. Oranges	1. DE	308.333	28
		2. IT	37.395	17		2. FR	290.419	26
	2. Pears	1. BE	18.256	34	2. Apples	1. FR	26.185	29
		2. NL	8.644	16		2. PT	24.650	27
Processed Fruit	1. Orange juice, single strength	1. BE	22.247	21	1. Orange juice, single strength	1. FR	106.656	72
		2. NL	15.118	21		2. DE	22.825	15
	2. Orange juice, concentrated	1. NL	4.088	39	2. Grape juice	1. IT	31.623	27
		2. FR	2.543	24		2. FR	13.440	12

Source: FAO 2005

Trade flows in the fruit sector in USA

The top two fresh-fruit products being exported into the EU are grapefruit and apples. Within the processed-fruit sector the top products are prunes and raisins. The quantities of these exported fruit products are shown in Table 4-25.

Table 4-25: Trade flows in the fruit sector from USA, 2005

	EXPORT			
	Two most relevant Products	**Two most relevant Destinations**	**Tons**	**% of total**
Fresh	**Apples**	1. UK	34.274	5.08
		2. FI	1.968	0.29
	Grapefruit	1. NL	15.399	702
		2. FR	20.266	9.24
Processed	**Plums, dried**	1. DE	5.376	11.78
		2. IT	3.473	7.61
	Fruit, dried	1. UK	1.743	7.52
		2. DE	540	2.33

Source: Fritz et al. 2008

Trade flows in the fruit sector in Brazil

Although Brazil is the third largest fruit producer in the world, its export volume is not as important as the grain or meat sector to the Brazilian export balance, with the exception of orange juice. Fresh-fruit exports represent only 1% of the total (FRITZ ET AL. 2008). Bananas and mangos are exported the most, to Great Britain and Italy, respectively, and also to the Netherlands and the USA. The exports of orange juice in concentrated and non-concentrated form are identified as processed-fruit products. The largest amounts go to Belgium and the Netherlands (see Table 4-26).

Table 4-26: Trade flows in the fruit sector from Brazil, 2005

	EXPORT		
	Two most relevant Products	**Two most relevant Destinations**	**% of total**
Fresh fruit	Banana	1. UK	28
		2. IT	9
	Mango	1. NL	50
		2. USA	23
Processed fruit	Orange juice (concentrated)	1. BE	50
		2. NL	4
	Orange juice (non-concentrated)	1. NL	44
		2. BE	31

Source: Fritz et al. 2008

Trade flows in the fruit sector in Turkey

Fruit and vegetables are one of the most advantageous agricultural sub-sectors of Turkey in terms of production and foreign trade. Lemons and fruit juice are the most exported products. The main importers of these two products are Greece and Romania as well as Germany and Cyprus, respectively. The identified quantities are provided in Table 4-27.

Table 4-27: Trade flows in the fruit sector from Turkey, 2005

	EXPORT			
	Two most relevant Products	**Two most relevant Destinations**	**Tons**	**% of total**
Fresh Fruit	Lemons	1. GR	25.503	8.64
		2. RO	22.688	.69
Processed Fruit	Fruit juice	1. DE	5.463	1.85
		2. CY	1.736	0.59

Source: Fritz et al. 2008

4.4.3 General Overview of the vegetable sector in the selected countries

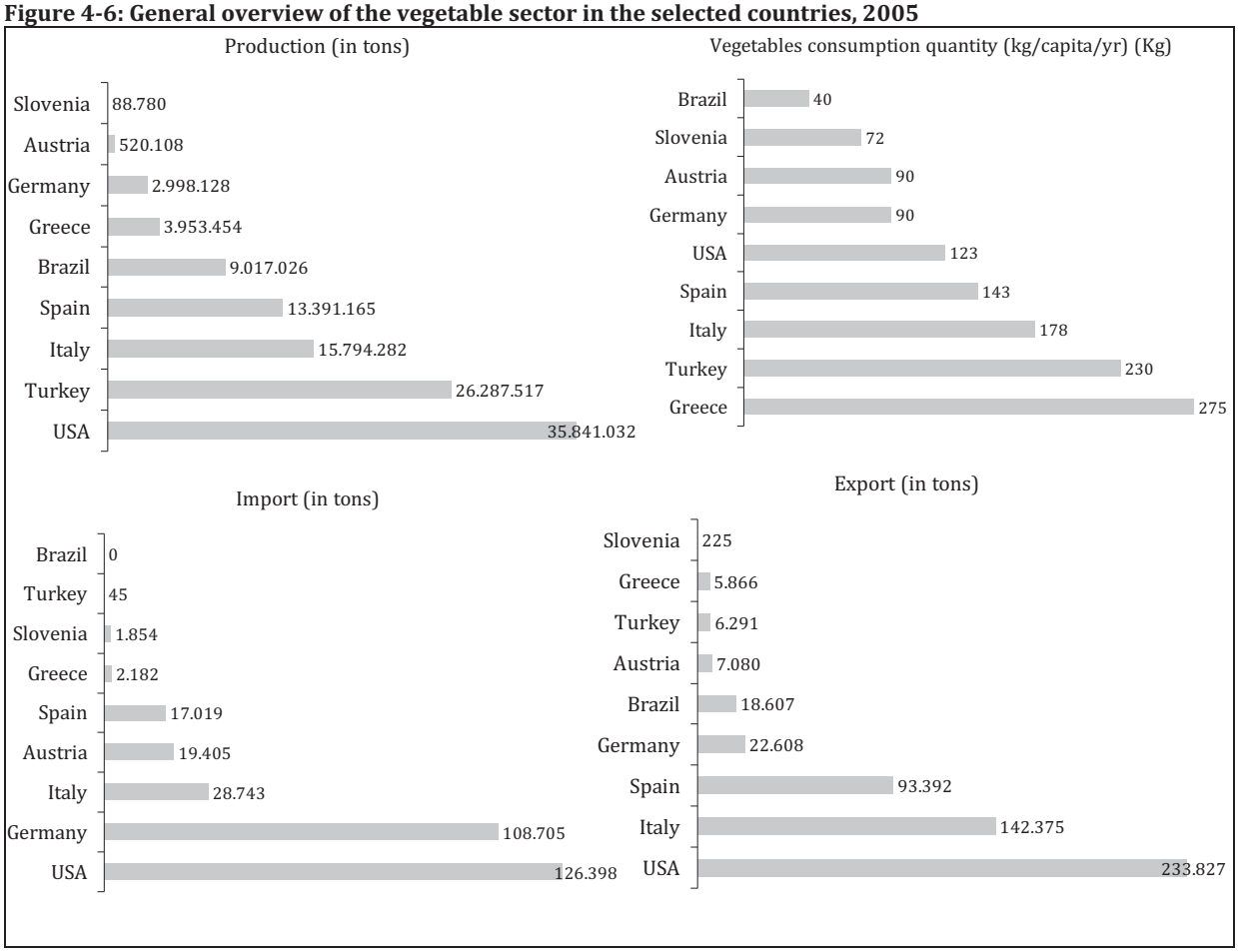
The characteristisation of the vegetable sector follows the same procedure as the other sectors (comparing the selected countries regarding their production, consumption, import and export of meat products). Figure 4-6 provides the results of the vegetable-sector analysis.

Similar to all other agri-food production, the USA has the largest quantity of vegetable products compared to the other eight countries. Due to their geographical conditions, Turkey, Italy and Spain have a huge production of vegetables as well. Slovenia produces the smallest quantity of vegetables.

Concerning the consumption of vegetables, Turkey and Greece have quantities of more than 200 kg per capita; the USA, Italy and Spain have more than 120 kg per capita and the rest of the countries (Brazil, Slovenia, Austria and Germany) less than 100 kg per capita.

In terms of the import and export regarding vegetables, the USA is the largest importer and exporter. Germany, Austria and Slovenia are identified as net importers and the net exporters are Greece, Turkey, Spain and Italy.

Figure 4-6: General overview of the vegetable sector in the selected countries, 2005



Source: Own elaboration based on FAO 2005

4.4.4 Cross-country analysis of the most relevant trade flows in the vegetable sector

Trade flows in the vegetable sector in Germany

Concerning foreign trade within the **vegetable** sector, Germany is an importing country: The expert interviews with fruit and vegetable enterprises revealed that transactions are executed mostly with well-known cross-border partners. In addition, they employ contracts which vary from short term to long term. The most relevant commodities of the fruit/vegetable sectors and trade countries for Germany are listed below (seeTable 4-28).

Fresh vegetables:

- Imports: tomatoes and cucumbers.

  Together with Spain, the Netherlands delivers tomatoes and cucumbers into Germany.

- Exports: white and red cabbage, and onion.

  Sweden and the Czech Republic receive white and red cabbage from Germany and the Netherlands and Austria as well as onions.

Processed vegetables:

- Imports: tomato purée and tomatoes (prepared without vinegar).

  Italy is the most essential trade partner for processed vegetables and distributes more than 70 percent. The second important country for the imported processed vegetables into Germany is Spain.

- Exports: pasteurised cucumbers and dried peas.

Both commodities go to the Netherlands, and Denmark is in the second place regarding dried peas. France is the second destination of pasteurised cucumbers.

Table 4-28: Trade flows in the vegetable sector to and from Germany, 2005

	IMPORT				EXPORT			
	Two most relevant Products	**Two most relevant Origins**	**Tons**	**% of total**	**Two most relevant Products**	**Two most relevant Destinations**	**Tons**	**% of total**
Fresh Vegetables	1. Tomatoes	1. NL	319.341	47	1. White and red cabbage	1. SE	17.408	30
		2. ES	198.784	29		2. CZ	7.348	13
	2. Cucumbers	1. NL	248.644	56	2. Onions	1. NL	10.669	22
		2. ES	145.104	33		2. AT	6.917	14
Processed Vegetables	1. Tomato purée	1. IT	150.960	70	1. Pasteurised cucumbers	1. NL	12.869	19
		2. ES	45.763	21		2. FR	6.759	10
	2. Processed tomatoes	1. IT	177.144	92	2. Dried peas	1. NL	61.458	80
		2. ES	3.275	2		2. DK	3.890	5

Source: ZMP 2005, ZMP 2007b, BLE 2006, FAOSTAT 2007, FREITAG 2006

Trade flows in the vegetable sector in Austria

Table 4-29 highlights the Austrian results of the most relevant imported and exported vegetable products. On the imported side, the main origins are Italy, Spain, the Netherlands and Germany. On the exported side, Germany, Hungary and the Czech Republic are of big importance.

Table 4-29: Trade flows in the vegetable sector to and from Austria, 2005

	IMPORT				EXPORT			
	Two most relevant Products	**Two most relevant Origins**	**Tons**	**% of total**	**Two most relevant Products**	**Two most relevant Destinations**	**Tons**	**% of total**
Fresh vegetables	1. Tomatoes	1. IT	20.097	42	**1. Onions**	1. DE	6.352	16
		2. ES	16.850	36		2. HU	4.701	12
	2. Cucumbers	1. ES	8.669	42	**2. Carrots**	1. DE	9.235	48
		2. NL	2.862	14		2. CZ	1.972	10
Processed Vegetables	1. Vegetables in Vinegar	1. DE	10.163	60	not relevant			
		2. TR	1.260	7				
	2. Paste of Tomatoes	1. IT	7.405	55				
		2. CN	2.159	16				

Source: FAO 2005

Trade flows in the vegetable sector in Italy

The Italian vegetable supply chain shows a similar scenario, with few EU countries as main trade partners: France, Spain and the Netherlands are the countries of origin of the most imported products (potatoes, tomatoes and processed vegetables), and the UK and Germany are the destinations of the most exported products at each level of the supply chain (lettuce, tomatoes and processed vegetables). Further trading export partners of Italy are the extra-EU countries like China and Australia (see Table 4-30).

Table 4-30: Trade flows in the vegetable sector to and from Italy, 2005

	IMPORT				EXPORT			
	Two most relevant Products	**Two most relevant Origins**	**Tons**	**% of total**	**Two most relevant Products**	**Two most relevant Destinations**	**Tons**	**% of total**
Fresh Vegetables	1. Potatoes	1. FR	266.281	47	1. Lettuces, chicories	1. DE	43.897	45
		2. NL	80.066	14		2. CH	8.200	8
	2. Tomatoes	1. NL	34.714	35	2. Tomatoes	1. DE	43.871	48
		2. ES	34.213	34		2. AT	11.306	12
Processed Vegetables	1. Vegetable Frozen	1. BE	53.164	34	1. Tomatoes preserves and peeled	1. UK	193.659	23
		2. FR	22.837	15		2. DE	135.643	16
	2. Vegetables Preserved	1. FR	33.607	49	2. Veg. and legumes prepared or conserved	1. DE	34.049	38
		2. ES	10.206	15		2. AU	9.144	10

Source: FAO 2005

Trade flows in the vegetable sector in Slovenia

In the vegetable sector the most important trading partners on the import side are Italy, Turkey, Austria and Netherlands. Most vegetables from Slovenia are exported to Germany. A detailed analysis of the quantity and the countries is given in Table 4-31.

Table 4-31: Trade flows in the vegetable sector to and from Slovenia, 2005

	IMPORT				EXPORT			
	Two most relevant Products	**Two most relevant Origins**	**Tons**	**% of total**	**Two most relevant Products**	**Two most relevant Destinations**	**Tons**	**% of total**
Fresh Vegetables	1. Potatoes	1. IL	5.406	22	1. Potatoes	1. DE	11.787	84
		2. NL	4.126	17		2. HR	858	6
	2. Tomatoes	1. IT	5.302	37	2. Tomatoes	1. DE	241	35
		2. TR	4.931	35		2. IT	141	20
Processed Vegetables	1. Onions, dry	1. AT	4.205	35	1. Onions, dry	1. ES	1.171	68
		2. NL	3.378	28		2. HU	206	12
	2. Vegetables preserved Nes	1. IT	5.011	61	2. Vegetables preserved Nes	1. RS	432	31
		2. AT	619	7		2. DE	318	23

Source: FAO 2005

Trade flows in the vegetable sector in Greece

For vegetables, overall Greece is exporting more than importing. In particular, major Greek exports include asparagus and cucumbers to destinations such as Germany, Austria and the USA (see Table 4-32).

Table 4-32: Trade flows in the vegetable sector to and from Greece, 2005

	IMPORT				EXPORT			
	Two most relevant Products	**Two most relevant Origins**	**Tons**	**% of total**	**Two most relevant Products**	**Two most relevant Destinations**	**Tons**	**% of total**
Fresh Vegetables	1. Potatoes	1. EG	49.527	43	1. Cucumbers and gherkins	1. DE	9.235	64
		2. FR	20.949	18		2. AT	1.663	11
	2. Tomatoes	1. TR	5.267	33	2. Asparagus	1. DE	7.914	81
		2. MK	4.473	28		2. AT	976	10
Processed Vegetables	1. Vegetables Frozen	1. BE	7.615	31	1. Vegetables in Vinegar	1. USA	10.611	73
		2. BG	3.384	14		2. DE	1.201	8
	2. Vegetables Preserved Nes	1. TR	3.554	25	2. Vegetables Preserved Nes	1. DE	4.294	36
		2. CY	2.127	15		2. SE	1.012	8

Source: FAO 2005

Trade flows in the vegetable sector in Spain

Spain is an export-oriented country like Greece regarding vegetable products. The main Spanish fresh vegetables are exported to Germany and the UK (tomatoes and lettuce). In addition to the export side, the quantities of vegetables imported to Spain are shown in Table 4-33.

Table 4-33: Trade flows in the vegetable sector to and from Spain, 2005

	IMPORT				EXPORT			
	Two most relevant Products	**Two most relevant Origins**	**Tons**	**% of total**	**Two most relevant Products**	**Two most relevant Destinations**	**Tons**	**% of total**
Fresh Vegetables	1. Potatoes	1. FR	507.851	68	1. Tomatoes	1. DE	198.893	22
		2. UK	79.373	11		2. UK	183.845	20
	2. Tomatoes	1. PT	41.287	57	2. Lettuce and chicory	1. DE	155.531	29
		2. MA	13.840	19		2. UK	131.074	24
Processed Vegetables	1. Vegetables Preserved	1. CN	45.201	23	1. Vegetable Frozen	1. FR	51.744	27
		2. PE	39.741	18		2. DE	33.599	18
	2. Vegetable Frozen	1. BE	31.208	37	2. Vegetables Preserved	1. FR	40.420	30
		2. FR	24.643	29		2. USA	38.503	29

Source: FAO 2005

Trade flows in the vegetable sector in the USA

Potatoes are identified as the most exported vegetable for Europe. In particular, Great Britain and the Netherlands are identified as the most essential destinations and the respective quantities are presented in Table 4-34.

Table 4-34: Trade flows in the vegetable sector from USA, 2005

	EXPORT			
	Two most relevant Products	**Two most relevant Destinations**	**Tons**	**% of total**
Fresh	**Potatoes**	1. UK	7.446	2.58
		2. NL	5	0

Source: Fritz et al. 2008

Trade flows in the vegetable sector in Turkey

As mentioned in the section on the fruit sector, Turkey has an important role in the production and foreign trade of fruit and vegetables. The most exported vegetables are shown as follows (see Table 4-35). Tomatoes are the most exported fresh vegetable. Their main importers are Romania and Germany. Frozen vegetables and peeled tomatoes are identified as processed vegetables in the statistical database. Frozen vegetables are mainly exported to Germany and Belgium. Peeled tomatoes are mainly exported to Germany as well as Ireland.

Table 4-35: Trade flows in the vegetable sector from Turkey, 2005

	EXPORT			
	Two most relevant Products	**Two most relevant Destinations**	**Tons**	**% of total**
Fresh Vegetables	Tomatoes	1. RO	28.070	11.59
		2. DE	7.002	2.89
Processed Vegetables	Frozen vegetables	1. DE	12.431	5.13
		2. BE	10.676	4.41
	Tomato peeled	1. DE	1.036	0.43
		2. IE	830	0.34

Source: Fritz et al. 2008

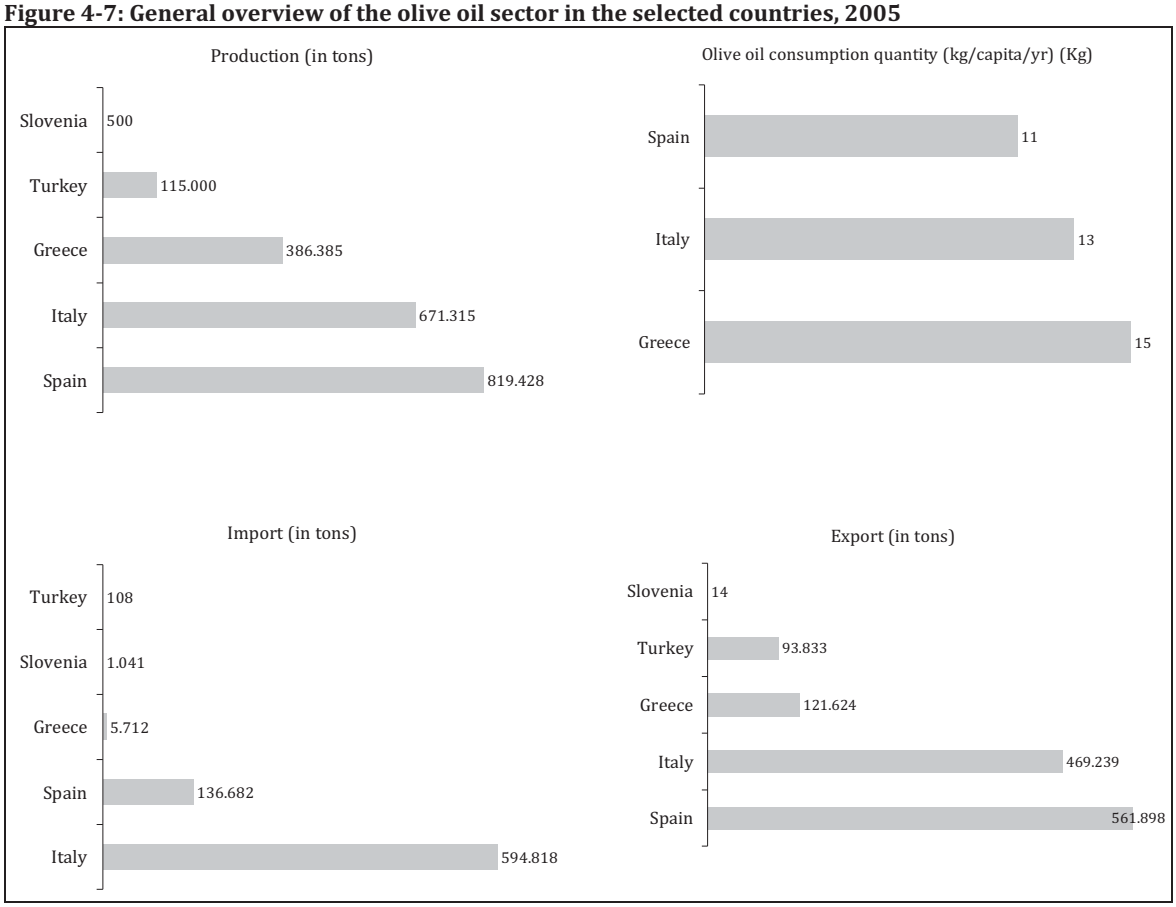
4.5 Trade flows in the olive oil sector

4.5.1 General overview of the olive oil sector in the selected countries

In the analysis of the olive oil sector only five countries are included due to the specifity of this product, which is dependent on appropriate climate conditions. Spain is in first place regarding production, followed by Italy, Greece and Turkey. The data for consumption shows similar results for the three listed countries Greece, Italy and Spain.

In terms of imports and exports, Italy is the major importer, and Spain the main exporter. Greece and Turkey export more than they import. The quantities of the mentioned results are presented in Figure 4-7.

Figure 4-7: General overview of the olive oil sector in the selected countries, 2005



Source: Own elaboration based on FAO 2005

4.5.2 Cross-country analysis of the most relevant trade flows in the olive oil sector

Trade flows in the olive oil sector in Italy

The trade flows concerning the olive oil supply chain show that Italy is a net importer of olive oil. Olives and high-quality olive oil are imported mainly from mediterranean countries (Spain, Greece), while export (both at production and at processing level) involves not only EU countries like Germany and France but also extra-EU partners (the USA are an important destination for Italian olive oil supply chain products). The percentages and quantities of the Italian exports and imports are shown in Table 4-36 below.

Table 4-36: Trade flows in olive oil sector to and from Italy, 2005

	IMPORT			EXPORT		
	Two most relevant Origins	Tons	% of total	Two most relevant Destinations	Tons	% of total
Olives	1. GR	2.412	60	1. FR	228	29
	2. ES	1.238	31	2. DE	152	20
Virgin olive oil	1. ES	216.795	38	1. USA	190.795	44
	2. GR	92.013	16	2. DE	47.008	11

Source: FAO 2005

Trade flows in the olive oil sector in Slovenia

Slovenia is a net importer of olive oil. More than half of all olive oil is imported, mainly from the EU (Italy, Greece and Spain). Slovenia exports mainly to Croatia and Bosnia-Herzegovina (see Table 4-37).

Table 4-37: Trade flows in the olive oil sector to and from Slovenia, 2005

	IMPORT			EXPORT		
	Two most relevant Origins	**Tons**	**% of total**	**Two most relevant Destinations**	**Tons**	**% of total**
Olives preserved	1. IT	289	44	1. RS + ME	26	30
	2. GR	136	21	2. HR	24	28
Olive oil	1. ES	556	54	1. BA	4	33
	2. IT	354	34	2. HR	3	25

Source: FAO 2005

Trade flows in the olive oil sector in Greece

In the olive oil sector Greece is clearly an exporting country. Most exports are to Italy but also to Germany and Spain as EU countries, and outside the EU to the USA (see Table 4-38).

Table 4-38: Trade flows in the olive oil sector to and from Greece, 2005

	IMPORT					
	Two most relevant Origins	**Tons**	**% of total**	**Two most relevant Destinations**	**Tons**	**% of total**
Olives	1. IT	446	89	1. IT	3.683	59
	2. BE	29	6	2. DE	618	10
Olives (preserved)	1. EG	1.092	27	1. USA	17.277	24
	2. DE	857	22	2. IT	13.143	18
Olive oil	1. IT	2.213	59	1. IT	79.012	80
	2. ES	1.061	28	2. ES	3.999	4

Source: FAO 2005

Trade flows in the olive oil sector in Spain

Olive trees and the olive oil sector in Spain are a part of Spanish culture. The most dominant import partners are also olive oil producers (Portugal and Italy), and the exports of canned or bottled olive oil go to France and Portugal. Table 4-39 highlights the results of the Spanish quantities and percentages in the olive oil sector.

Table 4-39: Trade flows in the olive oil sector to and from Spain, 2005

	IMPORT			EXPORT		
	Two most relevant Origins	**Tons**	**% of total**	**Two most relevant Destinations**	**Tons**	**% of total**
Olives	1. PT	583	76	1. DE	3.386	60
	2. FR	92	12	2. IT	582	10
Olive oil	1. IT	17.526	26	1. FR	53.712	17
	2. MA	11.727	17	2. PT	34.599	11

Source: FAO 2005

Trade flows in the olive oil sector in Turkey

Turkey is one of the most important olive-oil-producing countries in the world. However, export is generally limited to Italy and Spain in bulk packages mainly due to high import tax rates in European Countries (see Table 4-40).

Table 4-40: Trade flows in the olive oil sector from Turkey, 2005

	EXPORT		
	Two most relevant Destinations	**Tons**	**% of total**
Olive oil	1. IT	40.609	73.6
	2. ES	20.039	36.31

Source: FAO 2005

4.6 Summary

In this chapter, the international trade flows in different agri-food sectors are identified. This analysis will be used as a basis for future research, in consideration of the specific role of trust in international transactions. These agri-food trade flows are identified, referring to the volume of exchanged goods, as an important potential on which to focus attention and study for the introduction of electronic commerce.

In this identification process the focus was mainly on four agri-food supply chains: cereals, meat, fruit and vegetables, and olive oil. Additionally, an investigation of all tiers of the supply chain – production, consumption and import/export – was carried out.

With respect to the statistical database, the trade flows are identified for each of the agri-food sectors mentioned above and regarding the following criteria:

- the two most relevant products for export at every level of the agri-food chain with the two most relevant destination countries;
- the two most relevant products for import at every level of the agri-food chain with the two most relevant countries of origin.

The procedure has been applied to six European traders in agricultural products (Germany, Austria, Italy, Slovenia, Greece and Spain) and three non-European countries (USA, Brazil and Turkey).

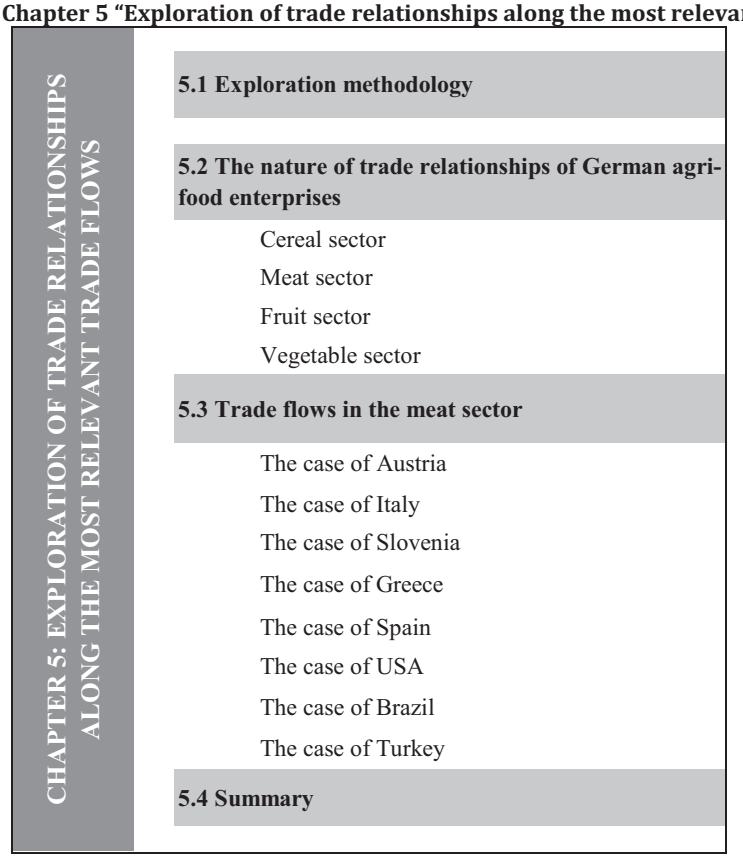
The trade structures in the selected countries are diverse, and there is a complex picture. Wheat and maize are major primary cereal commodities which are imported as well as exported. Most imports and exports of meat are of cattle, pigs or chickens. Overlapping trade flows could be identified between some countries, such as Germany, Austria, Italy and Spain.

5 EXPLORATION OF TRADE RELATIONSHIPS ALONG THE MOST RELEVANT TRADE FLOWS

The previous Chapter 4 presented the major international trade flows. To complete the picture of the trade flows, it is important to proceed with the analysis of the nature of trade relationships within the identified cross-border transactions.

In this chapter, first the methodology of the current exploration regarding the nature of the trade relationships along the most relevant trade flows is explained. This elaboration is essential to understand if the international exchange is based more on long-term relationships, with pre-existing trust, or more spot market, where the traders do not know each other before and no trust has been established. Hence, the character of trade relationships and contracting of the German enterprises involved with external trade is presented in-depth, based mainly on the findings gained from the expert interviews. Third, the situation of the type of relationship and contracting in selected European and cross-border agri-food enterprises is identified as indications. Finally, a discussion and cross-country comparison are provided (see Figure 5-1).

Figure 5-1: Overview of Chapter 5 "Exploration of trade relationships along the most relevant trade flows"



Source: Own elaboration

5.1 Exploration methodology

The information collected from the statistical database in the preceding Chapter 4 will be evaluated with the help of expert interviews with food business enterprises from the selected agri-food sectors (cereals, meat, fruit and vegetable, olive oil).

The set of interviews with the experts has the objective to generate insights into the cross-border transaction and the governance of the cross-border transaction. In other words, this exploration analyses the relationships between companies, e.g. how companies do business in each sector, the type of contracts they have and other factors that are important to them. In the investigation only enterprises active on the international markets are included.

Data collection

The following criteria are inquired during the interviews with the experts:

- players involved in import/export processes;
- type of governance between cross-border chain levels (spot market transactions, long-term relations);
- type of contracts (informal contracts, formal contracts, duration of the contracts);
- existence of quality or environmental certificates.

The selection of the enterprises is based on different preconditions:

- The enterprises must be involved in external trade of one of the agri-food products in the cereals, meat, fruit-&-vegetable or olive oil sectors;
- The enterprises must be small, medium-size or large-scale enterprises;
- The enterprises must be producers, processors or wholesalers along the supply chain.

To determine the nature of international trade relationships and the contracts between the business partners abroad, key players from different countries need to be asked.

The selection of the countries corresponds to the selection for the international trade flows, which was carried out in Chapter 4, i.e. the following states:

- Within the European Union: **Germany, Austria, Slovenia, Italy, Greece, Spain;**
- Trans-European cross-border: **USA, Brazil and Turkey.**

The interviews took place in the period from early January to May 2008. Each interview was a 20-minute face-to-face or telephone interview.

The questionnaire was put together as open questions regarding the criteria mentioned above. The interview was executed in the form of a questionnaire in which the interviewees had to confide the type of the relations with their business partners abroad, whether they sign contracts, and if certification plays a role. The interview was interactive.

The interview started with an introduction of the topic and a description of the objective. The results were noted during the conversation and presented at the end. The gained findings are analysed and discussed below. First the findings of the German agri-food companies are provided per enterprise in every selected sector. Second, the situation of the agri-food enterprises in the other countries is shown, and due to the small size of the results, the findings will be considered as indications.

5.2 The nature of trade relationships of German agri-food enterprises

This section examines three German agri-food chains (cereals, meat, fruit and vegetable sectors) which have been selected based upon the criteria of relevance, as described above. The agri-food chains are analysed with respect to external trade relationships. Expert interviews were conducted with agri-food businesses which are involved with external trade. Table 5-1 provides

a general overview of the interviewed enterprises and the analyses concerning each sector are presented in-depth in the respective subchapter.

Table 5-1: Overview of the conducted interviews – Food trade flow analysis

Sector	Chain level	Numbers of interviews (import)	Numbers of interviews (export)
Cereals	Grain trade	4	5
	1. Processing industry level	5	5
	2. Processing industry level	4	7
Meat	Slaughtering level	1	1
	Processor	4	2
	Wholesaler	8	6
Fruit	Wholesaler (fresh fruit)	4	2
	Processing industry level	3	-
Vegetables	Wholesaler (fresh vegetables)	2	2
	Processing industry level	-	1

Source: Own elaboration

5.2.1 Cereal sector

Importing / exporting enterprises of farm level products

In detail, on the farm level of the cereal chain, six enterprises have been interviewed; three of these deal with the import and export of wheat, maize and barley; one only with import and two only with export. Based on the interviews, a number of tendencies regarding the business relations and the contracts can be identified. Normally short-term written contracts are concluded by the importing companies due to the dependency on the results of the harvest. The importing firms dominate with long-term relations, and the exporting firms with short-term contracts. At this chain level most German and European traders are certified according to ISO 9001:2000 inclusive HACCP, QS and GMP+ - B2 regarding the import as well as the export's exchange (see Table 5-2).

Table 5-2: Results of the interviewed enterprises at farm level in cereal sector

Nr.	Product	Interviewed enterprise	Business Partner	Traded country	Type of relations	Type of contracts	Quality Standards
1	Wheat, maize, barley	Grain trade	Import	FR, NL, BE, PL	long-term	formal contracts	ISO 9001:2000; GMP+ - B2
			Export	BR, NO, CA, KZ	long-term	formal contracts	ISO 9001:2000; GMP+ - B2
2	Wheat, maize, barley	Grain trade	Import	FR, NL, CZ, PL, GB, ES	long-term	formal short-term	GMP+ - B2, GTP
			Export	SA, DZ, MA, JO, TN	long-term	formal short-term	GMP+ - B2, GTP
3	Wheat, maize, barley	Grain trade	Import	CZ, HU, SI	long-term	formal short-term	ISO 9001:2000; HACCP; GMP+ -B2
			Export	IT, NL, BE, LU etc.	long-term	formal short-term	ISO 9001:2000; HACCP; GMP+ -B2
4	Wheat	Grain trade	Import	SI	long-term	formal short-term	ISO 9001:2000; QS; GMP+ -B2
5	Wheat	Grain trade	Export	NL, BE	long-term	formal short-term	ISO 9001:2000; GMP+ - B2
6	Wheat, *barley*	Grain trade	Export	NL, BE; (*barley*), SA	long-term	formal short-term	ISO 9001:2000; QS; GMP+ -B2

Source: Own elaboration * formal short term=1 to 6 months;

Importing / exporting enterprises at 1st processing industry level

Two mills and three malt houses which are importing and exporting were interviewed. The establishment of holdings is characteristic at this stage. Horizontal and also vertical co-operation of the individual enterprises generate synergies and advantages, e.g., like optimization in the grain procurement, optimization of the logistics, quality assurance and production development, and simplification of the commercial completion both inland and outland. The interviewed enterprises conduct long-term relations with the foreign companies. The contracts of the mills are mainly short term (1 to 6 months) and the malt houses sign middle-term contracts with a period of validity of 12 months on average. All interviewed enterprises are already certified according to ISO 9001:2000. The enterprises of the flour industry have additional certification, such as IFS, GMP 13, QS, BRC and BIO (see Table 5-3).

Table 5-3: Results of the interviewed enterprises at 1st processing industry level in cereal sector

Nr.	Product	Interviewed enterprise	Business Partner	Traded country	Type of relations	Type of contracts	Quality Standards
1	Flour	Producer - processor	Import	FR (barley)	long-term	formal short-term	IFS; ISO 9001:2000; HACCP; GMP13/QC; BRC
			Export	LY, JP, BF etc.	long-term	formal short-term	IFS; ISO 9001:2000; HACCP; GMP13/QC; BRC
2	Flour	Producer - processor	Import	US, CA (grain)	long-term	formal short-term	IFS; ISO 9001:2000; HACCP; GMP13/QC; BIO
			Export	NL, BE, LU and third countries	long-term	formal short-term	IFS; ISO 9001:2000; HACCP; GMP13/QC; BIO
3	Malt	Producer-processor	Import	FR, NL, UK, DK (barley)	long-term	formal middle-term	ISO 9001:2000; ISO 22000:2005
			Export	EU, RU	long-term	formal middle-term	ISO 9001:2000; ISO 22000:2005
4	Malt	Producer - processor	Import	FR, NL, GB, DK (barley)	long-term	formal middle-term	ISO 9001:2000; GMP13/QS
			Export	JP, CH, VE etc.	long-term	formal middle-term	ISO 9001:2000; GMP13/QS
5	Malt	Producer-processor	Import	FR (barley)	long-term	formal middle-term	ISO 9001:2000; HACCP; QS; GMP07/QC; GMP13/QS
			Export	JP, US, South America	long-term	formal middle-term	ISO 9001:2000; HACCP; QS; GMP07/QC; GMP13/QS

* formal short term=1 to 6 months; formal middle term= 6 to 24 months

Source: Own elaboration

Importing / exporting enterprises at 2ndprocessing industry level

In this section the results of the expert interviews with the importing and exporting companies of the baking goods industries and breweries are discussed. A characteristic of these enterprises is that they deal with known business partners and their relations with them are long term. But the contracts are concluded only for a short period, at a maximum of 12 months. Only two of the exporting breweries also conclude long-term contracts – up to five years – with special customers.

The German baking-goods manufacturers and importers are certified by IFS and BRC standards; the German beer manufacturers must follow the ISO 9001:2000 standard and the beer is produced according to the purity law (see Table 5-4).

In general, at all levels external trade is conducted mainly with member countries of the European Union. In addition, the relationships in the cereal sector are stable as most transactions are long-term collaborations with known partners. The quality and proof of the quality through certification play an essential role in the cereal sector.

Table 5-4: Results of the interviewed enterprises at 2nd processing industry level in cereal sector

Nr.	Product	Interviewed enterprise	Business Partner	Traded country	Type of relations	Type of contracts	Quality Standards
1	Beer	Producer-processor	Import	FR	long-term	formal short-term	no data
			Export	AT	long-term	formal short-term	no data
2	Beer	Trader	Import	CZ	long-term	formal middle-term	no data
3	Pastries	Trader	Import	US, BE, IT, FR, NL, JP, CH	long-term	formal short-term	ISO 9001:2000; BIO
			Export	US, BE, IT, FR, NL, JP u. CH	long-term	formal short-term	ISO 9001:2000;
4	Pastries	Trader	Import	GB	long-term	formal middle-term	EC-Eco-Regulation
5	Beer	Producer-processor	Export	US, NL, IT	long-term	formal contracts	ISO 9001:2000; Reinheitsgebot
6	Beer	Producer-processor	Export	IT, ES, GB, IE, RU, CA, CN, TH, JP etc.	long-term	formal long-term	ISO 9001:2000; HACCP; Reinheitsgebot
7	Pastries	Producer-processor	Export	BE, LU, GB etc.	long-term	formal middle-term	IFS; BRC
8	Pastries	Producer-processor	Export	AT, FI, CN, US	long-term	formal middle-term	IFS; BRC; BIO
9	Pastries	Trader	Export	SE, ES, IT etc.	long-term	formal short-term	IFS; BRC

* formal short term=1 to 6 months; formal middle term= 6 to 24 months; formal long term=longer than 24 months
Source: Own elaboration

5.2.2 Meat sector

Importing / exporting enterprises of farm level products

Table 5-5 displays the results of the expert interview with a representative from the slaughterhouse dealing with import and export from and to Germany. The enterprise imports livestock from mostly the Netherlands and Austria. Their transactions are arranged through informal contracts with their long-term business partners. The exports of livestock go to Scandinavia, Italy and Greece, and the slaughterhouse repeatedly transacts with their business partner in a long-term relationship and does not use formal contracts (see Table 5-5).

Table 5-5: Results of the interviewed enterprises at farm level in the meat sector

Nr.	Product	Interviewed enterprise	Business Partner	Traded country	Type of relations	Type of contracts	Quality Standards
1	Fresh beef and pork	Slaughter-house	Import	NL, AT	long-term	informal	ISO 9001; ISO 14001; QS, IFS, BRC; BIO
	Fresh and frozen beef and pork		Export	Scandinavia, IT, GR	long-term	informal	ISO 9001; ISO 14001; QS, IFS, BRC; BIO

Source: Own elaboration

Importing / exporting enterprises at 1st processing industry level

On the first processing level (slaughtering) long-term relationships are predominant. The transactions are arranged either with formal and informal contracts. The descriptive research of the statistical data revealed that The Netherlands and Denmark are the most relevant importers for fresh and frozen beef and pork. Not surprisingly, the interviewed enterprise representatives supported this statement.

All four processors were asked to outline their relations with their foreign exchange partners, the required certification and the type of intermediary service. The expert interviews revealed that their relationships can be identified as long term; however, each company has a different system of contracting. Two of the food associations do not have any written contracts with their business partners; the other two prefer contracts of different lengths (up to 6 months, and longer than 24 months). But all of the contacted enterprises use the service certification institutions. Required certifications were IFS, QS, BRC, ISO 9001:2000 (see Table 5-6).

Table 5-6: Results of the interviewed enterprises at 1st processing industry level in the meat sector

Nr.	Product	Interviewed enterprise	Business Partner	Traded country	Type of relations	Type of contracts	Quality Standards
1	Fresh pork	Processor	Import	DK	long-term	formal short-term	BRC; IFS; QS; BIO
	Processed pork / ham		Export	EU; USA	long-term	formal short-term	BRC; IFS; QS; BIO
2	Ham and sausages	Processor	Import	DK, NL	long-term	informal	ISO 9001; ISO 22000; QS, IFS
	Fresh and frozen pork / ham, sausages		Export	NL, AT	long-term	informal	ISO 9001; ISO 22000; QS, IFS
3	Smoked pork chop	Processor	Import	DK	long-term	informal	ISO 9001;QS
4	Processed sausage spread	Processor	Import	NL, DK	long-term	formal long-term	IFS, BIO

* formal short term=1 to 6 months; formal long term=longer than 24 months

Source: Own elaboration

Importing / exporting enterprises at 2nd processing industry level

Several expert interviews with representatives of enterprises which are suppliers for fresh, frozen and processed beef and pork were conducted.

All of the interviewed companies manage their transactions with companies already known to them and the nature of the contracts that are concluded with the business partners abroad can be either informal or formal and long term.

The quality begins with the raw products. Thus, all of the key players apart from one company obtain their supplies exclusively from selected enterprises that are well known to them. All suppliers are subject to strict controls and are audited by staff from certification institutions. Quality standards are provided by certification in accordance with the standards ISO 9001:2000, QS, BRC, IFS (see Table 5-7).

Table 5-7: Results of the interviewed enterprises at 2. processing industry level in the meat sector

Nr.	Product	Interviewed enterprise	Business Partner	Traded country	Type of relations	Type of contracts	Quality Standards
1	Fresh and frozen beef and pork	Wholesaler	Import	ES; IT; AR	long-term	formal short-term	ISO 9001; BIO
			Export	NL; BE; FR	long-term	formal short-term	ISO 9001; BIO
2	Fresh, frozen and processed meat	Wholesaler	Import	PL and ES	long-term	formal long-term	ISO 9001:2000; QS, IFS
			Export	FI, SE, DK, UK, NL; RO, LV, LT; RU	long-term	formal long-term	ISO 9001:2000; QS, IFS
3	Fresh and frozen beef	Wholesaler	Import	BR, AR, NZ	long-term	informal	no
			Export	GR, PL, CH	long-term	informal	no
4	Fresh, frozen and processed pork	Wholesaler	Import	NL, BE	long-term	informal	QS, BRC, IFS
			Export	SE; AT	long-term	informal	QS, BRC, IFS
5	Fresh, frozen and processed meat	Wholesaler	Import	AR, BR, NZ	long-term	formal short-term	IFS
			Export	BE, UK	long-term	formal short-term	IFS
6	Fresh, frozen and processed meat	Wholesaler	Import	South America, AU, NW	long-term	formal long-term	EU-certified
			Export	SE; AT	long-term	formal long-term	EU-certified
7	Fresh, frozen pork, beef	Wholesaler	Import	BE, ES, NL	long-term	informal	QS, BIO
8	Fresh and processed pork	Wholesaler	Import	IT, FR; BE; ES	long-term	formal middle-term	BIO, IFS

* formal short term=1 to 6 months; formal middle term= 6 to 24 months; formal long term=longer than 24 months
Source: Own elaboration

In terms of the trade relationships that were discussed above, the interviewed enterprises revealed that they prefer to conduct business with partners already known to them. The nature of the contracts is different, with both formal and informal types being identified. The quality standards are very relevant and most of the enterprises are certified and expected by their foreign partners in accordance with the standards ISO 9001:2000, QS, BRC, IFS.

5.2.3 Fruit sector

Importing / exporting enterprises of fresh fruit

The German production of fresh fruit is traded mostly by producer organisations and specialised wholesalers. Besides producer organisations, also wholesalers in Germany undertake exports of

fresh fruit. Among the wholesalers, a distinctive trade occurs as they are mainly responsible for the imports and exports of fresh fruit.

The conducted interviews with the representatives of the food enterprises at the wholesalers' level uncovered relationships with well-known exchange partners (see Table 5-8).

While banana-related transactions are contractually guaranteed using mainly long-term contracts, the trade in apples involves mostly short-term contracts. All interviewed enterprises at the wholesale level are certified, and the following certificates play an important role: QA, Global Gap, IFS, BRC and BIO.

Table 5-8: Results of the interviewed enterprises of fresh fruits

Nr.	Product	Interviewed enterprise	Business Partner	Traded country	Type of relations	Type of contracts	Quality Standards
1	Bananas	Wholesaler	Import	EC, CO	long-term	formal long-term	GlobalGAP, IFS, QS
2	Bananas	Wholesaler	Import	EC, CO	long-term	formal long-term	GlobalGAP, IFS, QS
3	Apples	Wholesaler	Import	IT	long-term	formal short-term	IFS, HACCP, BIO
4	Apples	Wholesaler	Import	IT	long-term	formal short-term	IFS, BIO
5	Apples	Wholesaler	Export	Scandinavia	long-term	formal short-term	QS, GlobalGAP, IFS
6	Apples	Wholesaler	Export	DK, NL	long-term	formal short-term	GlobalGAP, BRC, IFS

* formal short term=1 to 6 months; formal long term=longer than 24 months
Source: Own elaboration

Importing / exporting enterprises of processed fruit

For the juice-importing processing industries – representatives of which are interviewed – well-known relations and long-term contracts play a big role in the import of their products (see Table 5-9). The used certificates that are mentioned are mainly SGF / IRMA control systems.

Table 5-9: Results of the interviewed enterprises of processed fruits

Nr.	Product	Interviewed enterprise	Business Partner	Traded country	Type of relations	Type of contracts	Quality Standards
1	Orange juice, apple juice concentrate	Processing Industry	Producers, Brokers	BR, CH, PL, CN	no data	no data	ISO 14001
2	Orange juice concentrate, apple juice concentrate	Processing Industry	Brokers, agents	BR	long-term	formal long-term	SGF / IRMA control systems
3	Orange juice, apple juice concentrate	Processing Industry	Traders	BR, CH, PL, CN	long-term	formal long-term	IFS, SGF

* formal long term=longer than 24 months
Source: Own elaboration

Expert interviews were conducted as in previous sections to enrich the quantitative description of international trade relationships above. The interviews revealed that the German enterprises, which are internationally active in the fruit sector, transact with well-known foreign partners. The governance structure of their relationship involves contracts which may vary from short term (1-6 months) to long term (longer than 24 months).

5.2.4 Vegetables sector

Importing / exporting enterprises of fresh vegetables

As in previous sections, additional expert interviews were conducted to gain insights into the relationships between domestic businesses and foreign trade companies. Table 5-10 presents some of the findings derived from the expert interviews with two wholesalers who import cucumbers and tomatoes into Germany and two wholesalers who export onions or cabbage. Long-term relationships and mainly formal contracts of up to 6 months are common business practice for both businesses. Also, the businesses claimed to follow the certifications ISO 9001, QS and IFS.

Table 5-10: Results of the interviewed enterprises of fresh vegetables

Nr.	Product	Interviewed enterprise	Business Partner	Traded country	Type of relations	Type of contracts	Quality Standards
1	Cucumbers	Wholesaler	Import	ES	long-term	formal short-term	none
2	Tomatoes, cucumbers	Wholesaler	Import	NL	long-term	formal long-term	IFS, BRC, EC-Eco-Regulation
3	Onion	Wholesaler	Export	CZ	long-term	formal short-term	ISO 9001, QS, IFS
4	White and red cabbage	Wholesaler	Export	SE, CZ	unknown	formal short-term	IFS, EC-Eco-Regulation

* formal short term=1 to 6 months
Source: Own elaboration

Importing / exporting enterprises of processed vegetables

An expert interview was conducted with a representative from the business in the processing industry which exports dried peas to Denmark. As in all previous sections of trade relationship identification, the expert interview revealed that business relationships are conducted on a long-term basis. Contracts are applied with a maturity of more than 24 months. The interviewed expert claimed that several certifications are required to be able to trade with foreign partners. The results of this interview are depicted in Table 5-11.

Table 5-11: Results of the interviewed enterprises of processed vegetables

Nr.	Product	Interviewed enterprise	Business Partner	Traded country	Type of relations	Type of contracts	Quality Standards
1	Dried peas	Processing Industry	Wholesalers, retailers	DK	long-term	formal long-term	ISO, IFS, TÜV, EC-Eco-Regulation

* formal long term=longer than 24 months
Source: Own elaboration

As already stated in previous sections, the analysis of the vegetables sector included several expert interviews. Summarising, long-term relationships are typical between the enterprises and the maturity of contracts is between short term and long term. The precise results are shown in the appropriate sections above.

5.3 The nature of trade relationships of European and cross-border agri-food enterprises as indications

This subchapter provides insights into the European and cross-border agri-food enterprises in the cereals, meat, fruit and vegetable, and olive oil sectors, which have been selected based upon the criteria of relevance, as described above. The agri-food chains are analysed with respect to international trade relationships. Expert interviews were conducted with agri-food businesses which are involved with external trade. Due to the smaller number of the interviews, the following findings can be used only as indications.

5.3.1 The case of Austria

Cereals sector

Trading with cereals in Austria is mainly focused on a regional level. Therefore, trading partners normally know each other, and long-term relationships are common. Even if price and market fluctuations occur, contracts between trading partners are normally fulfilled. Due to rising prices in the last few years, contracts now tend to be shorter and negotiated at a maximum of one year, in order to reduce risks on both sides. As mentioned in the interviews, smaller traders often cannot accept this loss of profit, so companies prefer to trade with companies of a certain size. A good and trusting relationship seems to be of importance. It has to be mentioned that the certifications as HACCP and GMP play a key role in this sector, when looking for new partners. In general, the value chain of cereals in Austria is characterised by mid- and long-term trade structures. Due to the small size of Austria, trading partners know each other, and relationships are mostly characterised by a trusting interaction of trading partners (fulfilment of contracts, agreements on product qualities etc.) (FRITZ ET AL. 2008).

5.3.2 The case of Italy

Cereals sector

From the information from the interviewed enterprises along the cereal chain in Italy, it can be concluded that in the import/export relationship contracts are rather standardised and usually very formal documents. Both spot and long-term contracts are widespread in the market. The aim of some of the companies is to establish direct contacts in the export countries in the long run. At the moment, some of the enterprises are not oriented towards setting up long-term contracts because the market is quite volatile, but rather seek long-term relationships. The most important critical factor inducing companies to choose between the spot and long-term contract is convenience of price.

The main problems arrive when there are strikes or when the climate (cold weather) can affect the quality of the products. However, the quality of cereal products is guaranteed by a great number of certification labels (FRITZ ET AL. 2008).

Meat sector

Most of the enterprises in the meat sector in Italy maintain strong business relationships and set up long-term business relationships. This is more likely to happen in those countries which are characterised by eating habits that are very similar to the Italian habits. In countries where the cultural distance is higher, business relationships are more “spot”.

In the poultry sector contracts are rather formalised, but they are not usually long-term contracts. The most important competitive factor is price, which is quite volatile over time; therefore companies prefer to deal in spot prices. The quality of meat products is guaranteed by a large number of certifications (FRITZ ET AL. 2008).

Fruit sector

Products are usually certified according to different national and international standards. EMAS, ISO9000, IGP and organic certifications are the most important, but other certifications are also important for penetrating the distribution market. Globalcap is a specific certification required by distribution companies in Italy. The enterprises in the Italian fruit sector try to establish long-term formal relationships with customers concerning quality, logistics and payment clauses. However, contracts are mainly spot because prices are volatile and depend on the market path. The experience of the interviewed firms shows that new markets are congested in different places of the world according to different criteria. Whereas low income and developing countries seek quality, developed countries, where quality is generally high, seek a low price. Therefore, the dynamics of international trading relationships is quite different depending on the standards of living of the population (FRITZ ET AL. 2008).

Olive oil sector

The politics of the enterprises in the Italian olive oil sector is mainly organised by working through agreements with people who can be trusted and to establish long-term business relationships with suppliers and customers. Spot contracts are quite broaden and contracts are very formal in this sector. Contracts are formal, and bureaucracy often represents a large obstacle to business.

Agents often play a role in setting up contracts. Contacts are established with all kinds of distribution channels (retailers, wholesalers).

The olive oil produced by the Italian companies of the interviewed representatives is certified by many labels such as ISO, BRC, IFS and HACCP (FRITZ ET AL. 2008).

5.3.3 The case of Slovenia

Cereals sector

According to the representative interviewed, the company in the Slovenian cereal sector avoids conducting business with unknown partners; thus they had not looked for new ones in the last few years. Their business contracts are of a short-term nature. The cereal products are certified by the HACCP standard (FRITZ ET AL. 2008).

Meat sector

The results of the meat sector in Slovenia show that companies are interested in establishing long-term formal relationships with their partners in order to guarantee constant quality and reliability. Slovenian meat production is more or less well organised. Especially poultry production takes place within big enterprises, which are very well organised vertically, and on private farms. These farms have individual, mainly long-term contracts with enterprises, which

buy their animals, and they often also supply them with different equipment or provide services. As for beef production, it is often organised through cooperatives.

The meat products are certified according to standards such as ISO 9001:2000, HACCP; IFS or Higher quality (Slovenian standard) (FRITZ ET AL. 2008).

Fruit and vegetables sector

The structure of the Slovenian fresh fruit and vegetables sector consists of mainly small-sized companies which hold mostly individual long-term contracts with their business partners abroad.

The companies' transactions regarding processed fruit and vegetables are held by fixed relationships, although business contracts are mainly at a short-term level. They make formal contracts in standardised form, and they avoid carrying out business with unknown companies. The policy of the companies is geared towards looking for potential new business partners, but at the same time they emphasise that the most important ones are reliable partners with which they already have good experience.

Quality of their products is guaranteed by many certificates, which are a main prerequisite for selling their products successfully. They maintain the quality standards Globalgap, Nature's Choice and ISO 9001:2000 (FRITZ ET AL. 2008).

Olive oil sector

The olive oil sector has minor significance in the Slovenian agricultural and food sector, as well as in its trade.

Olives are mainly produced and processed on farm level. The number of Slovenian olive oil producers is small, and they sell their products mainly at the farm gate or at farmers' markets. The trade of the interviewed enterprises is based on formal relationships.

The olive oil is certified by Protected Designation of Origin (P.D.O.) or HACCP, ISO 14001 (FRITZ ET AL. 2008).

5.3.4 The case of Greece

Cereals sector

The Greek enterprises dealing with cereal products buy in a spot market in order to achieve lower prices; however, long-term relationships exist. Both in import and export relationships formal contracts exist.

To ensure quality there is an international agreement "Formule INCOGRAIN No12 C.A.F Maritime". In terms of raw and final product, all the leading mills provide ISO verifications and use HACCP to ensure quality (FRITZ ET AL. 2008).

Meat sector

In terms of meat imports to Greece, Germany is the second most important country (20%); similarly Italy in the central market of Athens (10%). During the summer period however, imports (specific meat parts) from Italy increase due to price reductions. Regarding pork

imports, in CMMT these are coming from the Netherlands (40%) and Belgium (40%), while in CMMA, 70% come from the Netherlands. According to the interviews in the CMMT, wholesalers are mainly importing meat from abroad. There are two main channels when arranging imports. The first is direct contacts with slaughterhouses in France (e.g. for beef) or with representatives from big European meat companies that hold offices in Athens. In general, wholesalers often try to maintain long-term relationships with these companies although the buying behaviour is dependent almost completely on price (given that certain meat quality and safety criteria are met due to EU laws and regulations). In addition, only a limited number of wholesalers use formal contracts, which is not common practice (FRITZ ET AL. 2008).

Fruit and vegetables sector

Within the fruit and vegetables sector in Greece, most transactions are not contract based, particularly when the sourcing comes from Turkey and neighbouring countries. Wholesalers keep long-term relationships, but the price is the most important criterion. No purchasing from spot markets takes place (FRITZ ET AL. 2008).

Olive oil sector

Most transactions are contract-based, and usually the contracts are signed prior to the harvest period. To a great extent the interviewed company has long-term relationships with the buyers. Occasionally, the company sells to some buyers on a short-term basis, where contracts are still used (FRITZ ET AL. 2008).

5.3.5 The case of Spain

Cereals sector

In the Spanish cereal sector phenomena of vertical and horizontal integration take place. The vertical integration between the companies of the agrarian phase and the wholesale commerce in origin is handled by cooperatives. It must be emphasized that in only a percentage of the cooperatives is there real discipline between the partners where a strategy of joint production is adopted. The operations between agriculturists and stores are transactions in the open market; in some cases a stable relationship and prior agreements on the production have been established. This same situation is repeated between the wholesalers of different rank: the cooperatives of second degree maintain the strong vertical integration with their associates and the rest works in the open market.

Other phenomena of horizontal integration are related to big grain importers that work with oil seeds and take part in the oil, fodder and cattle production chain, wholesalers in origin that use to work with oil seeds and other seeds.

Furthermore, the statement mentioned above can be confirmed by the answers from the interviewed representatives of the enterprises, which set up mainly long-term relationships with their trading partners abroad and conclude either medium or long-term contracts. However, the quality of cereal products is guaranteed by a number of certifications, for example, HACCP or sanitary inspections (FRITZ ET AL. 2008).

Meat sector

The subsector of meat is constituted by many production subchains of production such as meat species. In some cases they have more than one function within a single species of the different production systems.

There also are other important figures in the meat supply chain like the refrigerating warehouse, which can be linked to the slaughter house, meat industry or the quartering hall. Also, it can maintain a relation of services with any one of the phases of the production chain. These warehouses play a fundamental supply function and, in addition, are key to the intervention mechanisms.

The interviewed companies deal mainly with known business partners but the concluded contracts between the processors and retailers are mostly short term; however, the farmers sign long-term agreements with their partners abroad. The certifications such as IGP (Ternera Avillena), ecological labels and all those dependent on sale markets standards are of major importance in the sector (FRITZ ET AL. 2008).

Fruit and vegetables sector

In the Spanish fruit and vegetables sector two markets exist with many intermediate situations:

- production aimed at large-scale distribution and, to a lesser extent, export. Their characteristics are the off-season high levels of organisation, the existence of large operators and the control of the product. In this segment medium-term agreements are predominant and the market of products is diminishing the passage by central markets. It shows a tendency towards verticalization with two main operators in origin and destination with intermediaries' services.

- season and inner markets destined to the traditional channels. It is a much more disorganised market, whose agents are more fragmented, and characterised by the weight of the auctions and agreements of transaction in the open market.

Traditional channels are less organised and have a long network operator depending on the geographical situation.

Some of these companies are between those of greater invoicing within the sector of fruit and vegetables. In the case of the interviewed enterprises the established relations with their suppliers and customers are primarily on a long-term basis with long-term contracts. Globalgap and BRC are as mentioned certifications (FRITZ ET AL. 2008).

Olive oil sector

The operating policy of the Spanish enterprises in the olive oil sector is mainly organised by working through agreements with people who are well-known, and establishing long-term business relationships with suppliers and customers.

The olive oil produced by the interviewed Spanish companies is certified by many labels such as IGP-Ecological certification (CCAE), and origin denomination and depends on the type of olive oil (FRITZ ET AL. 2008).

5.3.6 The case of the USA

Cereals sector

In the American cereal sector contract markets are the dominant form of exchange along both supply chains. Spot markets exist along both the wheat and grain sorghum supply chains; however they are not the primary method of exchange and their percentage is unknown (FRITZ ET AL. 2008).

Fruit and vegetables sector

No spot markets exist along the fresh grapefruit supply chain. Spot markets only exist along the apple supply chain when retailers need unexpected product due to excellent sales. In the case of mature export markets, this function of providing extra supply in the short-run due to increase demand falls on the wholesale market. Most trading grapefruit and apple transactions are based on a formal contract. No spot markets exist along either the prune or the raisin supply chain. Most dried plums are packed to order due to the temperature regulation needed to preserve the ideal dehydration ratio. No spot markets exist along the sweet-potato supply chain (FRITZ ET AL. 2008).

5.3.7 The case of Brazil

The conducted interviews with the Brazilian enterprises allow a broad and updated insight into the situation of the Brazilian agri-business sector regarding the international market.

Cereals sector

The commercial transactions of cereal products can be classified as “spot market” and “short-term relations“.

The nature of long-term relations and contracts is used in order to avoid the problems of oscillations of prices and mostly from the cereal processors (FRITZ ET AL. 2008).

Meat sector

The requirements of the importers include specification for the product, the facilities and the production process, and the production begins only after the contract finalization. Presently the export levels are lower due to the higher price in the domestic market. Due to international requirements regarding quality, the interviewed companies are in compliance with ISO 9001:2000 and HACCP certifications. According to the nature of the contracts, both spot and short-term contracts are used in trading. The most important factor inducing companies to choose between contracts is convenience in terms of price (FRITZ ET AL. 2008).

Fruit and vegetables sector

The production is characterised by high quality due to the climate conditions. The volume of exports to Europe has not been increasing recently due to the current unfavourable exchange rates. The established relations are long term. They export the products with free on-board FOB price. The contracts used in the transactions are FOB; therefore, the overseas logistics-related risks will be taken by the importers.

They do not have a contract, only a pre-agreement. If the product is well accepted in the market, there would then be negotiations, followed by the signing of a contract.

No certification at this first stage is necessary. They are "PIF" (Integrated Fruit Production) certified; they believe that in the case of a contract it would be necessary to obtain Globalgap certification. It is also important to emphasize that some Brazilian lemon producers are certified according to Globalgap. Payment guarantees are essential; therefore the companies only receive the payment in advance (FRITZ ET AL. 2008).

5.3.8 The case of Turkey

In all of the four sectors, it has been concluded that there is a connection between company scale and trade relations. Even though all kinds of trade relations can be observed, large-scale companies generally prefer to establish long-term relations with their trade partners, while medium and small-scale companies generally establish short-term relations. Especially small-scale companies tend to be in spot relations more than others. Spot selling is shaped in commodity exchange (FRITZ ET AL. 2008).

Cereals sector

In the cereal sector both spot and long-term contracts are more widely spread.

Meat sector

The Turkish poultry sector has shown rapid growth during the last few decades. The production of poultry products can meet domestic demand. 80% of the poultry enterprises have developed production and quality systems and they operate in international standards. 90% of the broiler production is based on contractual relations. Most of the processing plants have HACCP, ISO 9001, ISO 14001, TSE-ISO-EN 14000 certificates (FRITZ ET AL. 2008).

Fruit and vegetables sector

Due to small-scale production units, most of the time fresh products are collected by domestic collectors. In some cases, trader and farmer deal at the farm, and at harvest time the trader collects the product directly from the producer's farm. Relations between producers and processing companies are generally based on contractual relations. In some cases, big retailers deal directly with producers on a contractual basis. Producers may give their products to a cooperative or producers' union if they are a member.

Fresh-fruit and vegetable export and import are mainly handled by traders, producers' unions and some agricultural companies.

In the frozen-food sector, contractual relations show growing trends between producer and processor in order to provide appropriate variety for processing. In general, 30-40% of total processed raw material is procured by contractual relations; the rest is provided from a spot market, directly from producers or domestic wholesalers (FRITZ ET AL. 2008).

Olive oil sector

There are no direct export activities at farm level. Export is mainly done at trade and retail level. On the other hand, small-scale olive oil factories and merchants collect olive oil from producers, collectors or local olive oil processors and export them as bulk or into barrels. However, this kind of export activity is discussed at trade level.

In the olive oil sector there are 627 registered processing factories, most of which are small-scale. While 598 produce natural, 29 produce refined olive oil. In this sector there are 405 registered merchants and 421 merchant/export or producer/export companies. While some of the merchants just deal with export activity without producing olive oil, some have an olive-oil-processing factory and export their own product.

Definitions of quality, labelling marketing standards and chemical and physical characteristics are regulated by the *communiqué on "Turkish Food Codex"*, related horizontal communiqués and *communiqués on "Cooking Olive Oil and Cooking Pomace Oil"* specifying physical and chemical features of olive oil, the provisions on contaminants, residues, additives, hygiene, packaging and labelling. Turkey submitted an application to rejoin the International Olive Oil Council (IOOC).

At this stage, common quality certificates are: TSE 341 and TSE 341000 (Turkish Standard Institution- standards for olive oil), ISO, HACCP and Food Health Certificate that has been granted by the Turkish Ministry of Agriculture and Rural Affairs (FRITZ ET AL. 2008).

5.4 Summary

This chapter has highlighted the variety of type of trade relationships and contract policy in selected agri-food chains across Europe and trans-border countries.
This cross-country section provides and discusses the obtained results of the analysis using the situation of the individual countries presented above, and compares them with each other.
Differences and similarities will be observed in the selected countries (DE, AT, IT, SI, GR, ES, USA, BR, TR) and within the focused agri-food sectors (cereals, meat, fruit and vegetables, olive oil).

Figure **5-2** summarizes the pattern of relationships, contracts and required certifications in nine cereal chains. Regarding the type of transaction relations, it can be concluded that from the European enterprises, spot markets are identified only in Italy. On the side of the trans-border countries, the spot markets dominate as well. The role of contracts seems to be essential due to the fact that all companies arrange formal contracts, but the duration differs from short term (1-6 months) to long term (longer than 24 months). A diversity of certifications is required and the most prominent are: ISO 9001:2000, GMP, QS, and HACCP.

Figure 5-2: Cross-country comparison of the trade relationships in the cereal sector

Cereal sector

Chain level / Country	Farmers - Processors			Processors - Retailers		
	Relations	Contracts	Certification	Relations	Contracts	Certification
DE		+; ++; +++ formal	ISO 9001:2000; GMP; QS		+; ++ formal	ISO 9001:2000; GMP; QS; IFS; HACCP; BRC
AT		++; +++ formal	GMP		++; +++ formal	HACCP, GMP
IT		+++	number of certifications		+	number of certifications
SI		+	No data		+	HACCP
GR	No data	No data	No data		formal	ISO, HACCP, Formule INCOGRAIN
ES		++; +++	number of certifications		+	HACCP
USA		+++	No data		+++	No data
BR		formal	No data		formal	No data
TR		+++ +	No data		+++ +	No data

= Long-term relation; = Spot market; + = short-term; ++ = middle-term; +++ = long-term

Source: Own elaboration

In the meat sector long-term-oriented businesses are more likely to choose formal contracts of longer than 24 months. An exception is the situation in Italy and Greece where spot markets can be observed. Certification as ISO, IFS, IGP, HACCP, QS are very common in the meat sector. The comparison of the obtained results in the meat sector is shown in Figure 5-3.

Figure 5-3: Cross-country comparison of the trade relationships in the meat sector

Meat sector

Chain level / Country	Farmers - Processors			Processors - Retailers		
	Relations	Contracts	Certification	Relations	Contracts	Certification
DE		informal	ISO 9001:2000; QS; IFS; BIO; BRC		+; +++ informal / formal	ISO 9001:2000; QS; IFS; BIO; BRC
IT		+++	number of certifications		+++	number of certifications
SI		+++	ISO, IFS		+++	ISO, IFS, HACCP, Higher quality
GR		formal	EU laws and regulations		formal	EU laws and regulations
ES		+++	IGP, ecological labels		+	IGP, ecological labels
BR		+	ISO		+	ISO, HACCP
TR		formal	ISO, TSE-ISO-EN 14000		formal	ISO, HACCP, TSE-ISO-EN 14000

= Long-term relation; = Spot market; + = short-term; ++ = middle-term; +++ = long-term

Source: Own elaboration

With respect to the nature of the international business relations in the selected countries concerning the fruit and vegetables sector, it is evident that the long-term relations at all chain levels are prevailing. The arranging of contracts seems to be preferred and mainly for periods of longer than 24 months. The most requered certification are e.g. Globalgab, IFS, BRC, HACCP, QS. The gained findings are presented in Figure 5-4.

Figure 5-4: Cross-country comparison of the trade relationships in the fruit and vegetables sector

Fruits and vegetables sector

Chain level / Country	Farmers - Processors			Processors - Retailers		
	Relations	Contracts	Certification	Relations	Contracts	Certification
DE		+; +++ formal	QS; Globalgab; IFS; BIO;		+++ formal	QS; Globalgab; IFS; BIO; HACCP
IT		+++	No data		+++	
SI		+++	ISO, Globalgab, Nature's choice		+	ISO, Globalgab, Nature's choice
GR	No data	No data	No data		+	No data
ES		+++	Globalgab, BRC	No data	No data	No data
USA		formal	No data		formal	No data
BR		informal	PIF		informal	Globalgab
TR		formal	No data		formal	No data

= Long-term relation; = Spot market; + = short-term; ++ = middle-term; +++ = long-term

Source: Own elaboration

Similar to the other agri-food sectors, long-term relations with known companies dominate in the international olive oil businesses. Exceptions are the transaction exchange between processors and retailers in Italy, which deal on the spot markets as well. Certifications as ISO, HACCP, BRC, IFS, PDO, and CCAE are common. The comparable picture of the obtained results is provided below (see Figure 5-5).

Figure 5-5: Cross-country comparison of the trade relationships in the olive oil sector

Olive oil sector

Chain level / Country	Farmers - Processors			Processors - Retailers		
	Relations	Contracts	Certification	Relations	Contracts	Certification
IT		+++	ISO, BRC, IFS		+; +++	ISO, BRC, IFS, HACCP
SI		+++	PDO, ISO		+++	HACCP
GR	No data	No data	No data		+; +++ formal	No data
ES		+++	CCAE		+++	CCAE
TR	No data	No data	No data		formal	TSE 341, ISO, HACCP

= Long-term relation; = Spot market; + = short-term; ++ = middle-term; +++ = long-term

Source: Own elaboration

To conclude, mainly long-term orientation of the international transactions' exchanges within the cereals, meat, fruit and vegetables and olive oil sectors has been observed. An explanation

could be the fact that the long-term orientation facilitates businesses to build a trustworthy legal basis for planning and securing future supplies or sales.

While in the cereal chain spot markets are often evident as well, in the fruit and vegetables chains only well-known and trusted businesses are dealt with. In general, the arrangement of formal contracts is preferred by most of the interviewed enterprises and the duration varies between 6 months and longer than 24 months.

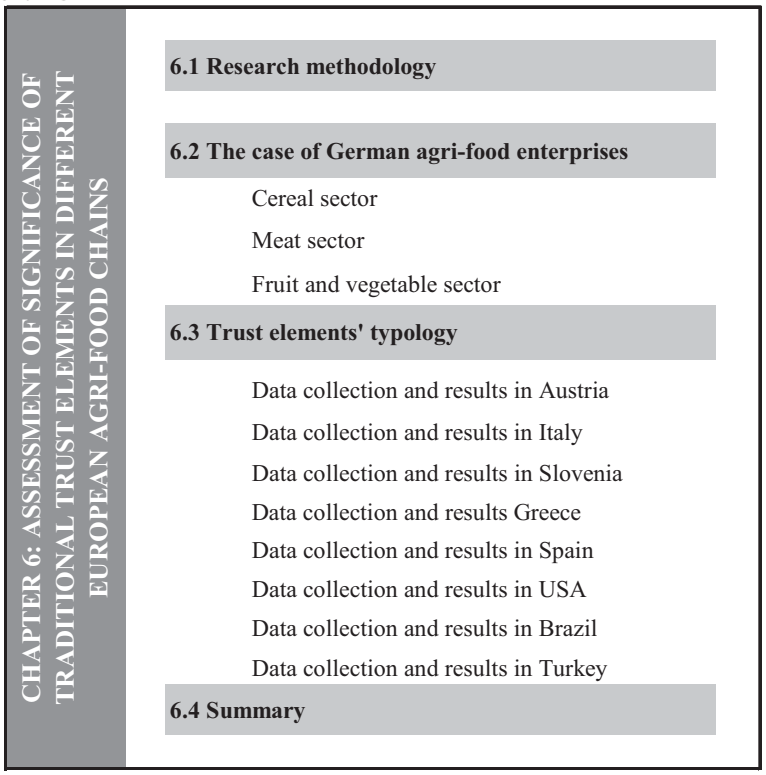
In addition, regulations relating to food quality and safety are required overall. The certification's orientation on the international transactions also proved to be a determinant for carrying out an external trade.

The findings from the obtained results suggest that the request of the agri-food enterprises for more personal relations explains their need for trusted exchanges.

6 ASSESSMENT OF SIGNIFICANCE OF TRADITIONAL TRUST ELEMENTS IN DIFFERENT EUROPEAN AGRI-FOOD CHAINS

The previous chapter provides an analysis about the nature of the trade relationships along the four agri-food chains in selected European and cross-border countries. The obtained findings show that the relationships between the international traders are predominantly long-term implying that they know each other and can trust each other. However, what can happen when the businesses need to search for a new supplier with whom they have not had a prior business relation and in whom they therefore have no trust? Are there any elements of trust which can help the establishment of the transaction and if so how can they be measured? The objective of this chapter is to evaluate the personal preferences of agri-food experts with respect to determined trust-building factors. As elaborated before in Chapter 3, trust-building factors are diverse. Hence, to achieve better and faster decisions, a priority of the trust-building elements is required. Using a decision support system offers a solution for an evaluation scheme. An appropriate decision support system is the analytical hierarchy process (AHP). In the following Chapter 6 the implementation of AHP for this thesis is explained step by step. First, the research methodology is defined. Afterwards the findings for the German agri-food enterprises in consideration of the research question are presented. Next, the evidence of the European and cross-border enterprises are presented and which can be used as indications. At last a summary of the chapter is provided (see Figure 6-1).

Figure 6-1: Overview of Chapter 6 "Assessment of significance of traditional trust elements in different european agri-food chains"



Source: Own elaboration

6.1 Research methodology

This chapter aims to establish the importance of trust-generating factors for German food importers of cereals, meat, fruit and vegetables. As elaborated before, trust-generating factors are numerous. Using a decision support system offers a solution by structuring the interview and providing a clear evaluation scheme. In fact the trust-generating factors are clearly separated into product-specific, seller-specific and market-environment-specific trust factors. Therefore it is possible to evaluate the trust factors in each category using paired comparisons to determine preferences. An appropriate decision support system is the analytical hierarchy process (AHP). The AHP adopts the concept of paired comparisons to determine the importance for multi-factored decisions. A direct evaluation of the importance of trust-generating factors can be made on a percentage basis. In this chapter the implementation of AHP for this work is explained step by step. First, the construction and procedure of AHP is defined. Afterwards, the case of German agri-food enterprises in consideration of the research question is shown. Finally, the results of the European and cross-border agri-food enterprises are provided as indications.

6.1.1 The Analytical Hierarchy Process (AHP)

To evaluate the importance of trust factors several decisions have to be made. The more factors that come into consideration the more confused and complex the decision becomes.

The analytical hierarchy process (AHP) invented in the late 1960s by Thomas L. Saaty is a method for planning and decision making that simplifies complex decision situations to find a comprehensible solution (MEIXNER AND HAAS 2002).

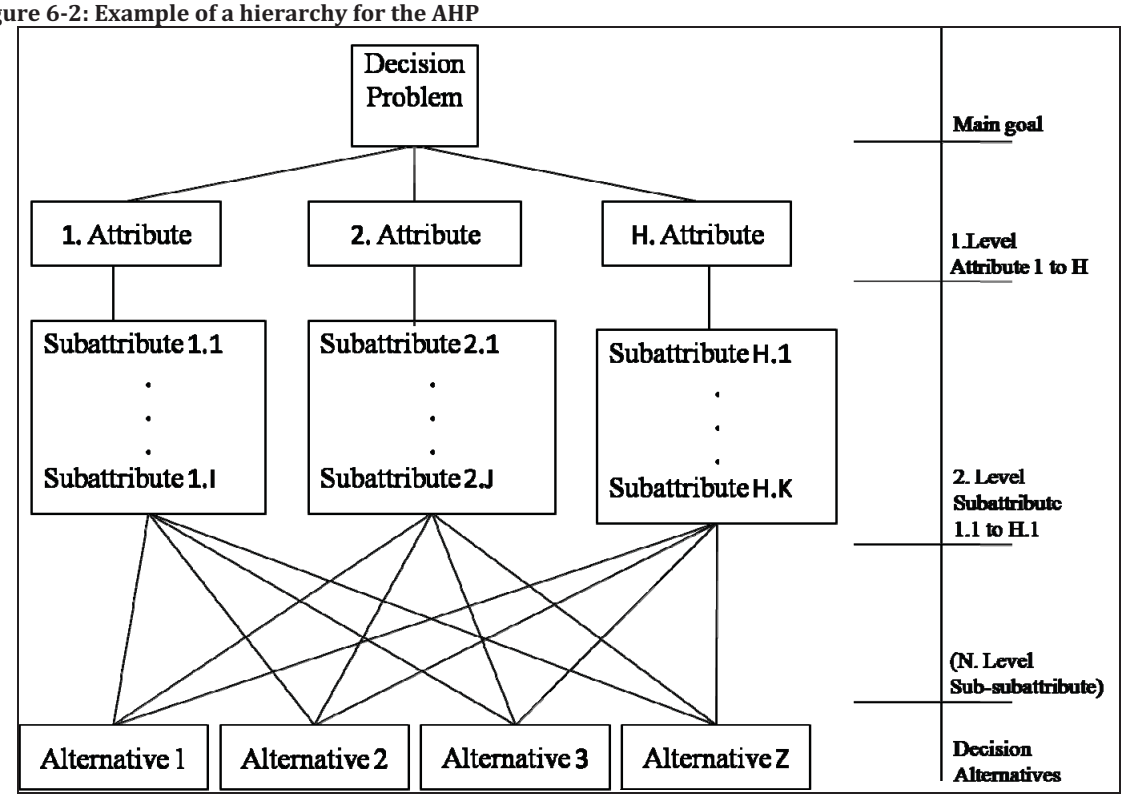
The definition of AHP can be described while regarding the meaning of the three letters: **A**nalytical **H**ierarchy **P**rocess.

An AHP is the analysis of a decision problem respecting all dimensions, factors and dependencies involved. This allows the possibility of a broad and intensive analysis without disregarding any influence factors. This can be regarded as the analytical part of the AHP.

A precondition for the analysis is to divide and classify the decision problem into single criteria or factors, which are aligned afterwards in the form of a hierarchy.

That means that the problem is structured regarding influence factors or attributes with respect to the decision problem. Those attributes themselves consist of sub-attributes. The sub-attributes can again be separated into influencing “sub-sub-attributes” and so on, until all problem-related terms are classified in a hierarchic model. By building this hierarchy the problem is structured and visualized. This is the hierarchy part of the AHP. Figure 6-2 shows a simple way to build a hierarchy.

Figure 6-2: Example of a hierarchy for the AHP



Source: Meixner and Haas 2002

The third important part is the process character of the AHP. The AHP is a process because the way to find the final decision is fixed rather than arbitrary. The decision is structured in several parts with clear instructions on what to do next. The sequence of steps in this process always remains the same. Consequently it can be used for many different decision problems (MEIXNER AND HAAS 2002).

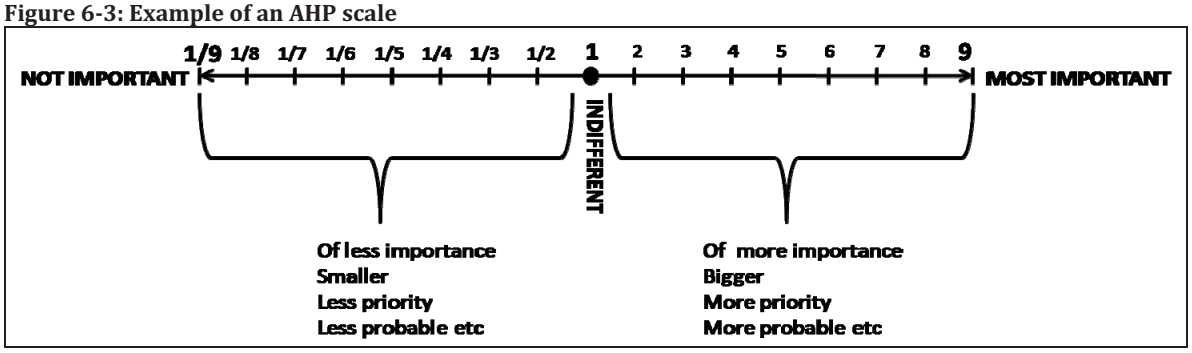
The starting point of the hierarchy is the decision problem that has to be solved respecting the main goal. Second follows the 1st level that lists attributes that are directly related to the decision problem. There can be more than three attributes.

The subordination of sub-attributes to the 1st level follows on the 2nd level. It is also possible to subordinate more sub-sub-attributes to the items of the 2nd level. This could be continued as far as is needed. Different combination of those factors could result in different decision alternatives.

After building a hierarchic structure out of the decision problem, the next step is a prioritization of the different attributes to work out the individual decision solution.

Due to the fact that human beings are able to make correlations between observed circumstances, a prioritization of the attributes can be achieved. The principle is that two attributes are compared to each other on the basis of a special criterion. The AHP uses paired comparisons of the attributes of the hierarchy. Every attribute of one level is compared in order to define the priority. The question is: Which factor is the most important? Which comes second? And so on. Realisation of the comparison is done with the help of a so-called AHP scale (see Figure 6-3). The scale uses nine nuances of different importance levels in each direction to compare two attributes with each other (MEIXNER AND HAAS 2002).

Figure 6-3: Example of an AHP scale



Source: Meixner and Haas 2002

Regarding the research question of this thesis, the AHP is considered to be used for evaluation of the importance of the different trust elements / factors. The adaptation of the AHP to the research question is presented in the next subchapter.

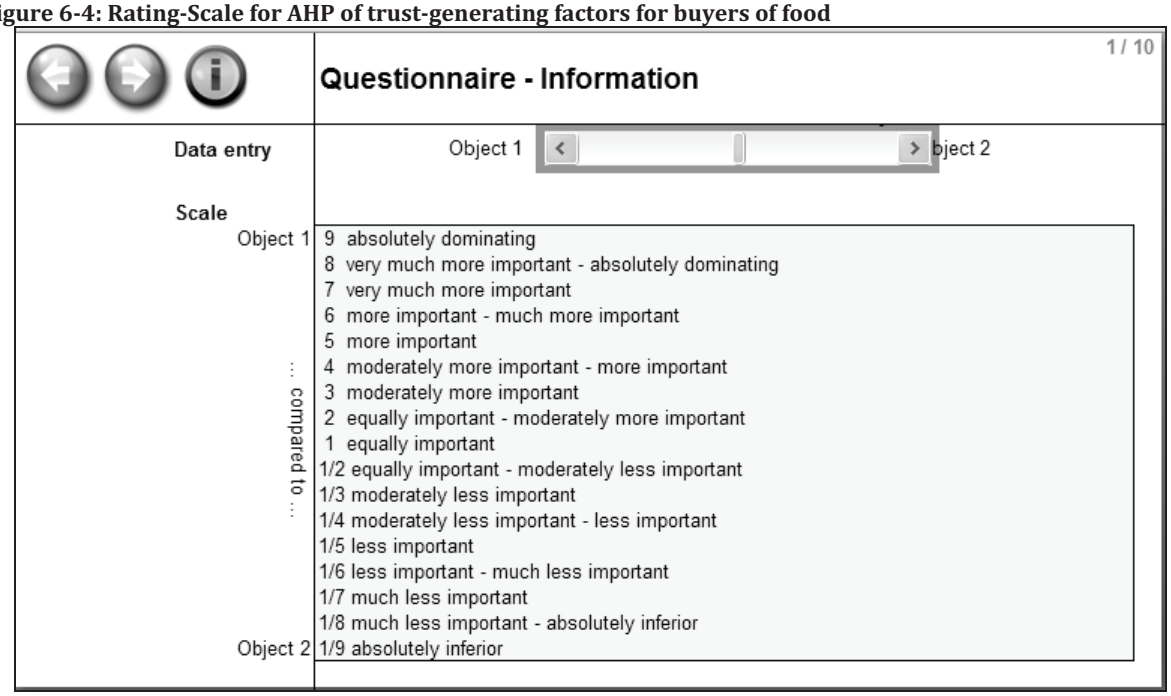
6.1.2 The Assessment

The analysis of trust elements for food-importing companies can be established through an AHP. The decision problem is shown to be: Which trust-generating factors are of higher importance compared to others for buyers of food in the case of a new seller?

The trust factors were analysed in Chapter 3.3 and apply to objects in a transaction like the product, the seller and the market environment (in this thesis elements and factors are used as synonyms). They can be regarded as attributes or objects of trust to build the first level of a hierarchy. The second level is the sub-attributes or dimensions of the objects of trust. For **product** the factors are: reputation, specification, inspection, certification and price / performance ratio. For the **seller** the factors are: capability, relationship with the seller (divided into relationship between the individuals and relationship between the companies), reliability of the seller (divided into adequate communication, deliveries and financial situation of the seller) and reputation of the seller. And for the factor **market environment** the dimension of the object of trust are: private control institution, informal institutions and public legal institutions (see Chapter 3.3).

The trust-generating factors can be arranged in the form of a hierarchy and this makes it possible to check the importance of the trust factors via AHP. The trust typology provides this hierarchic structure. Based on the computer program "Expert Choice©" (invented by MEIXNER and HAAS) a mask has been developed by HAAS et al. 2009 to generate a comprehensible AHP for this decision problem. The paired comparisons and prioritisation are inquired for each level of the trust typology. Two objects or factors are compared with the help of the AHP rating scale. The rating scale (see Figure 6-4) for this decision problem describes the intensity of the importance for the paired comparison of the trust-generating factors.

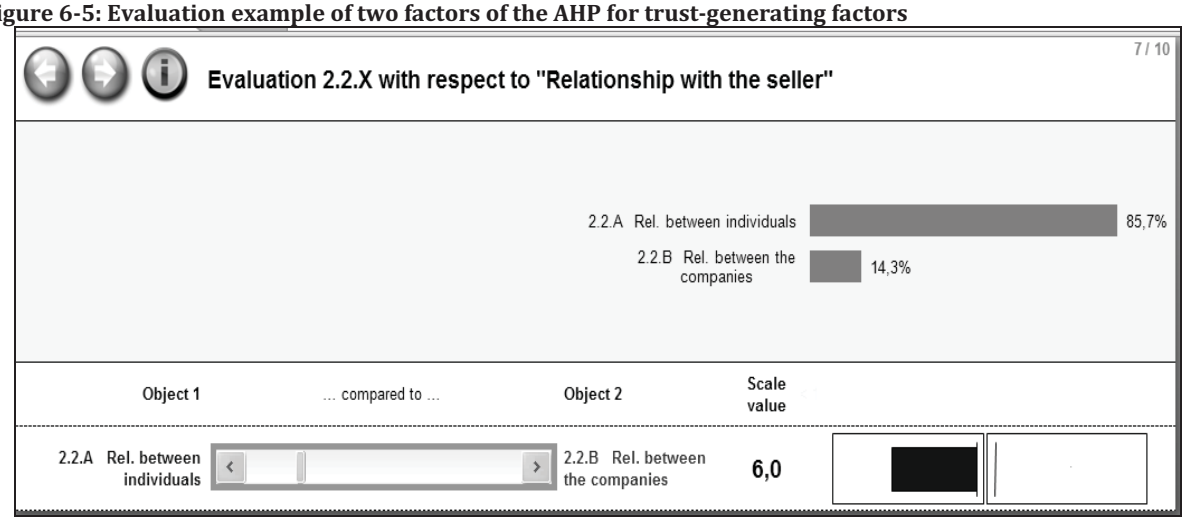
Figure 6-4: Rating-Scale for AHP of trust-generating factors for buyers of food



Source: Haas et al. 2009a

For example, the dimension of the object "relationship with the seller" is evaluated. The two sub-dimensions of this are "the relation between individuals" (object 1) and "the relation between the companies" (object 2). Inbetween the two factors there is a space with a scroll bar in the middle. Figure 6-5 shows a paired comparison where the bar is slid towards object 1 with the scale value of 6. This would mean that object 1 is between "much important to much more important" than object 2. In absolute percentage, object 1 is at 85.7% more important than object 2 at only 14.3% on this level.

Figure 6-5: Evaluation example of two factors of the AHP for trust-generating factors



Source: Haas et al. 2009a

This procedure is done for level-one objects of trust (product, seller, market environment), and for the dimensions of the objects of trust – level two (all factors concerning the product, all factors concerning the seller and all factors concerning the market environment are compared to

each other inside their groups). The same is done with the third level – the sub-dimensions of the objects of trust.

At the end, when all factors of all levels have been compared to each other, the computer program calculates and weights the absolute importance to derive the final relative percentage.

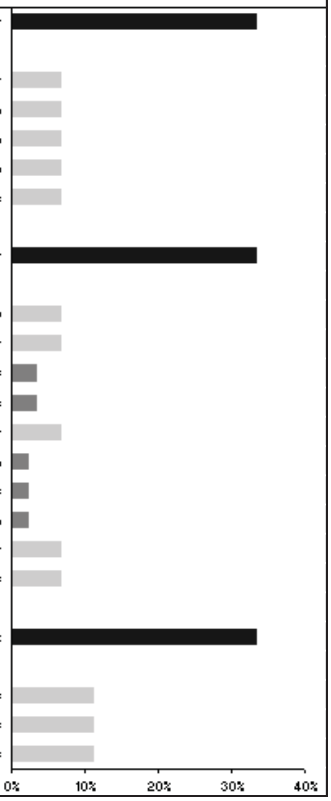
The percentages for each level of the typology are calculated, e.g. in level one the product of the seller is evaluated with 55.8% relative importance, second comes the seller with 33% relative importance and third the market environment with 11.2% relative importance. That can be interpreted concerning the object of trust – first level of the trust typology – as: the factor product is of prime importance followed by the object seller. Of less importance is the object market environment (see Figure 6-6).

To research data for the three sectors cereal-, meat-, and fruit-and-vegetable-importing companies, expert interviews for each of the three sectors are carried out. The procedure and the selection criteria are specified in the following.

Figure 6-6: Results of an evaluation example of the AHP for trust-generating factors

RESULTS

	Absolute Level 1	Level 2	Level 3	Relativ
1. Product of the seller	**33.3%**			33.3%
1.1 Reputation of the seller		20.0%		6.7%
1.2 Specification		20.0%		6.7%
1.3 Inspection		20.0%		6.7%
1.4 Certification		20.0%		6.7%
1.5 Price/Performance		20.0%		6.7%
2. Seller	**33.3%**			33.3%
2.1 Capability of the selling company		20.0%		6.7%
2.2 Relationship with the seller		20.0%		6.7%
2.2.A Rel. between individuals			50.0%	3.3%
2.2.B Rel. between the companies			50.0%	3.3%
2.3 Reliability of the seller		20.0%		6.7%
2.3.A Adequate communication			33.3%	2.2%
2.3.B Deliveries			33.3%	2.2%
2.3.C Financial situation			33.3%	2.2%
2.4 Reputy of the seller		20.0%		6.7%
2.5 Competence to solve problems		20.0%		6.7%
3. Market environment	**33.3%**			33.3%
3.1 Private control institutions		33.3%		11.1%
3.2 Informal institutions		33.3%		11.1%
3.3 Public legal institutions		33.3%		11.1%



Source: Haas et al. 2009a

6.1.3 *Selection criteria for the expert interviews*

To determine the importance of trust-generating factors in the cereal-, fruit-and-vegetable- and meat- sector, German food importers need to be asked. This can be achieved via expert interviews.

For this research objective the expert interview is focused on German food importers and trust-generating factors regarding first new business contacts with foreign suppliers. The first negotiations and first transactions are of particular importance for trust generation because potential risks and uncertainties are high as well as experiences being low (HOFESTEDE ET AL. 2007, FRITZ 2006). Trust develops fluently over time. The knowledge of the trust-generating factors can facilitate new contacts between suppliers and German buyers and increase competitiveness.

The selection of companies is based on different criteria. The chosen companies have to fulfill the following preconditions:

- The companies must be regular importers of one of the agri-food products in cereals, meat, or fruit and vegetables;
- The companies must be small, medium-size or large-scale enterprises;
- The companies must be producers, processors or wholesalers along the supply chain;
- The interviewees should trade with foreign sellers.

Interview candidates were selected with the help of internet platforms for suppliers trading in cereals, meat, or fruit and vegetables in unprocessed and processed form. The companies were contacted, and the topic was explained. In cases where the preconditions were fulfilled and a potential interviewee signaled interest they were asked if they were willing to participate. In the case of an agreement an interview date was arranged.

The interviews took place in the period from early September until November 2008. Each interview was a 30-minute face-to-face interview with one exception.

The electronic questionnaire was created in terms of an AHP for trust-generating factors (see Chapter 6.1). The interview was executed in the form of a questionnaire in which the interviewees had to evaluate and compare certain trust-generating factors concerning their subjective importance. The interview was interactive. The questionnaire was presented on the interviewer's laptop.

The interview started by introducing the topic. The trust typology was presented and explained to the interviewee.

Afterwards the interviewee was asked to imagine a situation in which he was searching for a new seller and was asked to stipulate which of the trust factors are more important to him in convincing him to regard the new supplier as trustworthy. This was done in the form of a paired comparison of the factors in the typology with the help of the rating scale. Each factor of each typology level is evaluated concerning its importance in establishing a relationship with a new seller.

The results are presented at the end. Afterwards the data was saved, and the interview ended. The computer software calculates in real-time detailed information of the importance ranking for the individual companies during the interview. At the end of each interview it was possible to obtain a first impression of the interviewee's choices and priorities for trust-generating factors. Derivations of consensuses or differences between the companies of each sector have been made with a comparison among the companies' results. The results have been printed out and arranged on a flip chart to get a first impression of potential consensuses and differences.

Furthermore, the five most important trust-generating factors on relative percentage basis are selected for each enterprise. Afterwards the relative frequency of these factors is determined for each sector. The results are presented and discussed in the next subchapters. First the situation in the German agri-food sectors is provided per enterprise in every sector. Second, the picture of the five European (Austria, Italy, Greece, Spain and Slovenia) and three cross-border (Brazil, USA and Turkey) countries is shown. The findings can only be used as indications due to the limited number of conducted interviews.

6.2 The case of German agri-food enterprises

This section provides the results and the discussion of the analysis of the importance of trust-generating factors in German food importers' B2B transactions. Findings are collected according to the following agri-food chains:

- Cereal sector;
- Meat sector;
- Fruit and vegetable sector.

In Annex 3 an overview of the relevant quantitative information about all the interviewed companies will be given; results are presented below, in the appropriate section. The percentage distribution of the objects of trust (product, seller, market environment) and a selection of the **five** most important trust-generating factors of level two and three of the trust typology are shown in relative percentage for each enterprise. Afterwards the results are summed up for each sector.

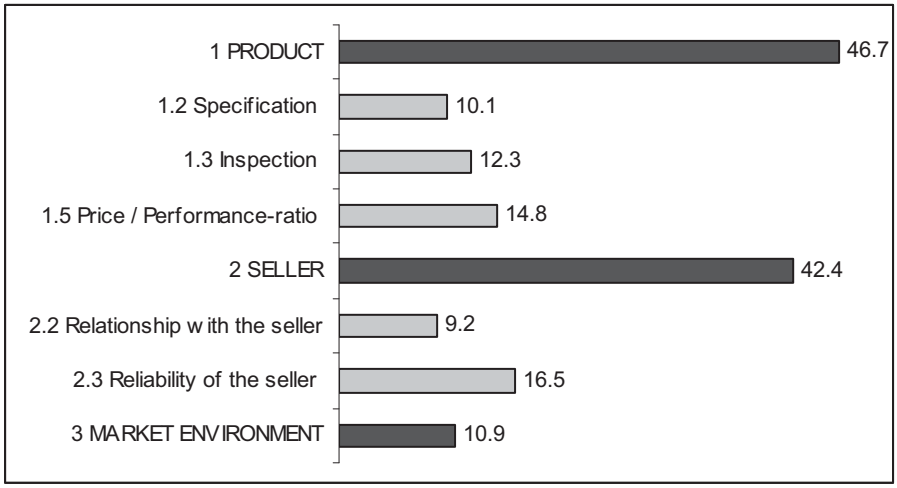
6.2.1 Cereal sector

This subchapter provides the main results of the cereal-sector analysis. Five German cereal-importing companies with different core specializations of production have been interviewed to evaluate their importance of trust-generating factors regarding their first transaction with a new foreign supplier of cereal and cereal products.
The Annex 3 shows qualitative information determined on an individual basis about the cereal-importing companies: it points out the characteristics of the different companies.

The case of enterprise Cereal 1

Figure 6-7 provides the five key results of cereal-importing enterprise 1: On the right-hand side the first level is evaluated, and on the left-hand the second and third of the trust typology are evaluated.

Figure 6-7: Key results of enterprise Cereal 1 in relative percent [%]



Source: Own elaboration

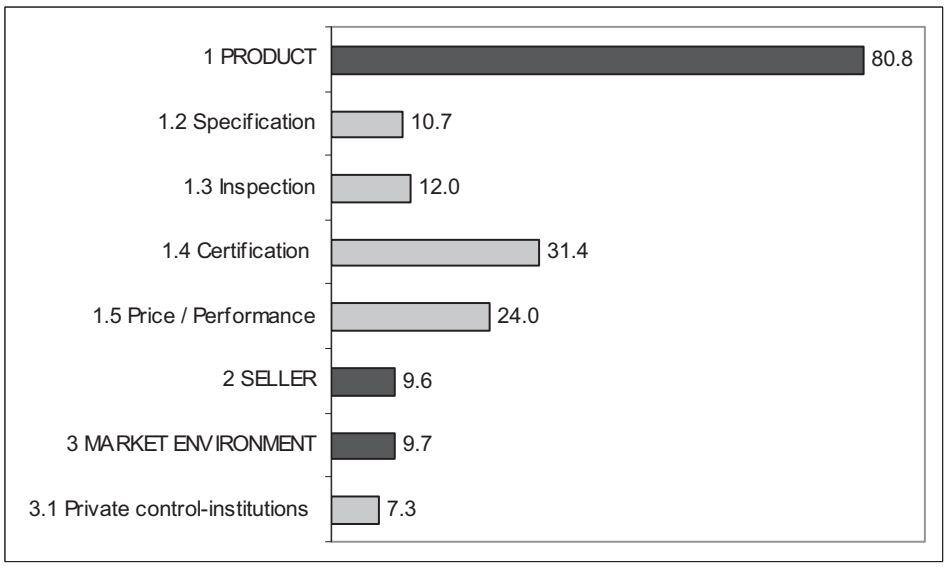
According to the first level of the trust typology the "product" is of highest importance (46.7%) closely followed by the factor "seller" (42%). The market environment is of lowest importance at 10.9%.

On levels two and three the five most important trust factors of cereal-importing enterprise Cereal 1 in relative percentage were selected. The interview evaluates that the factors "reliability of the seller (enterprise)" (16.5%) and "price / performance ratio" of the product" (14.8%) are of prime importance for this enterprise. The factor "inspection of the product" (12.3%) follows closely behind. In fourth and fifth place are "specification of the product" (10.1%) and "relationship with the seller" (9.2%), respectively.

The case of enterprise Cereal 2

Quite different results are seen in enterprise Cereal 2. Figure 6-8 provides the key results of cereal-importing enterprise 2.

Figure 6-8: Key results of enterprise Cereal 2 in relative percent [%]



Source: Own elaboration

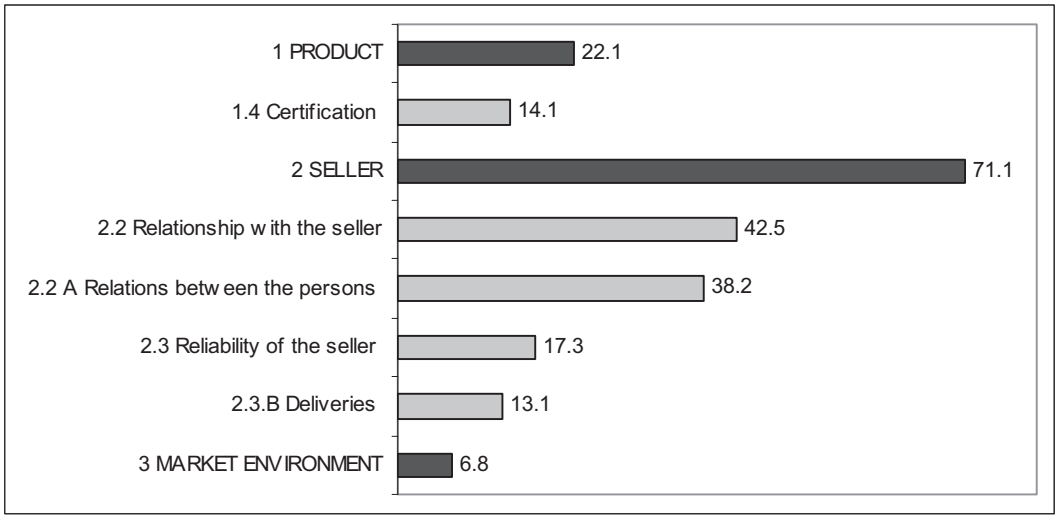
On the first level of the trust typology the factor "product" is obviously of highest importance. The factors "market environment" (9.7%) and "seller" (9.6%) are of nearly the same low level of importance.

With reference to level two and three the figure shows the five most important trust factors for enterprise Cereal 2. In first place the factor "certification of the product" (31.4%) is evaluated to be the most important trust-generating factor for this enterprise followed by "price / performance-ratio" with 24%. The "inspection of the product" (12%) and "specification of the product" (10.7%) are also of particular importance. In fifth place is the factor "private control institutions" with 7.3%.

The case of enterprise Cereal 3

The situation in enterprise 3 is shown in Figure 6-9.

Figure 6-9: Key results of enterprise Cereal 3 in relative percent [%]



Source: Own elaboration

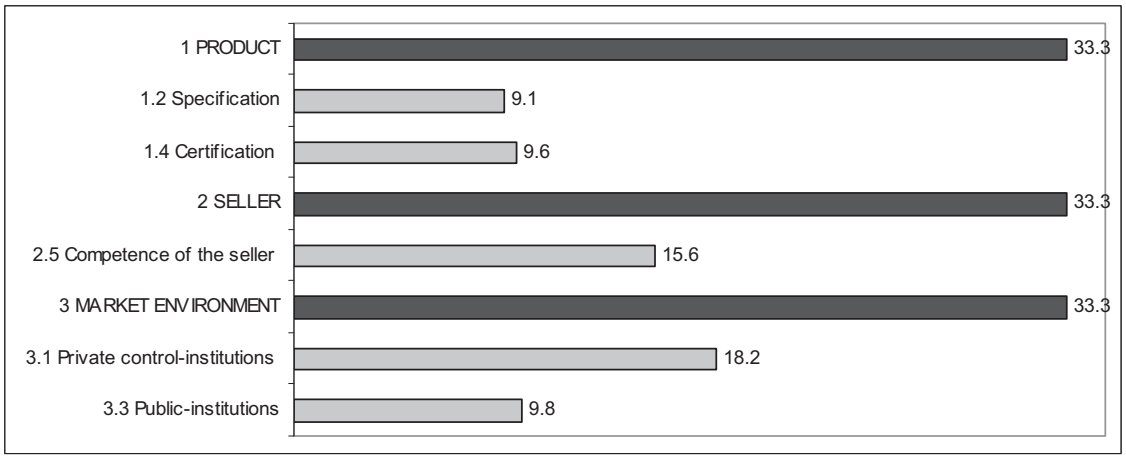
On the first level of the trust typology the factor "seller" is of highest importance for this enterprise with 71.1%. In second place comes the factor "product" (22.1%) and last the "market environment" (6.8%).

In regards to level two and three the five most important trust factors for enterprise Cereal 3 are as follows: in first place the factor "relationship with the seller (enterprise)" with 42.5%, followed by the "relations between the persons" (38.2%). The next three are the factors "reliability of the seller (enterprise)"17.3%, "certification of the product" (14.1%) and "deliveries" with 13.1%.

The case of enterprise Cereal 4

The key results of cereal importing enterprise Cereal 4 are presented in Figure 6-10 below.

Figure 6-10: Key results of enterprise Cereal 4 in relative percent [%]



Source: Own elaboration

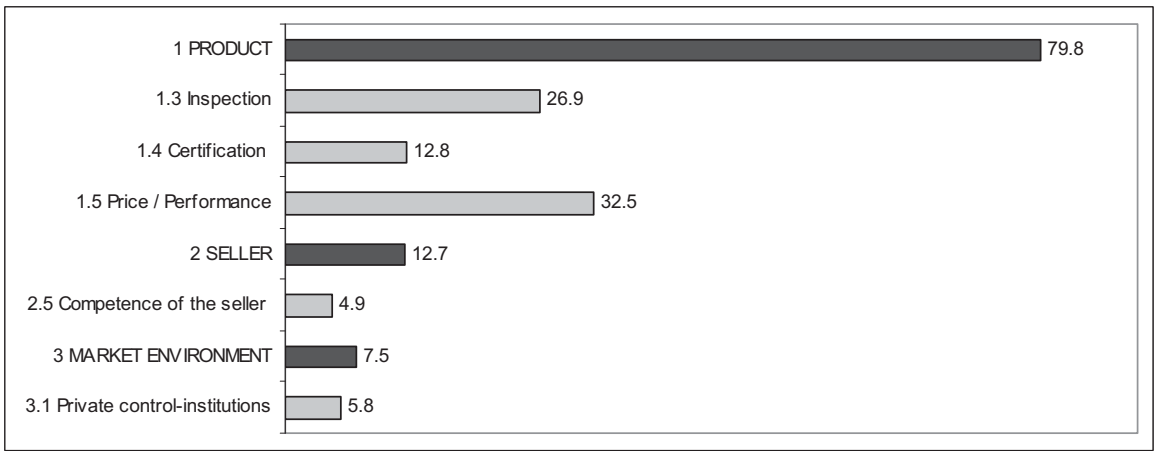
With reference to the first level of the typology all objects of trust are evaluated to be of equal importance (33.3%).

Concerning the second and third level Figure 6-10 shows the five most important factors for enterprise Cereal 4. Of prime importance for this enterprise is the factor "private control institutions" (18.2%). The factor "capability of the selling enterprise" (15.6%) comes second. The factors "public legal institutions" with 9.8%, "certification of the product" with 9.6% and "specification of the product" with 9.1% follow. It is remarkable that there is only a small difference between the last three factors.

The case of enterprise Cereal 5

The results of enterprise Cereal 5 are presented in Figure 6-11**.**

Figure 6-11: Key results of enterprise Cereal 5 in relative percent [%]



Source: Own elaboration

Concerning the first level of the typology the "product" is obviously of highest importance with 79.8% in contrast to the factors "seller" (12.7%) and "market environment" (7.5%).

Figure 6-11 also provides the five most important factors for enterprise 5. The factor "price / performance ratio of the product" (32.5%) is the most important trust-generating factor in B2B

transactions. In second place comes the factor "inspection of the product" (26.9%). In the last three places come "certification of the product" (12.8%), "private inspection institutions" (5.8%) and "capability of the selling enterprise" (4.9%) which are evaluated to be of higher importance than other factors.

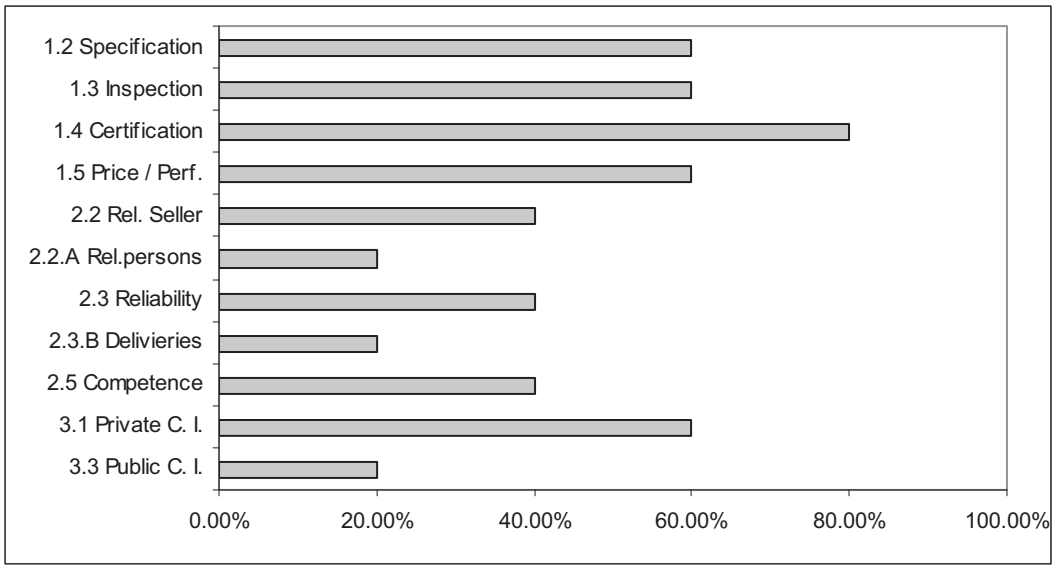
Summary cereal sector

In regards to the presented figures the relative frequency out of the five most important factors for each cereal-importing enterprise can be determined for the second and third level of the hierarchy (see Figure 6-12).

The factor which is most often in the top five of the most important trust-generating factors has the highest frequency and so on.

In the cereal sector 80% of the interviewed companies find "certification of the product" as one of the five most important trust-generating factors. "Private control institutions (private C.I.)", "specification of the product", "inspection" and "price/performance ratio" are relevant to about 60% of the companies. The factors "relationship with the seller", "reliability of the seller" and "capability of the selling enterprise" are of particular importance for about 40% of the interviewed companies. For only 10% "deliveries" and "relations between individuals" carry a special meaning.

Figure 6-12: Relative frequency in percent [%] of the most important factors for German cereal-importing companies



Source: Own elaboration

Rather insignificant factors for all interviewed cereal-importing companies are factors like "reputation of the product", "reputation of the seller", "competence (of the seller) to solve problems", and "informal institutions" seems to be of the lowest importance.

6.2.2 Meat sector

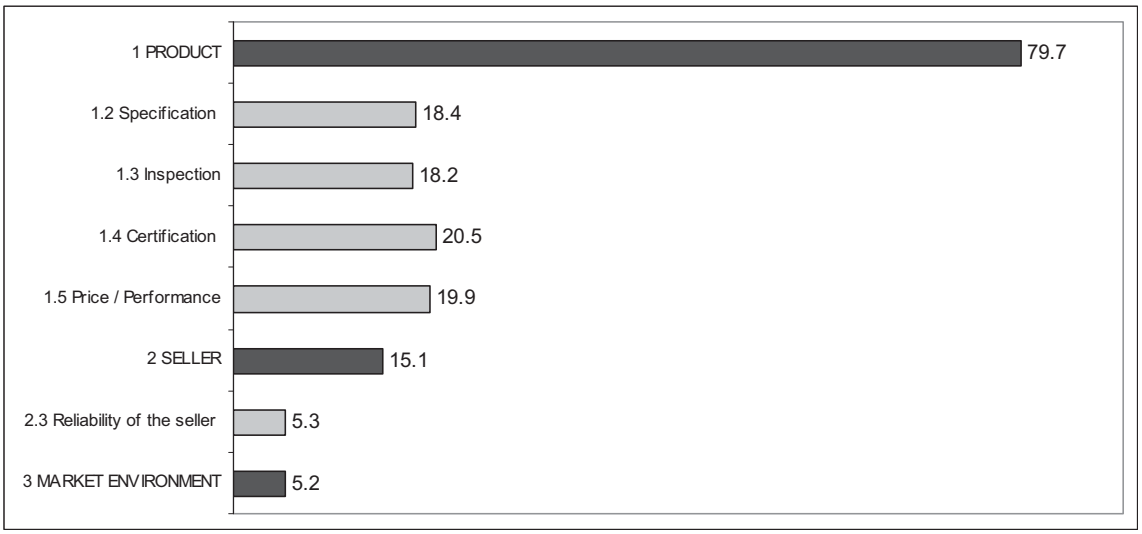
Six meat-importing companies have been asked to evaluate their importance of trust-generating factors in their supplier relationships. An overview of information about the enterprises is

provided in Annex 3. Following are the results of the importance in relative percentage for the first level as well as the five most important trust factors of the second and third level of the trust typology for each meat-importing enterprise.

The case of enterprise Meat 1

Figure 6-13 provides the key results of meat-importing enterprise Meat 1.

Figure 6-13: Key results of enterprise Meat 1 in relative percent [%]



Source: Own elaboration

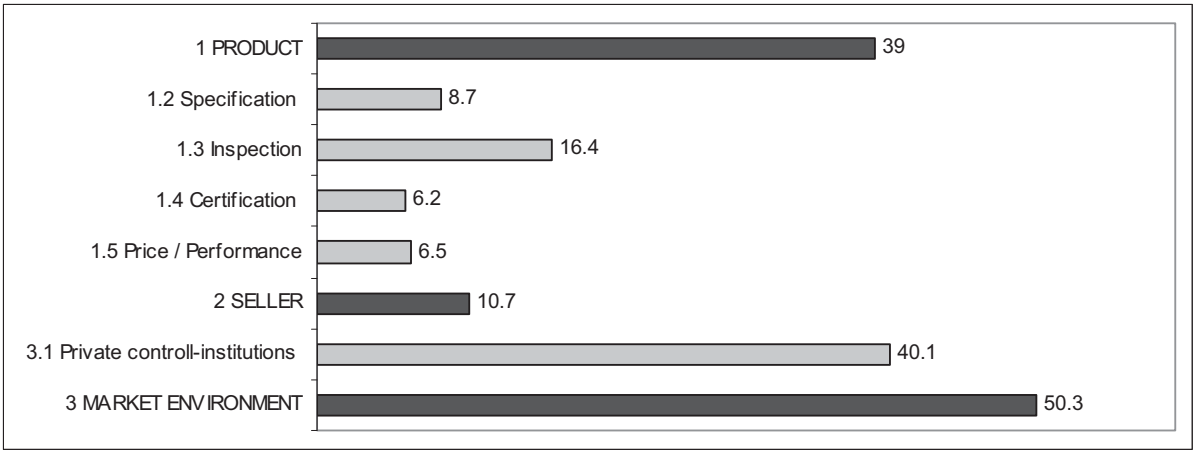
On the first level of the trust typology the object of trust "product" is of considerably high importance with nearly 80%. The factor "seller" follows at a huge distance (15.1%). The "market environment" is of minor importance.

In Figure 6-13 the five most important trust-generating factors concerning the second and third level of the typology for enterprise Meat 1 are also presented. It is worth mentioning that the first four factors are more or less equal in their relative importance percentage. "Certification of the product" (20.5%), "price / performance ratio" (19.9%), "specification of the product" (18.4%) and the factor "inspection of the product" are all evaluated with about 20%. The last factor "reliability of the seller (enterprise)" (5.3%) follows at a huge distance in the importance of trust-generating factors for this enterprise.

***The case of enterprise** Meat 2*

Figure 6-14 provides the key results of meat-importing enterprise Meat 2.

Figure 6-14: Key results of enterprise Meat 2 in relative percent [%]



Source: Own elaboration

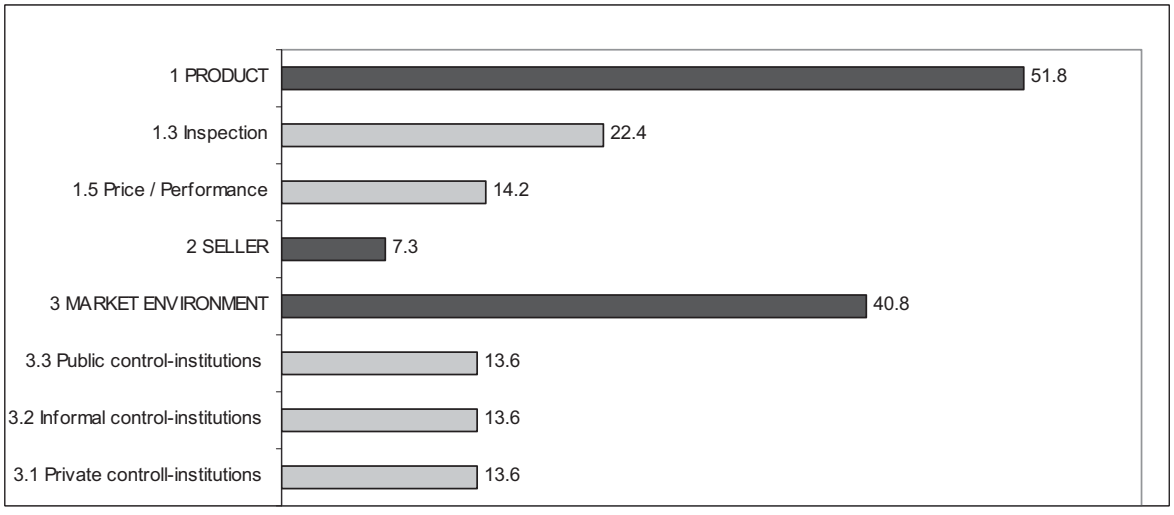
On the first level of the typology the factor "market environment" is of prime importance with 50.3 %. In second place follows the "product" (39.0%) and in third the "seller" is of lowest importance.

Concerning the second and third level Figure 6-14 shows the five most important trust factors for enterprise Meat 2. In first place comes the factor "private control institutions". This factor is of prime importance with around 40%. Second comes the factor "inspection of the product" (16.4%) as being highly relevant. The factors "specification of the product" (8.7%), "price / performance ratio" (6.5%) and "certification of the product" (6.2%) are also factors of more particular importance for this enterprise.

The case of enterprise Meat 3

Figure 6-15 provides the key results of meat-importing enterprise Meat 3.

Figure 6-15: Key results of enterprise Meat 3 in relative percent [%]



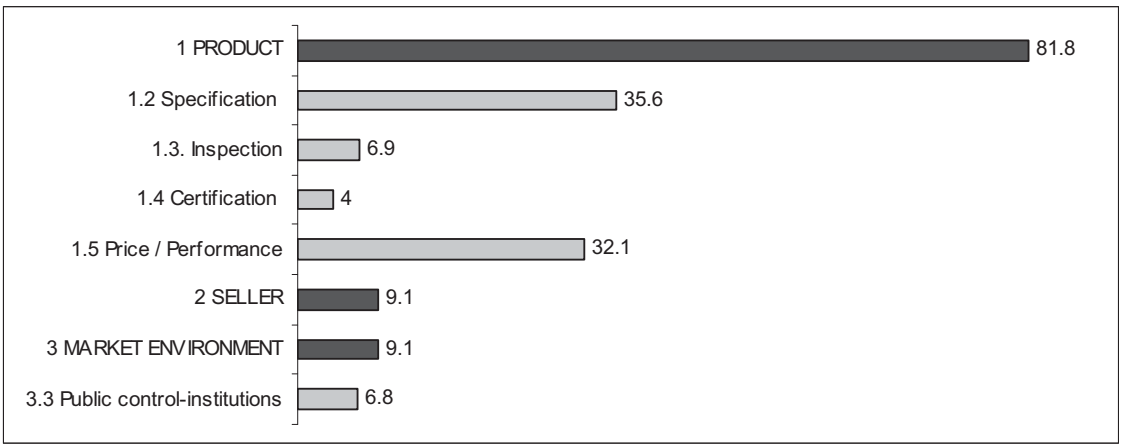
Source: Own elaboration

Concerning the first level of the trust typology the factor "product" is evaluated to be of highest importance with about 52%, followed closely by the factor "market environment" (40.8%). The factor "seller" is obviously of very low importance for this enterprise.
In Figure 6-15 the five most important trust factors of the second and third level are shown as well. With a little distance ahead of the others the trust factor "inspection of the product" (22.4%) is of prime importance for this enterprise. The other factors "price / performance ratio" (14.2%), "private control institutions" (13.6%), "informal inspection institutions" (13.6%) and "public legal institutions" (13.6%) all have about 13-14% of importance for the enterprise. Thus they have nearly the same importance.

The case of enterprise Meat 4

Figure 6-16 provides the key results of meat-importing enterprise Meat 4.

Figure 6-16: Key results of enterprise Meat 4 in relative percent [%]



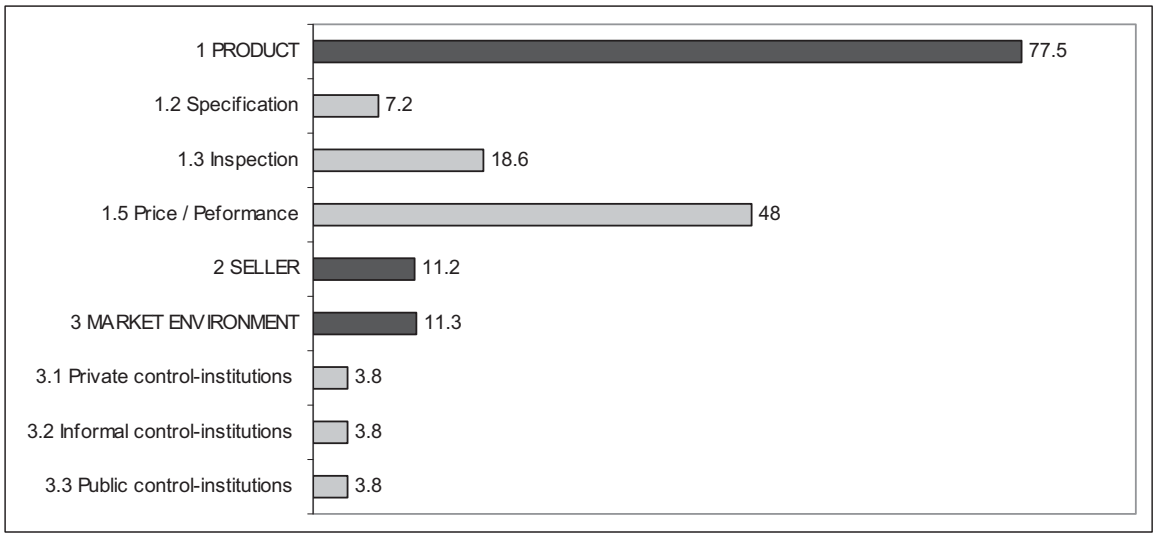
Source: Own elaboration

It is obvious that the factor "product" with more than 80% is of highest importance for this enterprise. The factors "seller" and "market environment" are of equal importance with both being around 9%.
On levels two and three of the trust typology the trust-generating factors "specification of the product" (35.6%) and "price / performance ratio" (32.1%) are evaluated to be of prime importance for the enterprise. After a huge distance the three last trust factors of the five most important follow: "inspection of the product" (6.9%), "public legal institutions" (6.8%) and "certification of the product" with 4%.

The case of enterprise Meat 5

Figure 6-17 provides the key results of meat-importing enterprise Meat 5.

Figure 6-17: Key results of enterprise Meat 5 in relative percent [%]



Source: Own elaboration

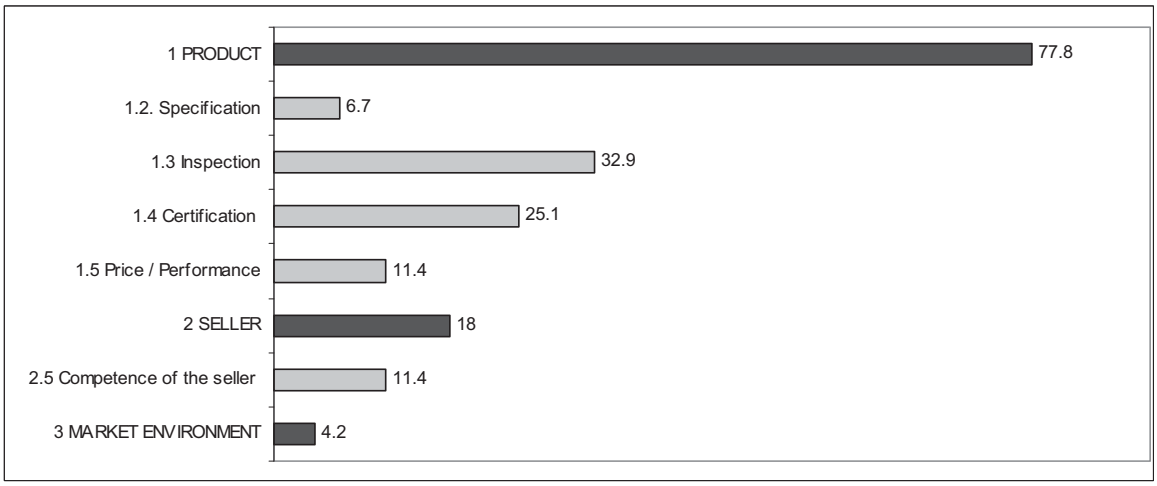
On the first level of the trust typology the factor "product" (77.5%) is of highest relevance for trust generation in a new seller. The factors "seller" and "market environment" are evidently of lesser importance for this enterprise with both about 11.2%.

Figure 6-17 also shows the six most important trust factors for enterprise Meat 5. In this case it is necessary to show six factors, as the last three were evaluated with the same relative percentage. What is quite certain is that the most important factor of all is "price / performance ratio" with 48%. Secondly "inspection of the product" with 18.6% follows. The trust factor "specification of the product" (7.2%) is third most important for this enterprise. The last three factors "private informal and public legal institutions" are at the bottom with 3.8%.

The case of enterprise Meat 6

Figure 6-18 provides the key results of meat-importing enterprise Meat 6.

Figure 6-18: Key results of enterprise Meat 6 in relative percent [%]



Source: Own elaboration

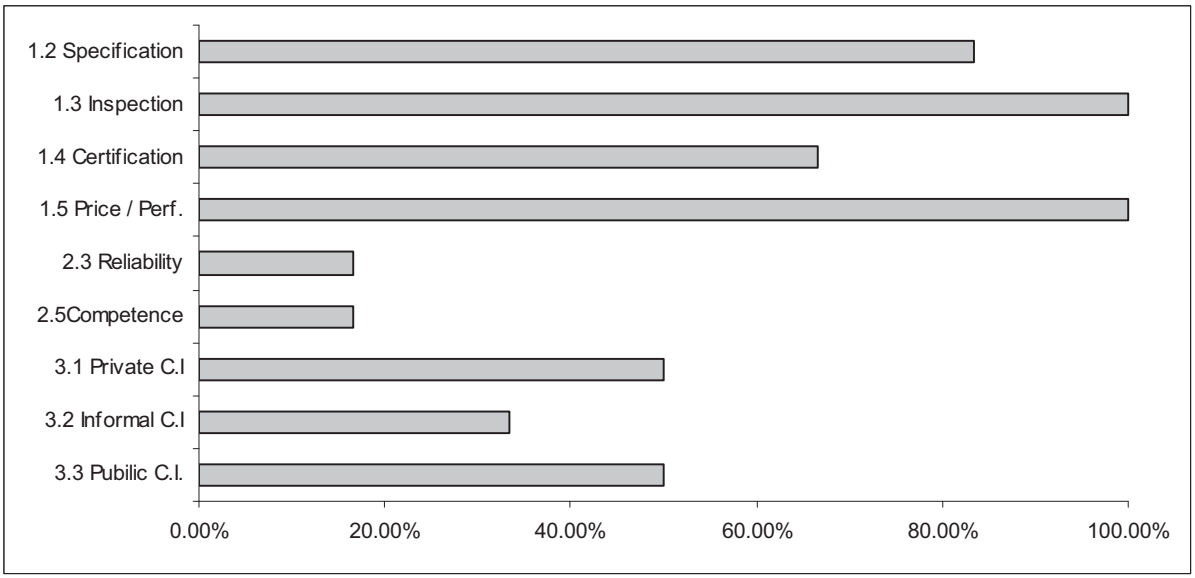
Obviously the factor "product" is of prime importance for this enterprise with around 78%. In second place follows the factor "seller" with 18%. The "market environment" is of less relevance with only 4.2%.

In regards to the second and third level of the trust typology the five most important trust factors for enterprise Meat 6 are shown. The factor "inspection of the product" (32.9%) is evaluated to be of prime importance for this enterprise. Secondly "certification of the product" (25.1%) follows. The factors "price / performance ratio" (11.4%) and "capability of the selling enterprise" (11.4%) come next. They are of equal importance. In last place the "specification of the product" is of least importance with 6.7%.

Summary meat sector

To give an overview of the most important trust-generating factors in B2B transactions for the meat sector, all chosen factors have been evaluated regarding their relative frequency. An overview is provided in Figure 6-19.

Figure 6-19: Relative frequency of the most important factors for German meat-importing companies



Source: Own elaboration

All companies in the meat sector decided concordantly that the factors "inspection of the product" and "price / performance ratio" are within their five most important factors. Secondly "specification of the product" is of particular importance at about 83%, closely followed by "certification of the product" with about 67%. Half (50%) of the interviewed companies regard "public and private inspection institutions" as important trust-generating factors. On the other hand, "informal inspection institutions" are mentioned by about 33% of the companies. The factors "capability of the selling enterprise" and reliability are of less importance for most of the companies; only about 17% chose it as one of their five most important factors.

On the first level of the hierarchy, the product is of prime importance for the meat sector. The importance percentage is about 67.9% on average. The factor "market environment" comes second with an importance of about 20.5% on average. In third place is the factor "seller" with about 11.9% importance percentage.

The trust-generating factors "reputation of the product", "relationship with the seller", "reputation of the seller" as well as "competence (of the seller) to solve problems" are of minor importance for the selected German meat-importing companies.

6.2.3 Fruit and vegetable sector

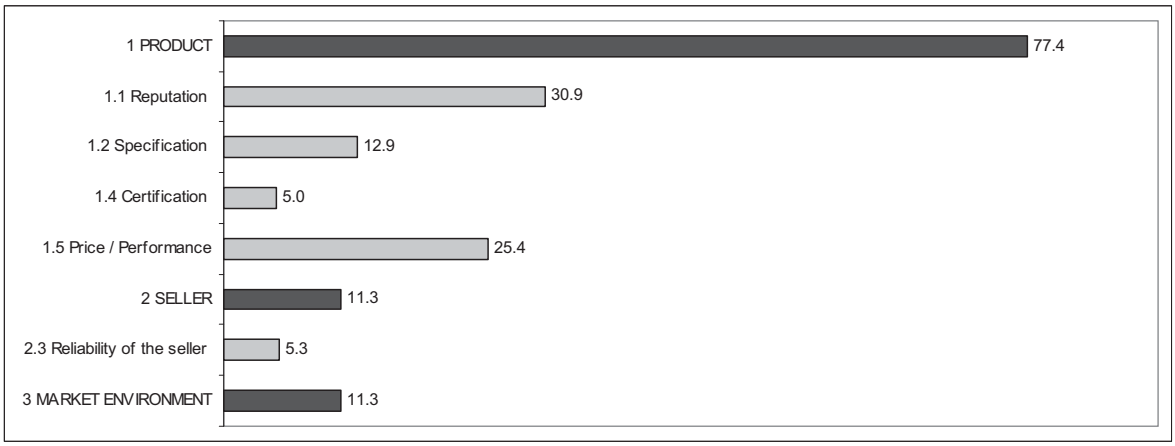
In the fruit and vegetable sector seven companies have been asked to evaluate their importance of trust-generating factors in their supplier relationships. Annex 3 shows an overview of the queried enterprises.

The following figures point out the importance in relative percentage for the first level of the trust typology as well as the five most important trust factors of the second and third level of the trust typology evaluated through the AHP interview for each enterprise.

The case of enterprise Fruits and Vegetables 1

Figure 6-20 provides the key results of fruit-and-vegetable-importing enterprise Fruits and Vegetables 1

Figure 6-20: Key results of enterprise Fruits and Vegetables 1 in relative percent [%]



Source: Own elaboration

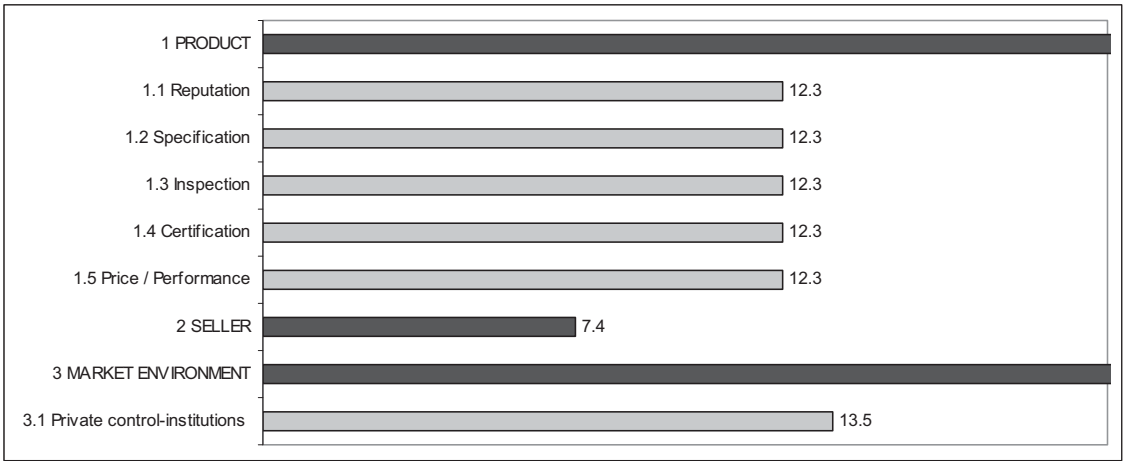
On the first level of the trust typology the factor "product" is obviously of highest relevance (77.4%). The factors "market environment" and "seller" are of equal importance (11.3%).

With regards to level two and three Figure 6-20 shows the five most important factors for enterprise Fruits and Vegetables 1. The factor "reputation of the product" (30.9%) is the most important trust factor for this enterprise. Second is "price / performance ratio" with 25.4%. The trust factors "specification of the product" (12.9%), "reliability of the seller" (5.3%) and "certification" (5%) are also of particular importance.

The case of enterprise Fruits and Vegetables 2

Figure 6-21 provides the key results of fruit-and-vegetable-importing enterprise Fruits and Vegetables 2.

Figure 6-21: Key results of enterprise Fruits and Vegetables 2 in relative percent [%]



Source: Own elaboration

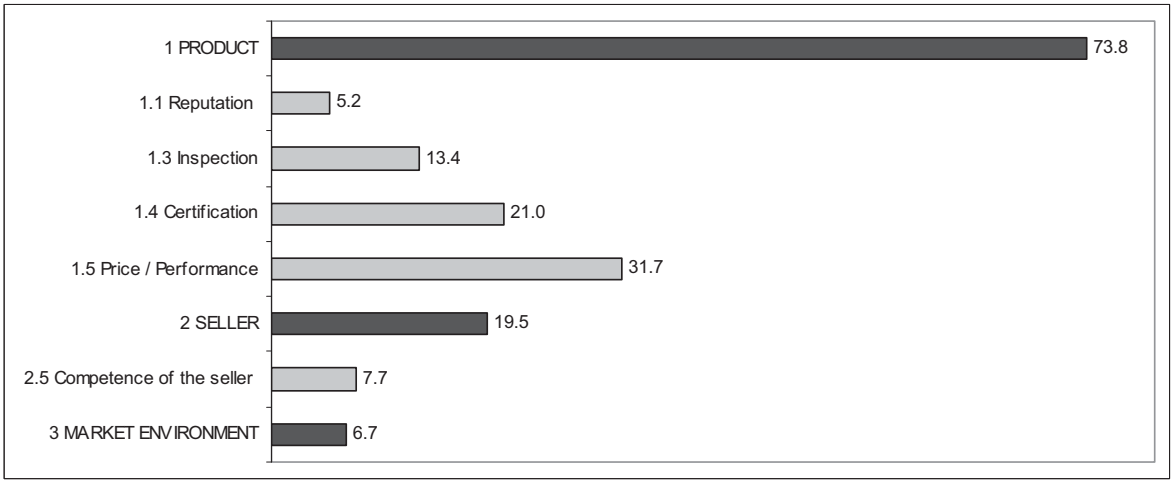
On the first level of the typology the factor "product" is of the highest relevance (61.5%). In second place comes the factor "market environment" (31.0%). Of lowest importance is the factor "seller" with 7.4%.

For the second and third level Figure 6-21 shows the six most important factors, because the following five factors have been evaluated with the same relative percentage. The trust factor "private control institutions" is at the top of the list with 13.5% for this enterprise. The other factors follow very closely behind with a percentage of each 12.3%. These trust factors are "reputation of the product", "specification of the product", "inspection", "certification of the product" and "price / performance ratio". All factors are evaluated to be of nearly equal importance.

The case of enterprise Fruits and Vegetables 3

Figure 6-22 provides the key results of fruit-and-vegetable-importing enterprise Fruits and Vegetables 3.

Figure 6-22: Key results of enterprise Fruits and Vegetables 3 in relative percent [%]



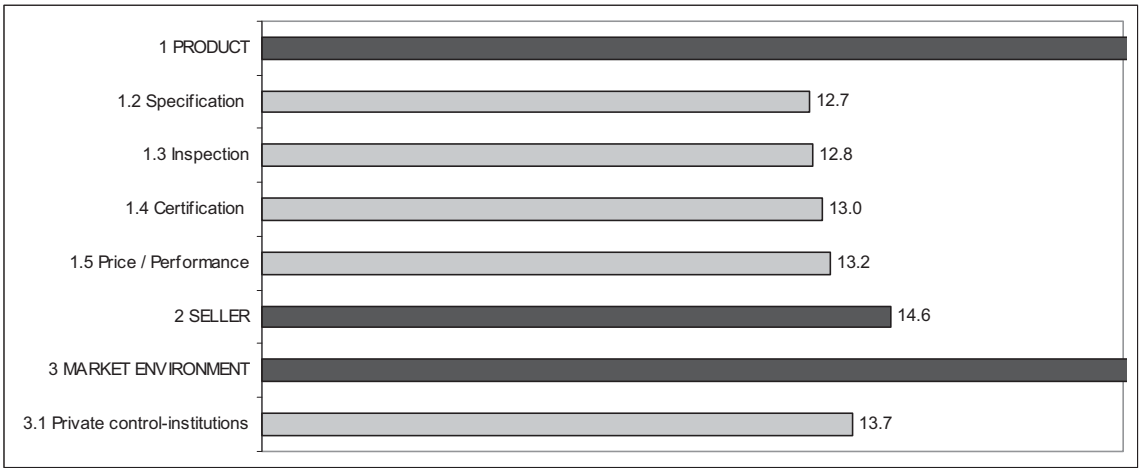
Source: Own elaboration

On the first level of the typology the factor "product" is evaluated to be of the highest importance. The factor "seller" follows with 19.5%. In last place the "market environment" is evaluated to be of lowest importance (6.7%).
Concerning level two and three Figure 6-22 provides the most important factors for enterprise Fruits and Vegetables 3. The trust factor "price / performance" is at the top with 31.7%. Second comes the factor "certification of the product" (21%). The trust factor "inspection of the product" with 13.4% follows. In places four and five come the factors "capability of the selling enterprise" (7.7%) and "reputation of the product" (5.2%), respectively.

The case of enterprise Fruits and Vegetables 4

Figure 6-23 provides the key results of fruits and vegetables importing enterprise Fruits and Vegetables 4.

Figure 6-23: Key results of enterprise Fruits and Vegetables 4 in relative percent [%]



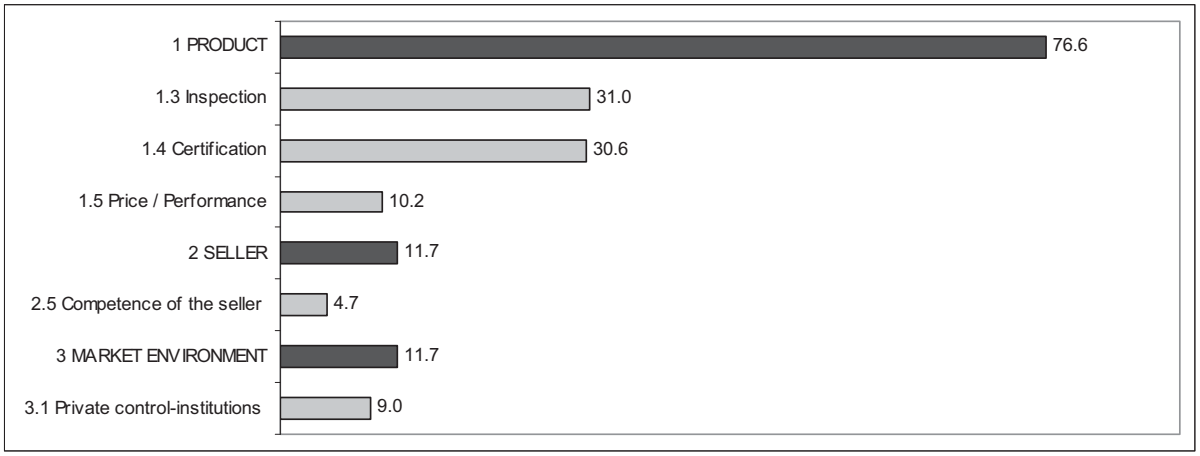
Source: Own elaboration

On the first level of the trust typology the factor "product" is of highest importance with 56.6%. In second place is the factor "market environment" (28.8%) and in last place comes the factor "seller" with 14.6%.
For the second and third level Figure 6-23 shows the five most important trust-generating factors. It is remarkable that all the five factors have nearly the same percentage. Consequently the importance of the factors for trust generation is nearly the same. For this enterprise the factor "private control institutions" (13.7%) followed very closely by the two factors "price / performance ratio" (13.2%) and "certification of the product" (13%) are of high importance, closely followed by "inspection of the product" (12.8%) and "specification" (12.7%).

The case of enterprise Fruits and Vegetables 5

Figure 6-24 provides the key results of fruit-and-vegetable-importing enterprise Fruits and Vegetables 5.

Figure 6-24: Key results of enterprise Fruits and Vegetables 5 in relative percent [%]



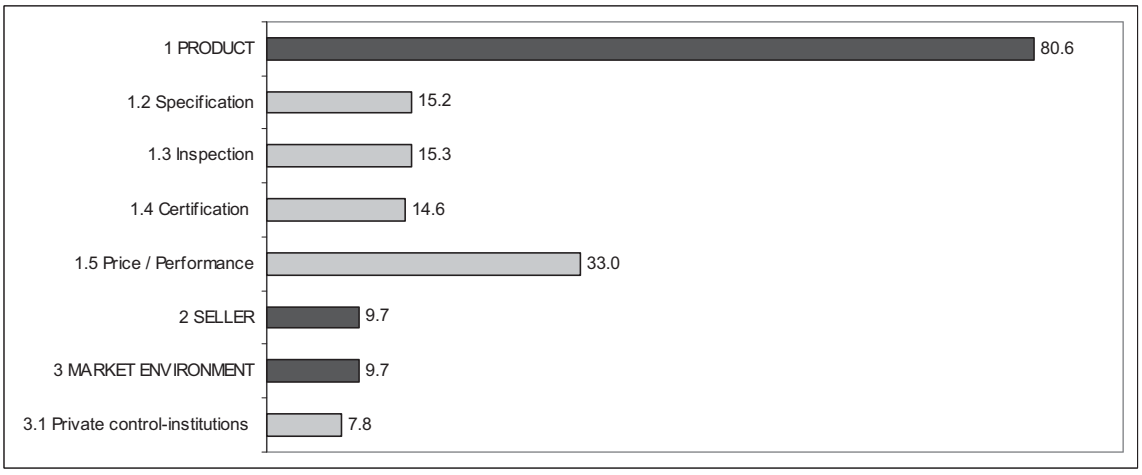
Source: Own elaboration

The factor "product" (76.6%) is at the top of the list on the first level of the trust typology. The factors "seller" and "market environment" are of equal importance with only 11.7%.
Figure 6-24 also shows the five most important trust-generating factors for the second and third level of the typology. The factors "inspection of the product" with 31% and "certification of the product" with 30.6% are at the top of the list for this enterprise. In third place is the factor "price / performance ratio" (10.2%), followed closely by "private control institutions" with 9%. The "capability of the selling enterprise" with 4.7% is also of particular importance in contrast to the other factors with an even lower percentage.

The case of enterprise Fruits and Vegetables 6

Figure 6-25 provides the key results of fruit-and-vegetable-importing enterprise Fruits and Vegetables 6.

Figure 6-25: Key results of enterprise Fruits and Vegetables 6 in relative percent [%]



Source: Own elaboration

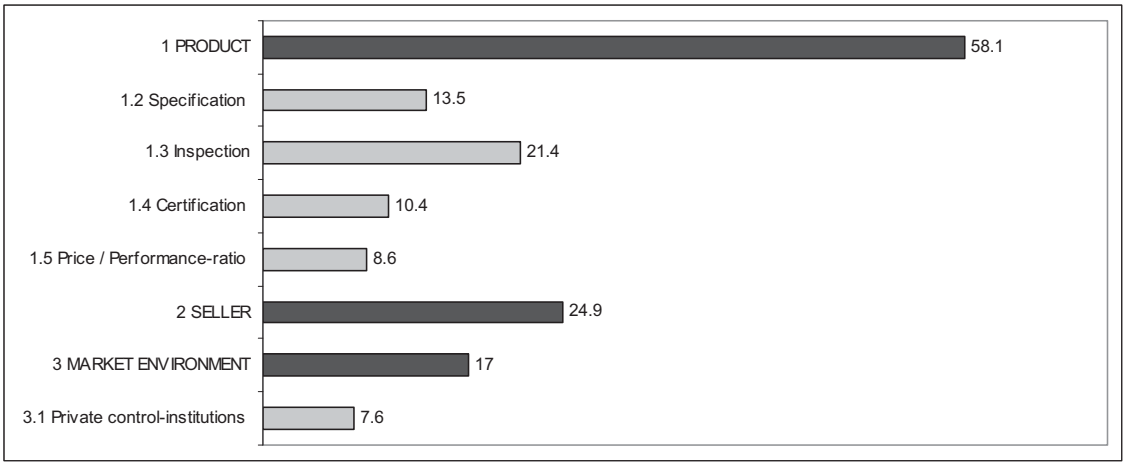
On the first level of the typology the factor "product" (80.6%) is obviously of the highest relevance as an object of trust. The factors "seller" and "market environment" are of lower importance, both with 9.7%.

Figure 6-25 also shows the five most important trust-generating factors for enterprise Fruits and Vegetables 6. The trust factor "price / performance ratio" (33%) is of prime importance for this enterprise. Second are the factors "inspection of the product" (15.3%), "specification of the product" (15.2%) and "certification of the product" (14.6%). With 7.8% "private control institutions" is the last of the five important factors.

The case of enterprise Fruits and Vegetables 7

Figure 6-26 provides the key results of fruit-and-vegetable-importing enterprise Fruits and Vegetables 7.

Figure 6-26: Key results of enterprise Fruits and Vegetables 7 in relative percent [%]



Source: Own elaboration

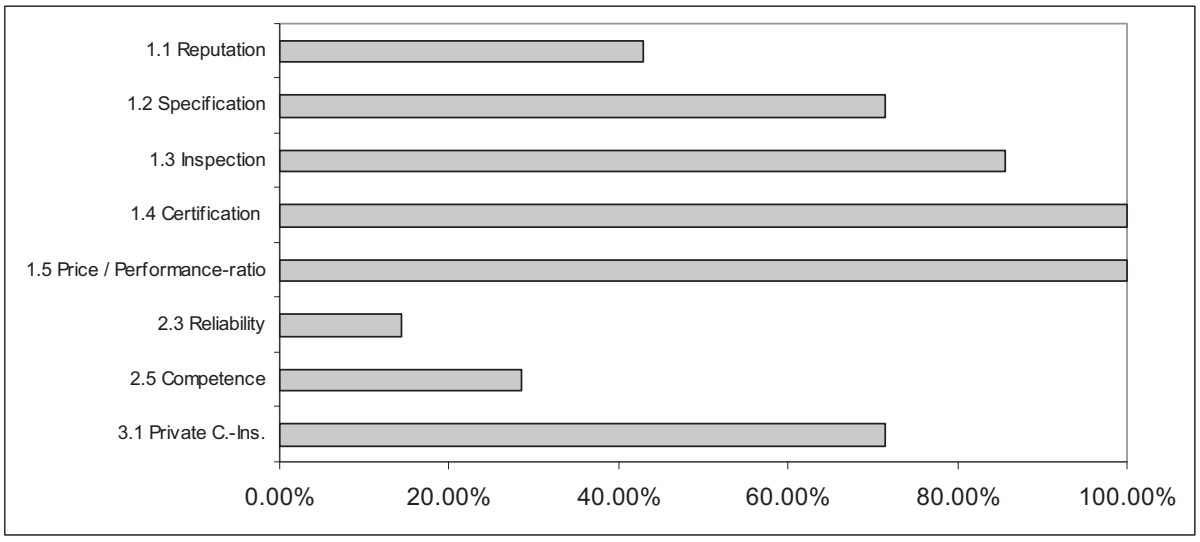
On the first level of the trust typology the factor "product" is of particular importance for this enterprise with 58.1%. In second place follows the factor "seller" with 24.9%. Of lower importance is the factor "market environment" with 17%.

With regards to the second and the third level, the trust-generating factor "inspection of the product" (21.4%) is of prime importance. Second, "specification of the product" (13.5%) is of particular importance. The factors "certification of the product" (10.4%), "price / performance ratio" (8.6%) and "private control institutions" (7.6%) are following.

Summary fruit and vegetable sector

To give an overview of the most important trust-generating factors in the fruit and vegetable sector for the second level of the hierarchy, all chosen factors have been evaluated regarding their relative frequency (see Figure 6-27).

Figure 6-27: Relative frequency of the most important factors for German fruit-and-vegetable-importing companies



Source: Own elaboration

All enterprises in the fruit and vegetable sector decided concordantly that the factors "certification of the product" and "price / performance of the product" are among their five most important factors. 80% find "inspection of the product" of particular importance. The factors "private control institutions" and "specification of the product" are chosen by more than the half of the interviewed companies (both about 71%). The "reputation of the product" is important for about 43% of the interviewed enterprises. The factors "capability of the selling enterprise" with about 30% and "reliability of the seller" (15%) are at the bottom and seem to be of less importance for the most of the interviewed companies.

Concerning the first level of the hierarchy the "product" is evaluated through the arithmetic average to be of prime importance for the fruit and vegetable sector with about 69% average importance. The factors "market environment" and "seller" follow by a long distance. There is only a slight difference between their percentages. The factor "market environment" comes first with 16.6%, then the factor "seller" with 14.1%.

The figure also shows that the factors concerning the seller are all of rather minor importance in this sector. Furthermore, informal institutions and public legal institutions seem to be of less importance.

Summary of the results with respect to the German agri-food enterprises

Figure 6-28 sums up the relative frequency of chosen evaluations for all interviewed companies regarding the three agri-food sectors.

The main conclusion is that the "product", which is located at the first level of the trust typology, is of prime importance in B2B relationships in the three German agri-chains meat, fruit and vegetables, and cereal. On the second level of the trust typology, in particular regarding the

dimensions of the objects of trust, the focus lies on the four factors "Price / Performance", "Certification", "Specification" and "Inspection". The reputation is of less importance in all three sectors.

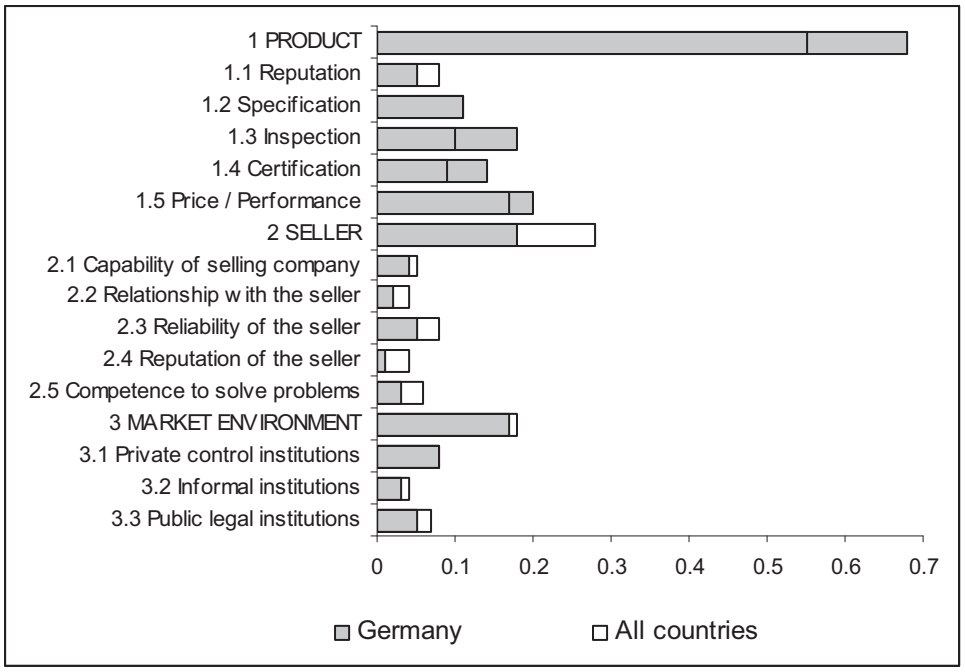
On the seller level the companies put greater emphasis on factors like capability of the selling enterprise, reliability of the seller and competence to solve problems. On the third level the deliveries play an important part.

For most of the interviewed companies the private control institutions are of particular importance regarding the market environment. In general, it can be said that all the factors dealing with personal relationships like "reputation", "relationship with the seller", "reliability of the seller" are of less importance.

Differences between wholesalers and processors

Within this analysis a distinction between wholesalers and processors has been made. In all sectors there are only small differences between wholesalers and processors. Concerning the meat sector it is uncertain if the differences between processor and wholesaler really matter. The same is valid for the fruit and vegetable sector. In the cereal sector no significant difference between wholesaler and processor can be observed.

Figure 6-28: Relative importance of trust elements in Germany



Source: Own elaboration based on Haas et al. 2009a

6.3 The case of European and cross-border agri-food enterprises as indications

6.3.1 Data collection and results in Austria

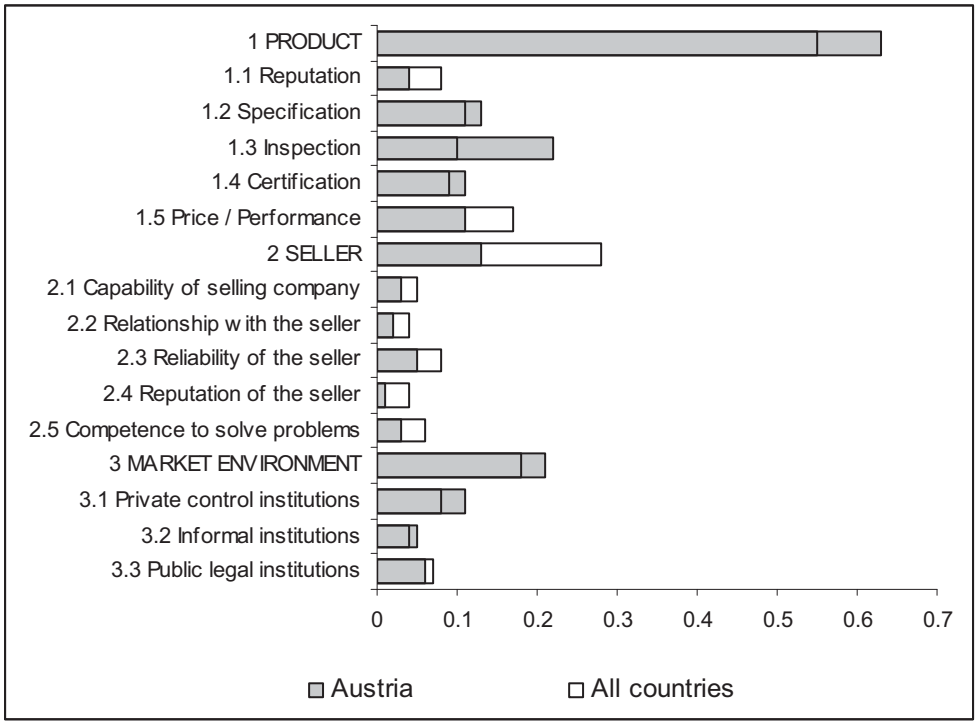
This section describes 15 assessments carried out in Austria in the period from May 2008 until February 2009. In the case of Austria, especially the following three sectors were of relevance:

- Cereal sector

- Fruit and vegetable sector
- Meat sector

Figure 6-29 shows the results of the 15 interviewed companies in the Austrian agri-food sectors. In the graph the relative importance of each factor may be compared to the overall importance (independent of the national evaluations; black line bar charts).

Figure 6-29: Relative importance of trust elements in Austria



Source: Own elaboration based on Haas et al. 2009a

Noticing this comparison, the factor "product" is far more important compared to the average importance calculated across all countries (black line). Especially "product specification" and "product inspection" are of much higher importance. The trust factor "seller" is of lesser importance for the respondents in Austria.

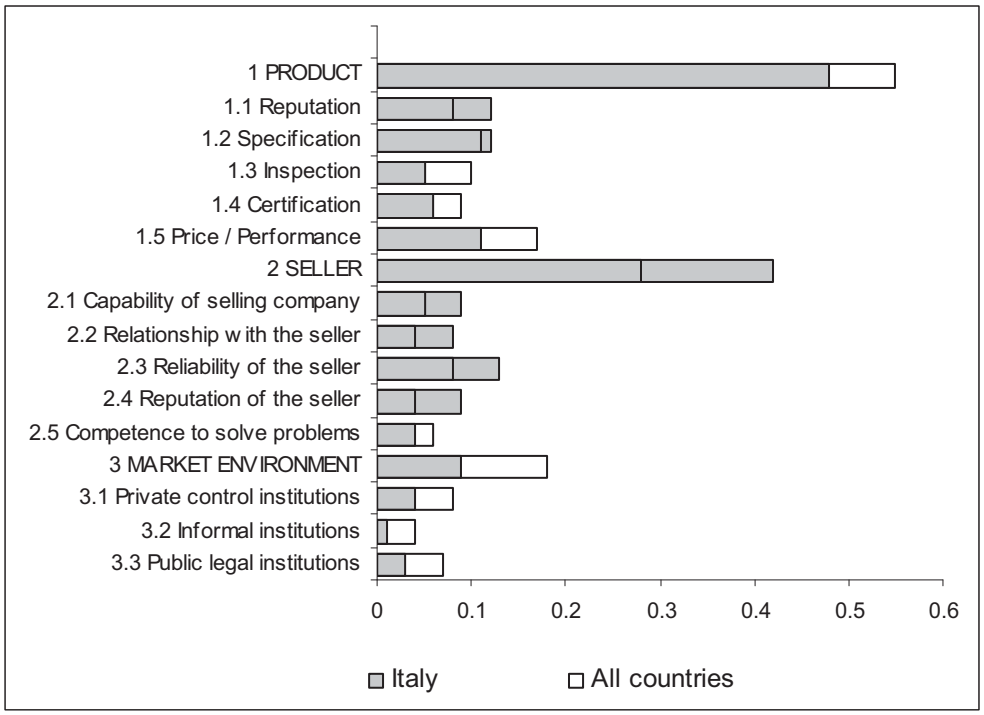
Also, "private control institutions" are of higher importance compared to the analysis in all countries. One of the reasons for this may be that a number of companies in the assessment produce for or trade mainly on the organic market, or important parts of their business are located in this sector. Private control institutions are especially important in the organic sector.

6.3.2 Data collection and results in Italy

The selection of the conducted expert interviews in Italy includes 15 relevant companies operating in the sector of meat, oil, cereals and fruit/vegetables. The results show that the dimension "product" is more important than the dimension "seller" in explaining trust in business relationships. Another very interesting cultural element derives from the analysis of the market environment factors affecting trust. People seem to trust private institutions more

than public institutions. This is a typical feature of Italian culture where public administration is often seen as a source of inefficiency and unable to provide a guarantee role (see Figure 6-30).
Summarizing, even if the item "product" is very important as a trust element, informal relations and the "human" component of business relationships still seem to play a crucial role in generating trust and in Italy transactions could be value-enhanced by encouraging network formations and contacts among people.

Figure 6-30: Relative importance of trust elements in Italy

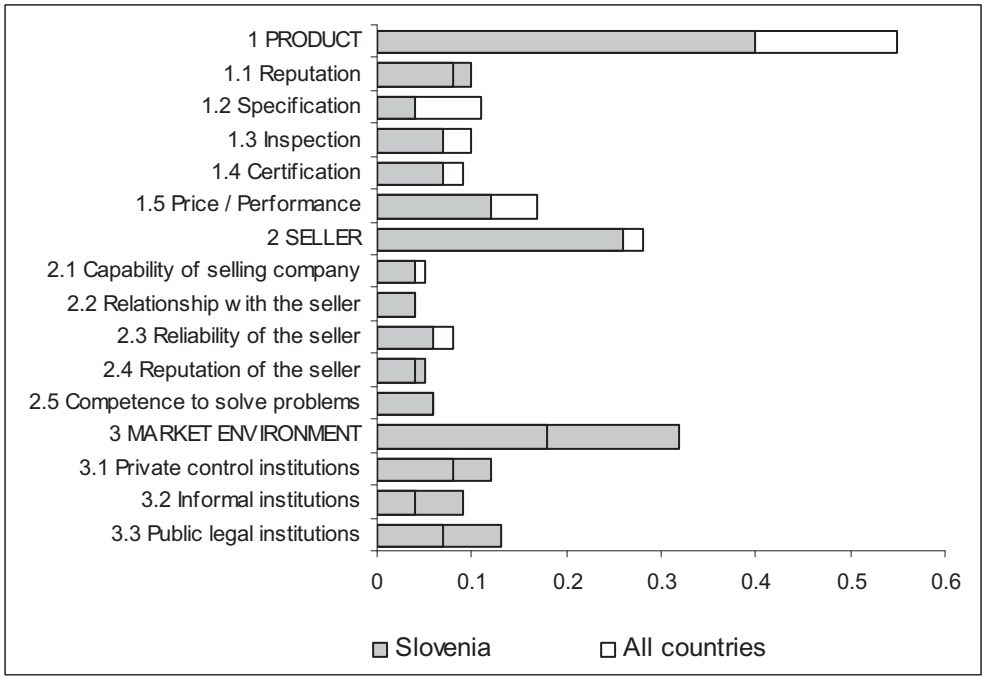


Source: Own elaboration based on Haas et al. 2009a

6.3.3 Data collection and results in Slovenia

The final selection in the Slovenian enterprises includes 22 enterprises. The Slovenian results show that the most important factors on the first level are "product", and within this trust-building-elements group the "price performance ratio" is the most esteemed item. On the second level of importance for trust building is the group of "market environment". The role of the "public legal institutions" seems to be essential. "Capability of the selling enterprise", "relationship with seller" and "reliability of the seller" are the most cited items within the seller group, which is valued in last place (see Figure 6-31).

Figure 6-31: Relative importance of trust elements in Slovenia

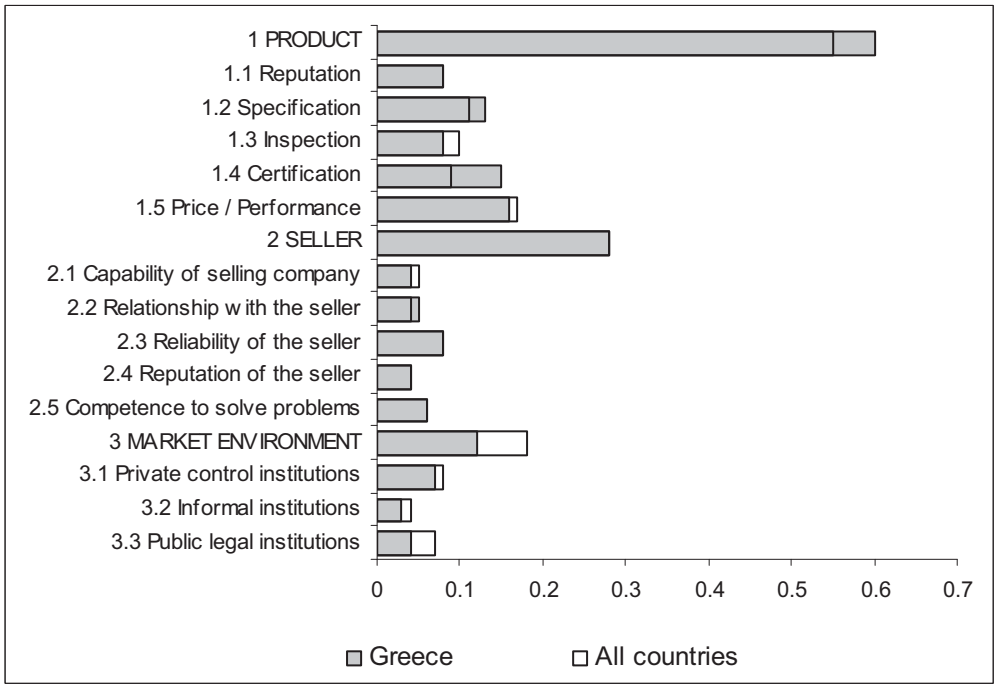


Source: Own elaboration based on Haas et al. 2009a

6.3.4 Data collection and results in Greece

In total, 10 interviews were conducted with Greek companies from all four sectors (cereals, meat, fruits and vegetables, and olive oil). Figure 6-32 shows the results of the interviews conducted in Greece.

Figure 6-32: Relative importance of trust elements in Greece



Source: Own elaboration based on Haas et al. 2009a

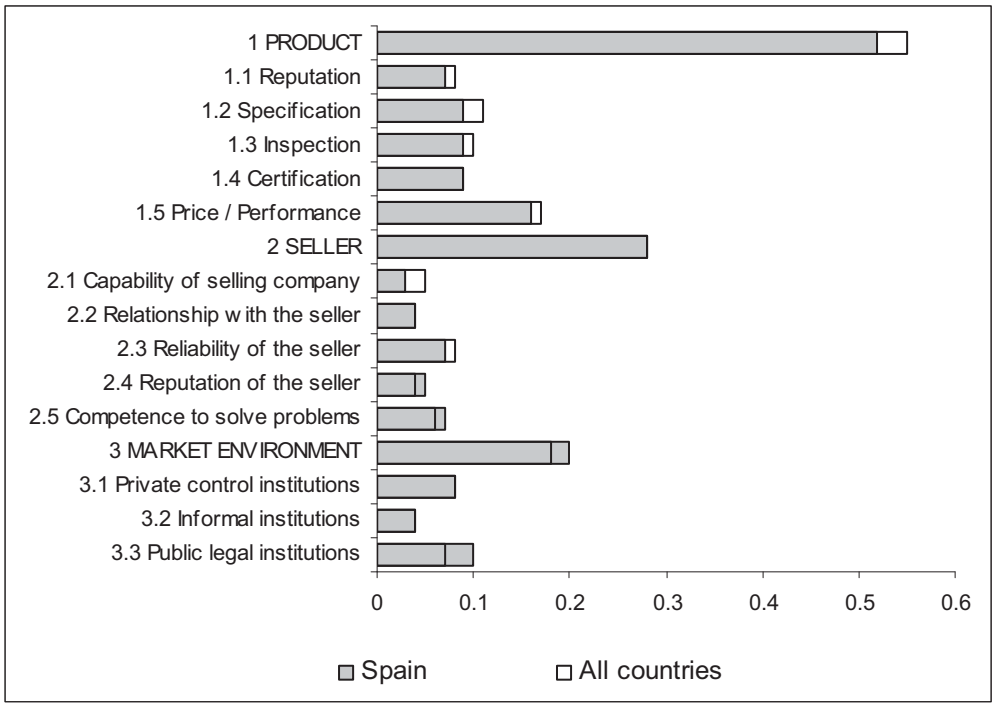
With regard to the 1st level of the typology, there is no doubt that in all sectors the item "product" receives higher importance than the "seller". In addition, the "market environment" seems to be the one with the least importance for all sectors. Concerning the 2nd level of the typology, the dimensions that seem to be more important are the "price/performance ratio", the "specification", "seller's reliability", the "relationship with the seller", and the "reliance on private control institutions". Concerning the 3rd level, the "relationship between individuals" is the most crucial source of trust, along with "communication".

As regards the differences between the processors and wholesalers, it seems that processors place more emphasis on the dimension of "specification" in contrast to wholesalers, where the dimension of "reputation" achieves greater importance. From the results, it is difficult to estimate the role of an enterprise's size in the importance placed on the various dimensions or sources of trust. This was mainly because most companies were the leaders in their sector, but even in the case of smaller companies their strong export-orientation smoothed out the potential size variations.

6.3.5 Data collection and results in Spain

The assessment of the Spanish enterprises is composed of a total of 19 interviews: 5 cereals, and fruit and vegetable sector; 4 meat sector; 3 in the olive oil sector and 2 belong to professional grower organisations. Given the outcome of the Spanish assessment of trust elements, it is arguable that the importance of the "product" as trust generator is prevailing, and in this group the "price and performance ratio" is in first place. Between the group of the seller and market environment as trust elements there is no significant difference. (see Figure 6-33)

Figure 6-33: Relative importance of trust elements in Spain



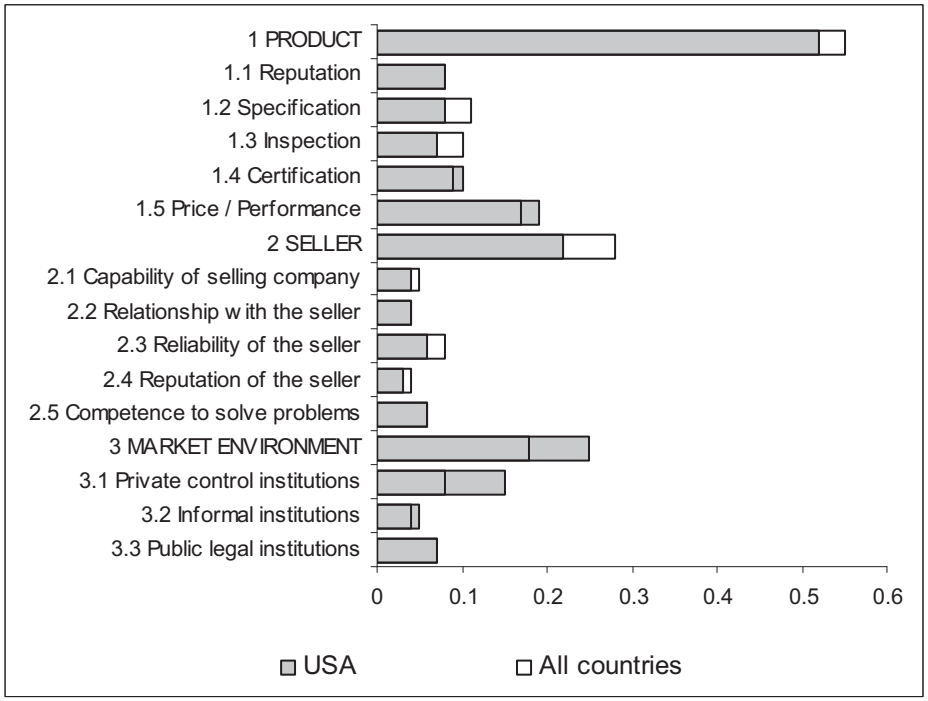
Source: Own elaboration based on Haas et al. 2009a

6.3.6 Data collection and results in USA

The interviewed exporters in the fruit and vegetable sector are total 14 exporters (10 fresh fruit and 4 processed fruit), who were asked to identify the relevance of trust-building factors in their B2B-transactions.

The next Figure 6-34 provides the results of the enterprises regarding the analysis of the importance of trust factors in B2B transactions in the fruit and vegetable sector in USA.

Figure 6-34: Relative importance of trust elements in the USA



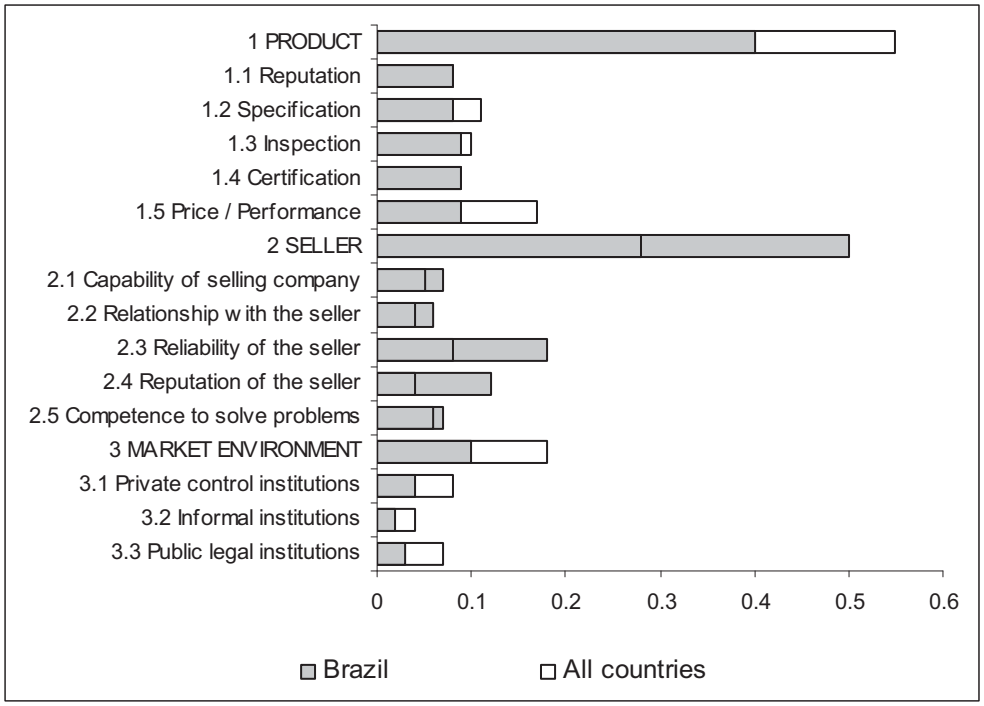
Source: Own elaboration based on Haas et al. 2009a

6.3.7 Data collection and results in Brazil

Five exporters from Brazil were interviewed to identify the relevance of trust-building factors in their B2B transactions. In summary, it can be said that the "seller" and the "reliability of the seller" are the most important criteria in the evaluations. Considering their own products, the "specification", "certification" and "inspection" are valued as very important items and have similar percentages.

In the criterion "market environment", the "private control institutions" play a fundamental role, followed by the "public legal institutions". The presentation of these results from the assessment in Brazil is shown in Figure 6-35.

Figure 6-35: Relative importance of trust elements in Brazil



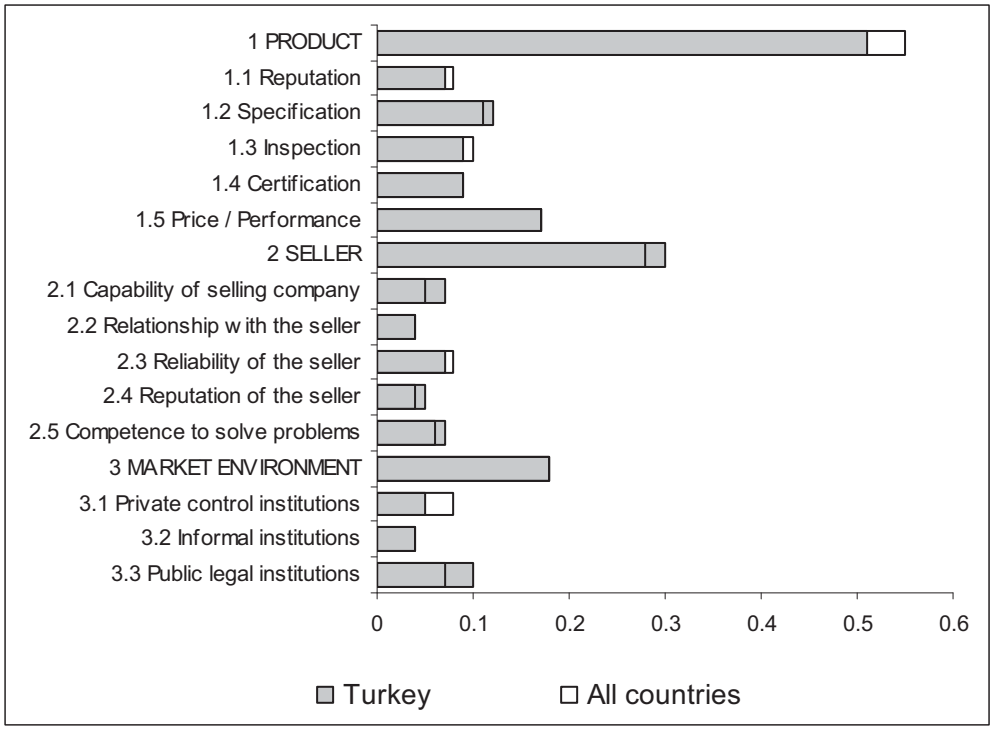
Source: Own elaboration based on Haas et al. 2009a

6.3.8 Data collection and results in Turkey

Nineteenth companies from 3 different sectors (cereals, fruit & vegetable, and olive oil sectors) in Turkey have been interviewed. Figure 6-36 shows the results of the interviews conducted in Turkey. The results have been evaluated on the basis of general evaluation according to hierarchical level.

First of all, the first hierarchical level has been evaluated in general. “Product” was found to be the most important trust object for the companies in all sectors. While “product” is ranked first, “seller enterprise” is second and “market environment” last.

Figure 6-36: Relative importance of trust elements in Turkey



Source: Own elaboration based on Haas et al. 2009a

6.4 Summary

Trust is dependent on the culture as discussed in Chapter 3.2.4. Due to this, Germany is categorised as a masculine society which is defined as needing many safeguards, like certifications, inspections, guarantees as well as items such as "specification" and "price / performance ratio" of the product. Also, personal relationships do not matter too much in business decisions. Information about the seller like "reputation of the seller or the product" is of less importance. This seems to be confirmed by these results.

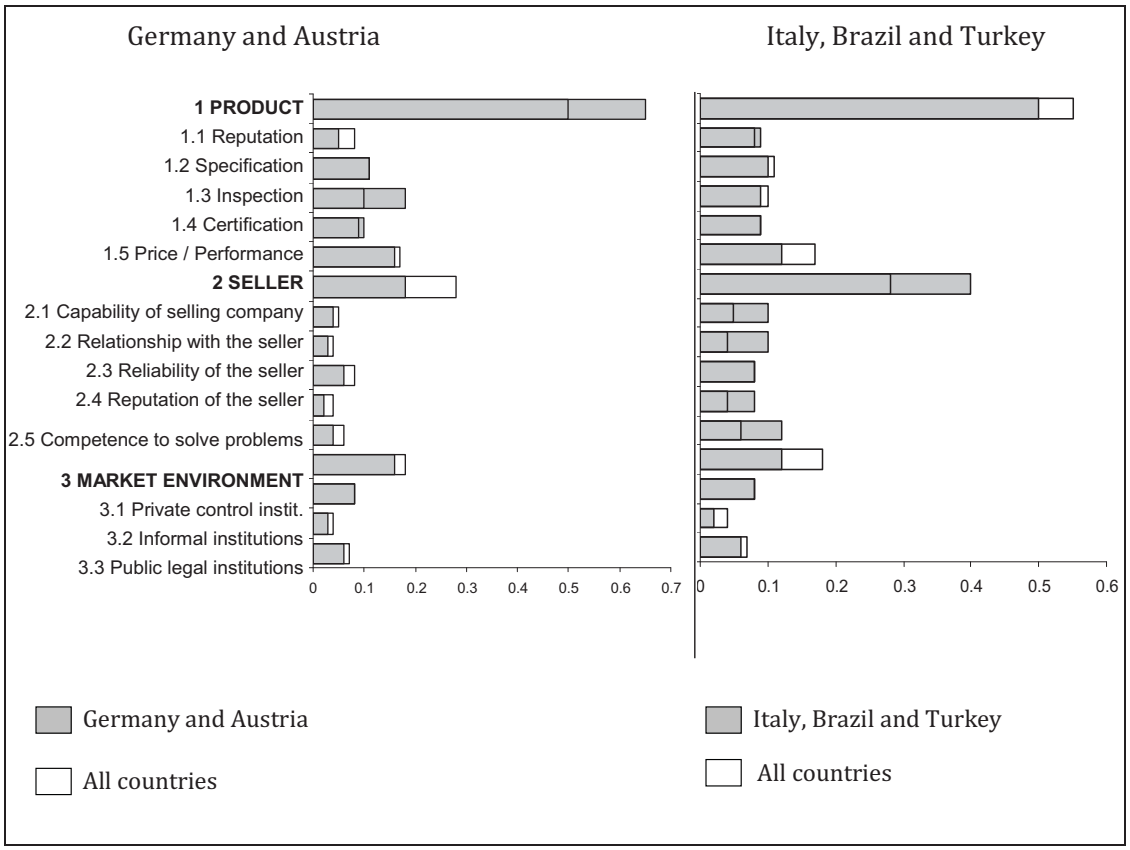
Based on the analysis of the data for each country, some basic cultural differences can be derived.

As the analysis indicates, Austrian and German business leaders are very product-focused. Only the price/performance ratio is of significantly higher importance for German than for Austrian companies. Nevertheless, this pattern may be typical for northern European countries

Brazil, Italy and Turkey, on the other hand, seem to be very relationship-focused. Especially the reliability of the seller and its reputation seem to be of high importance. This pattern cannot be seen in all southern countries within this assessment. Results of Greece and Spain are more or less average.

The Figure 6-37 below shows a comparison between the Northern European countries Germany, Austria (to the left), and the three mentioned southern European countries (to the right).

Figure 6-37: Comparison of more product-focused northern European countries and relationship-focused southern European countries



Source: Own elaboration based on Haas et al. 2009a

Also of interest were the results of Slovenia. Slovenia is the only country where the market environment is of very high importance. In recent years Slovenia has undergone many changes to the market environment due to its new EU membership. This could explain the larger importance of this feature.

By applying the AHP methodology from answers derived from interviews to operators in the olive oil, meat, vegetable/fruit and cereals sectors some very interesting findings could be obtained, but limits of the analysis were also revealed. It is clear that the "product" dimension is the most important factor in explaining trust creation in business relationships, followed by relationship issues with the partner. The market environment is generally of less importance.

However, the "product" dimension is more important than the "seller" dimension. In any case the predominance of the "product" dimension to the "seller" dimension does not allow the conclusion that human relationships do not play a role in transactions. The relevant weight attached to the items "reputation" for the "product" dimension and "reliability of the seller" for the "seller" dimension in the second tier of the typology reveals that informal relationships are still very important together with institutional factors related to product cost and quality.

The relevant weight attached to the "price" item related to the "product" dimension indicates that efficiency in the supply chain plays a crucial role.

7 APPLICATIONS OF TRADITIONAL TRUST ELEMENTS IN E-COMMERCE

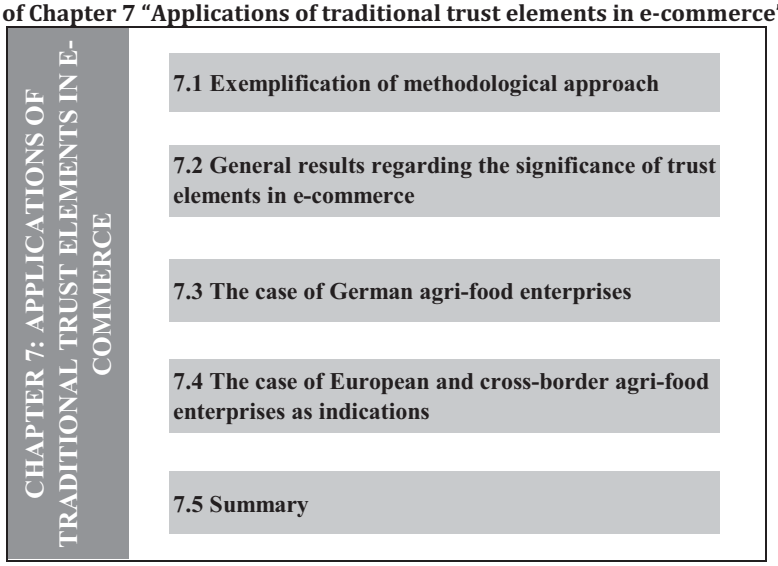
In the previous chapters the role of trust for the international trade relations has been shown, the international trade flows for agri-food products have been identified, the nature of the current exchange between the business partners has been analysed and the importance of the trust elements in the traditional trade has been assessed. Overall, these different steps support the forthcoming approach, namely the examination of the applications in e-commerce which can be transferred from the obtained trust elements in the traditional trade.

Currently, there are Internet technologies facilitating the traditional "face-to-face" initiation of business relationships, and with their rising utilization, the initiating commerce achieves more and more acceptance. Nevertheless, the online transaction is characterised by vulnerability and uncertainty derived from the commonly absent "face-to-face" relation. Anyhow, communicating trustworthiness in the online environment can be handled as sufficiently as in the offline environment. The Internet technologies offer many facilities to support the communication of trustworthiness, e.g. usage of synchronous, audio-visual communication tools.

The focus of this chapter will be to reseach what electronic features can correspond to the identified most essential elements of trust. The obtained findings can be used as indications in the different agri-food chains and countries due to the fact that the analysis is done in several European states and cross-border.

First the methodology of the current approach is explained. Then, the general results of the significance of the trust elements in e-commerce are outlined, concerning two different perespectives, namely the subjective evaluation and direct ranking. Third and fourth, the situation respectively in Germany and in the selected European and cross-border agri-food enterprises is identified as indications. Finally, a discussion and cross-country comparison is provided (see Figure 7-1).

Figure 7-1: Overview of Chapter 7 "Applications of traditional trust elements in e-commerce"



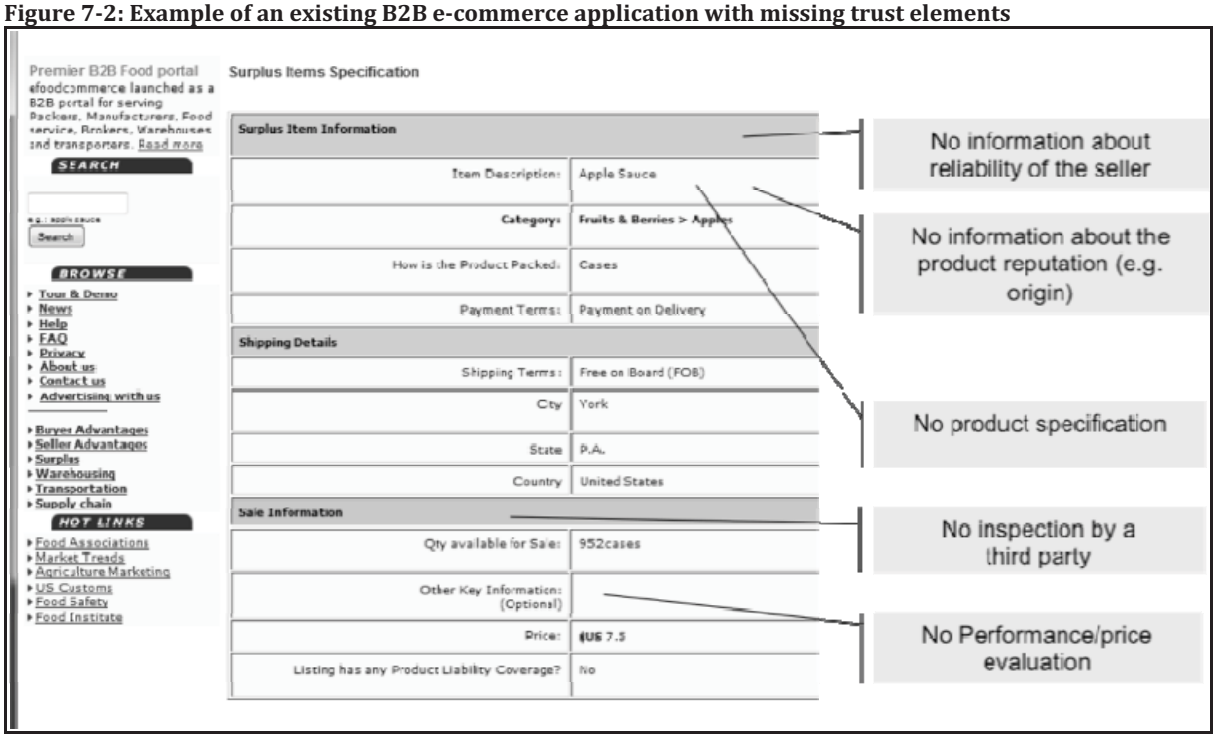
Source: Own elaboration

7.1 Exemplification of methodological approach

The objective of this chapter is to point out electronic features for trust formation with a new supplier in the international online environment regarding agri-food products.

A study of European B2B e-commerce applications in the agri-food sector showed that many companies still have a low level of performing electronic trust elements (HAAS ET AL. 2009b). In Figure 7-2 an example of a webpage with a product description of apple sauce is provided, and evidently essential electronic trust elements are absent.

Figure 7-2: Example of an existing B2B e-commerce application with missing trust elements



Source: Haas et al. 2009b

The current approach is based on the state-of-the-art literature on trust and e-commerce as well as the obtained trust elements assessment.

To identify trust formation towards e-commerce, first, a summarized theoretical overview of different electronic features with respect to the trust elements typology is presented. Next, a selection of the most essential trust elements within the current research is made. Finally, the online questionnaire is designed which will prove the association of the trust formation and possible applications in e-commerce in different agri-food chains within different European and cross-border countries.

As presented in Chapter 3.3 the buyer's initial transaction trust level is deduced from three trust objects: trust in the product, trust in the seller, and trust in the market environment (HOFSTEDE ET AL. 2007).

With respect to the state-of-the-art literature, e-commerce has a high potential to communicate the trustworthiness of all three trust objects. Based on these two statements, in previous study of FRITZ ET AL. 2008 the potential technological features have been applied as trust sources for the single trust objects in the general B2B trust typology of HOFSTEDE ET AL. 2007.

Table 7-1 shows the summarized electronic initiatives of trust regarding the typology of trust.

Table 7-1: Potential electronic trust creation support for the trust typology

Typology of trust (on the buying side)		*Electronic trust elements*
Objects of trust	**Dimensions of the objects of trust**	
1. Product	1.1 Reputation	***[1] Company's awards incorporated into a website***
	1.2 Specification	***[2] Product description, quality levels, and product details (e.g. size and color), presented in a user-friendly way in the Web catalogue***
		[3] Presentation of the products more interactive via podcasts
	1.3 Inspection	***[4] Visualizing technologies via e.g. digital videos of production/processing plant***
		[5] Synchronous communication tools (e.g. video-conferencing)
	1.4 Certification	***[6] Trustmark seals; customer testimonials; certificates available online***
		[7] Using of a podcast to audio-visually introduce the company
		[8] Live video conversation to clarify the last open questions
2. Seller	2.1 Capability	***[9] Information about the company on the website - e.g. in "about us"; "terms of use"***
	2.2 Relationship	***[10] Using a Web blog (in form of a diary)***
		[11] Using a podcast
	2.3 Reliability	***[12] Via the website – an automation by simultaneously providing a high degree of commitment***
		[13] Include a record of the whole communication history within an e-mail - transparent who is involved in the process
	2.4 Reputation	***[14] References of third parties and customers on the website***
		[15] Suppliers' performances on other websites and community platforms
3. Market environment	3.1 Control institutions	***[16] Third party's seal on the website – as a compliance to a certain standard***
	3.2 Informal institutions	***[17] Publishing membership in industry associations***
	3.3 Legal institutions	***[18] Publishing membership in legal associations***

Source: Kohlhaas et al. 2008

In the next Table 7-2 the selection of the potential electronic applications regarding the three trust objects is provided, and these 22 elements are considered and assessed in this thesis. The collection of these electronic initiatives was done by analysing existing web sites and the number in squared brackets relates to the theoretically obtained electronic trust elements in Table 7-1 above (HAAS ET AL. 2009B).

Table 7-2: Visualization of trust elements in e-commerce evaluated within the thesis

PRODUCT	COMPANY	MARKET
• Comments of buyers [6] • Evaluation [6] • Specification [2] • Pictures [2, 3] • Visit of production site [2, 4] • Webcam [5, 7] • QM certificates (e.g.ISO 9001) [1, 6] • QM systems in the food sector (e.g.IFS) [1, 6] • Price comparison [3] • Description [2, 4]	• About us [9] • Image video [7, 9] • Contact Info [9] • Web blog [10, 11] • Warranties [9] • Tracking system [12, 13] • Reference customers [14] • Seller evaluation [15] • Complaint management system [12] • Dispute Mechanism [12]	• Country info [16-18] • Legal info [16-18]

Source: Haas et al. 2009b

Based on this collection an online questionnaire is developed which aims at the evaluation of the electronic applications for trust formation in four agri-food chains within 6 European countries

and three non-European countries. The selection of the agri-food chains and countries is handled with the same procedure as the approaches in the previous chapters. Overall, the respondents are enterprises dealing in cereals, meat, fruits and vegetables, and olive oil sectors from Germany, Austria, Italy, Slovenia, Greece, Spain, USA, Brazil and Turkey.

The Enterprise Feedback Suite (EFS) survey created by Globalpark is chosen as a tool for the online questionnaire. EFS survey supports different recruitment methods for survey participants and especially for anonymous surveys, which are conducted on web sites (GLOBALPARK 2009). The EFS survey also enables sophisticated participant quota controls and offers an e-mail dispatch system that can be used to control the flow of invitations and reminders.

Subjective evaluation and direct ranking of the significance of trust elements in e-commerce

The assessment of the electronic applications regarding the trust elements is conducted from two perspectives, on the one hand subjective evaluation and on the other hand direct ranking. In following the main procedure is presented.

Subjective evaluation

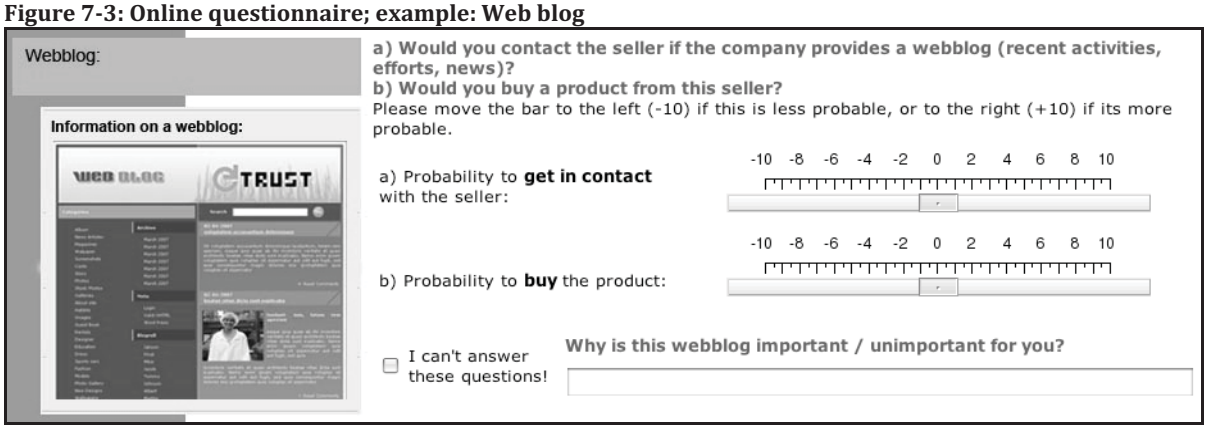
First, the estimation is carried out subjectively using a simple scale from -10 (not important at all; lowest probability to get in contact/buy) to +10 (absolutely important; highest probability). Thus, the respondent is requested to quote the probability in case of encountering these trust elements that

(1) he/she would contact the seller

(2) he/she would buy a product from this company

The same procedure is repeated for all obtained 22 electronic initiatives presented above. An example of the application "web blog" is presented in Figure 7-3.

Figure 7-3: Online questionnaire; example: Web blog

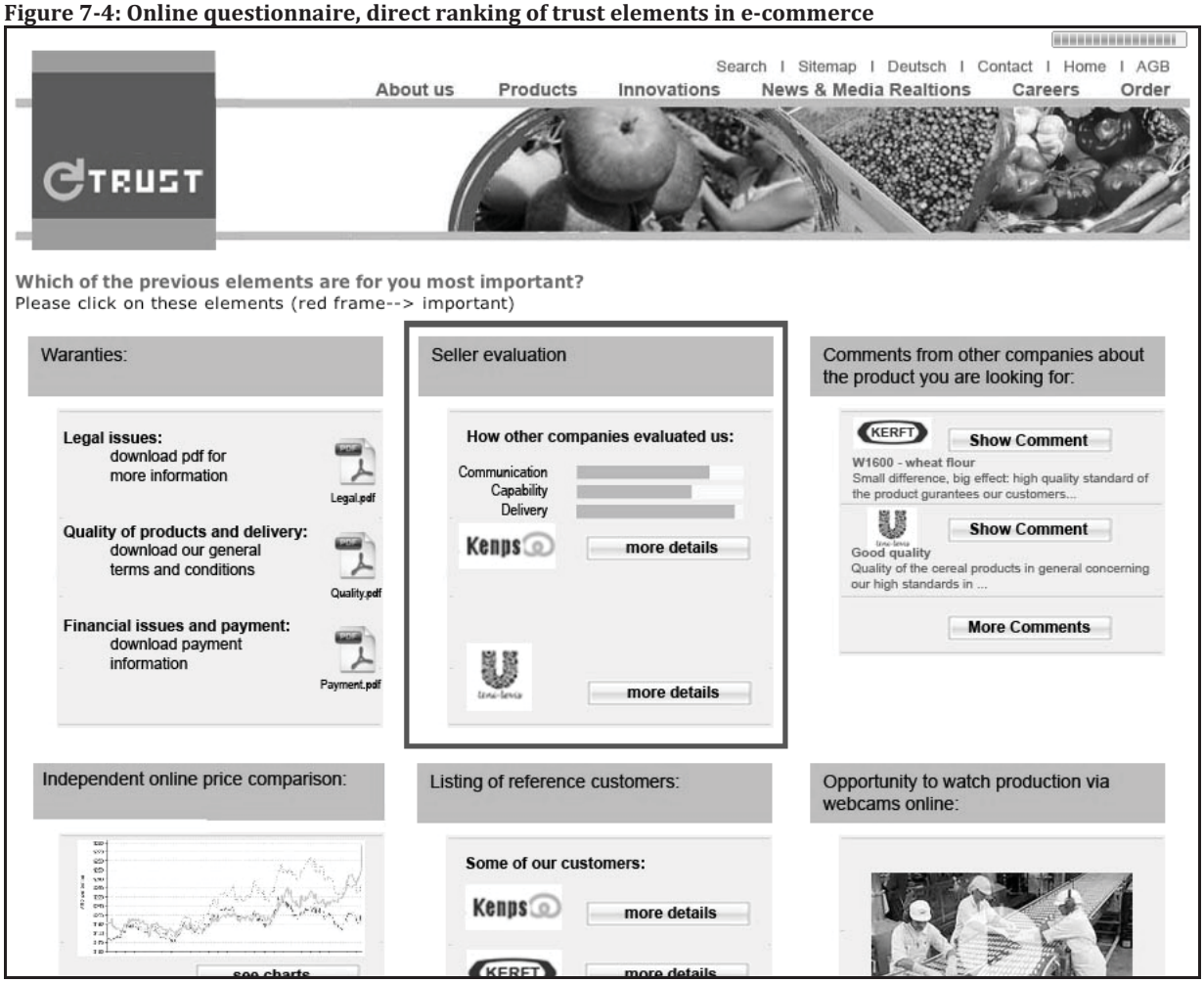


Source: Haas et al. 2009b

Direct ranking

The direct ranking is generated in a last step of the evaluation of the features for trust creation. The interviewees were asked to rank directly the 22 elements of trust with respect to their personal significance. It is a free choice for the selection and can be none or all (see Figure 7-4).

Figure 7-4: Online questionnaire, direct ranking of trust elements in e-commerce



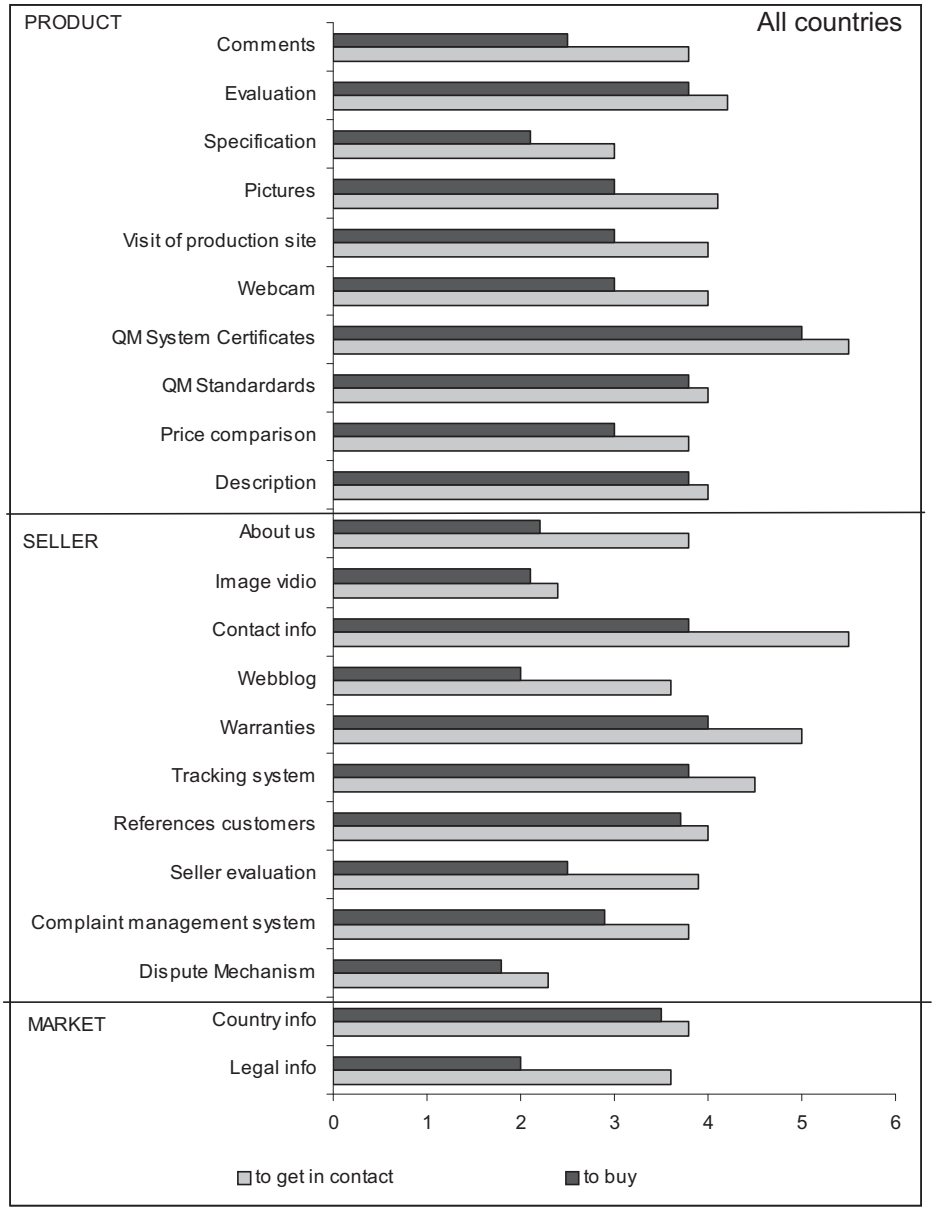
Source: Haas et al. 2009b

7.2 General results regarding the significance of trust elements in e-commerce

In this section the summarized results from all participating countries (Austria, Germany, Italy, Slovenia, Greece, Spain, USA, Brazil and Turkey) are provided. On the one side the assessment is presented from the perspective of "subjective evalutaion" and on the other side from the "direct ranking" perspective.

Overall, no element was rated to be not significant at all. A detailed overview of the subjective evaluation is shown in Figure 7-5 below.

Figure 7-5: Evaluation of trust elements (n=89)



Source: Own elaboration based on Haas et al. 2009b

In general, the following indications can be identified with respect to the "subjective evaluations":

- Quality management certificates, performed for example via ISO 9001:2008; this application is measured to be the most significant one independent of search for contact and/or buy the product;
- The purchase of a product is mainly connected to an independent proof of the quality of it (QM certificates) and to a thorough product description and specification of quality;
- Concerning contact: contact information is absolutely necessary; however, this element alone will not influence the buying decision of potential customers above average;
- Least important elements (which may not support the trust formation to a significant extent) are: image video, web-blog, photos/pictures of the products, dispute mechanisms;

- All other elements are of average importance and may help to increase trust creation of a B2B e-commerce application (HAAS ET AL. 2009B).

In summary it can be said that performing these signals improves the facility to get in contact more than the facility to buy a product; anyway, the second opportunity is connected to a much higher perceived risk. Hence, the facility to get in contact if the signals presented herein can be found on the B2B application is higher compared to the facility of buying a product.
With respect to the direct ranking of the interviewed, the following assumptions can be recognized:

1. Prior-ranked elements of trust:

- QM certificates (32%)
- Contact info of the seller (30%)
- Specification of the product (29%)
- Description of the product (28%)
- Warranties (26%)

2. Second most important elements of trust:

- Reference customers (23%)
- Independent price comparison (23%)
- Webcam for online-stream of pictures/videos of production (22%)
- Online tracking system of a delivery (21%)
- Possibility of visiting the production facilities (20%)
- Photos/(high resolution) pictures of the products (20%)
- Evaluation of the products by other B2B customers (18%)
- Legal information for international trade (16%)
- QM standards (15%)
- Complaint management system (15%)
- Detailed description about the company (“About us”) (15%)

3. Elements of trust with average and low importance:

- Comments from other companies about the product(s) (13%)
- Country info (origin of the product and head office of the company) (13%)
- Seller evaluation (11%)
- Image video/podcast of the company (9%)
- Web-blog (5%)
- Dispute resolution mechanism (4%)

These elements listed above might facilitate the trading in e-commerce due to more entertaining or informative features. The visualization of all trust elements used within the online questionnaire and the related importance factor can be taken from the Annex 4.

Table 7-3: Comparison of the trust elements in e-commerce concerning "subjective evaluation" and "direct ranking"

Rating of the trust elements	Trust elements in e-commerce * (concerning P / S /M)	Evaluation of importance		Direct ranking
		to get in contact	to buy	
Should not be missing	**QM system certification (P)**	1	1	1
	Contact info(S)	2	6	2
	Warranties (S)	3	2	5
	Specification (P)	5	7	3
	Description (P)	9	4	4
	Tracking system (S)	4	5	9
	Reference customers (S)	8	8	6
Could help to increase trust	***QM Standards (P)***	7	3	14
	Webcam (P)	10	9	8
	Visit of production (P)	6	11	10
	Price comparison (P)	14	11	6
	Complaint management system (S)	12	14	14
	Seller evaluation (S)	12	10	19
	Evaluation (P)	16	15	12
	Comments (P)	11	17	17
	Country info (M)	15	13	17
Not affect on trust formation	About us (S)	17	16	14
	Photos (P)	19	19	10
	Legal info (M)	18	20	13
	Image video (S)	21	18	20
	Web-blog (S)	20	21	21
	Dispute Mechanism (S)	22	22	22

* P = Product; S = Seller; M = Market environment

Source: Haas et al. 2009b

Table 7-3 presents a comparison between the "subjective evaluation" and "direct ranking" with respect to the importance of the obtained trust elements in e-commerce. There are three different blocks: 1) should not be missing; 2) could help to increase trust; 3) not affect on trust formation. The evaluated trust elements in e-commerce from all thre blocks are connected with the two types of assessment ("subjective evaluation" and "direct ranking"). It is obvious that the most significant element of trust is QM system certification. Nevertheless, the QM standard is

placed in the second group ("could help to increase trust") and seems to be not so essential in the direct ranking (on the 14th place). A possible explanation could be that if one standard is avaible, then the second is superfluous and hence of much lower significance.

7.3 The case of German agri-food enterprises

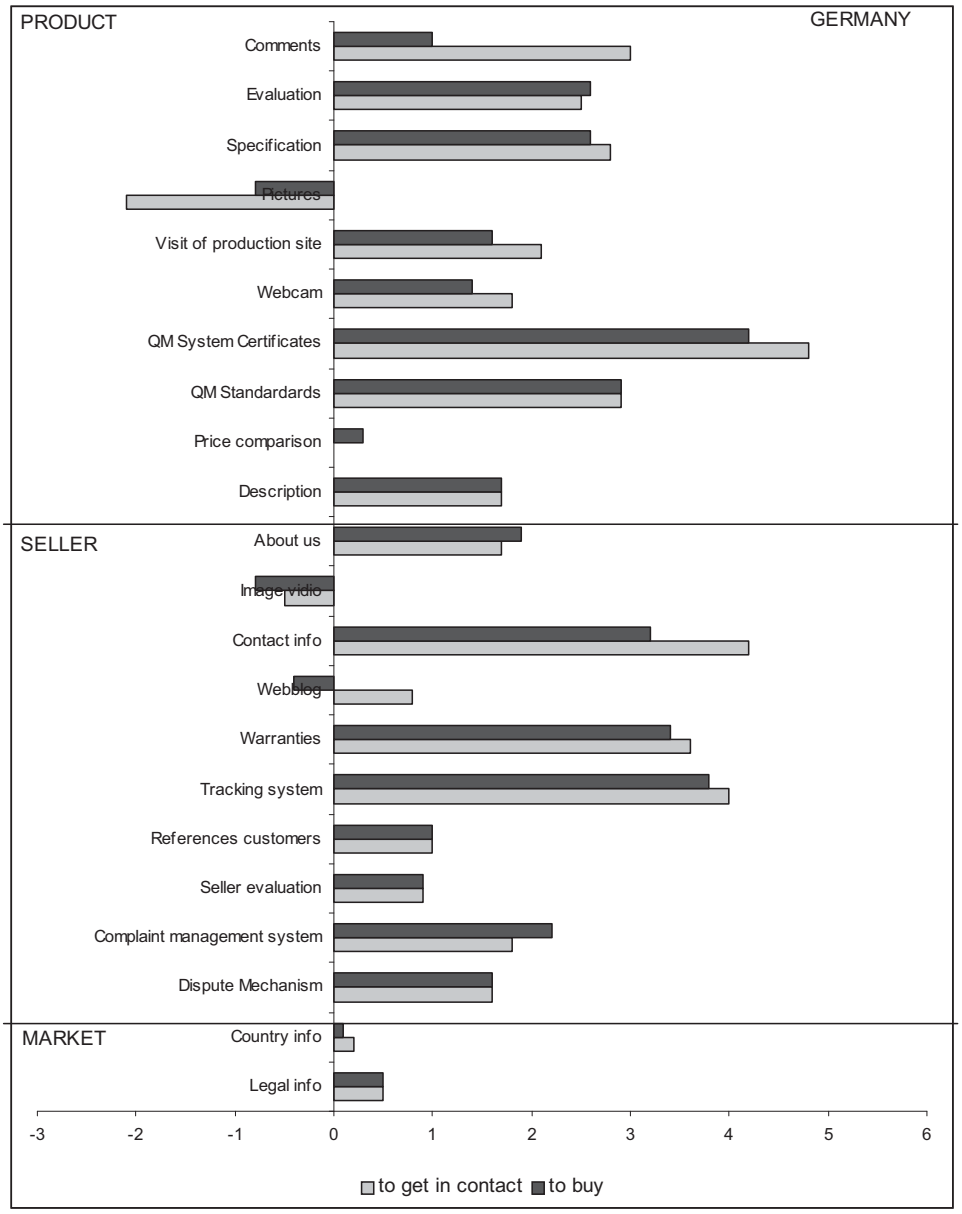
In this subchapter the findings according to the importance of trust elements in e-commerce from the point of view of German agri-food enterprises are outlined. The findings are collected concerning the cereals, meat and fruits and vegetables agri-food chains in Germany. The respondents are companies which deal with international traders and mainly with the import of agri-food products. A detailed overview of the queried companies is given in Annex 5.

The Figure 7-6 sums up the results according to the subjective evaluation, which are provided by all respondents and for all three agri-food sectors in Germany.

On the first level of the trust typology "product", it is evident that the technical features concerning the trust element "QM system certificates" are of highest importance both for "getting in contact" and "buying". Following without a significant difference in their rating are the electronic trust elements: "Evaluation", "Specification", and "QM standards".

The second level of the trust typology in the figure shows several essential trust elements for dealing with e-commerce. In first place, the factor "contact info" is evaluated to be the most important for all enterprises, followed by "tracking system". The "warranties" are also of particular importance. There is no large difference between the questions of "getting in contact" and "buying the product". The factors within the third level "market environment" are of a low level of importance.

Figure 7-6: Evaluation of trust element in e-commerces, Germany (n=12)



Source: Own elaboration based on Haas et al. 2009b

7.4 The case of European and cross-border agri-food enterprises as indications

The following section provides findings which are collected from all countries which took part in the analysis concerning the subjective evaluation of the importance of trust elements in e-commerce. Since the number participants is small, these findings are of a qualitative nature.

The results are presented from two different points of view - first, the feasibility to get in contact and second, purchasing the appropriate agri-food product.

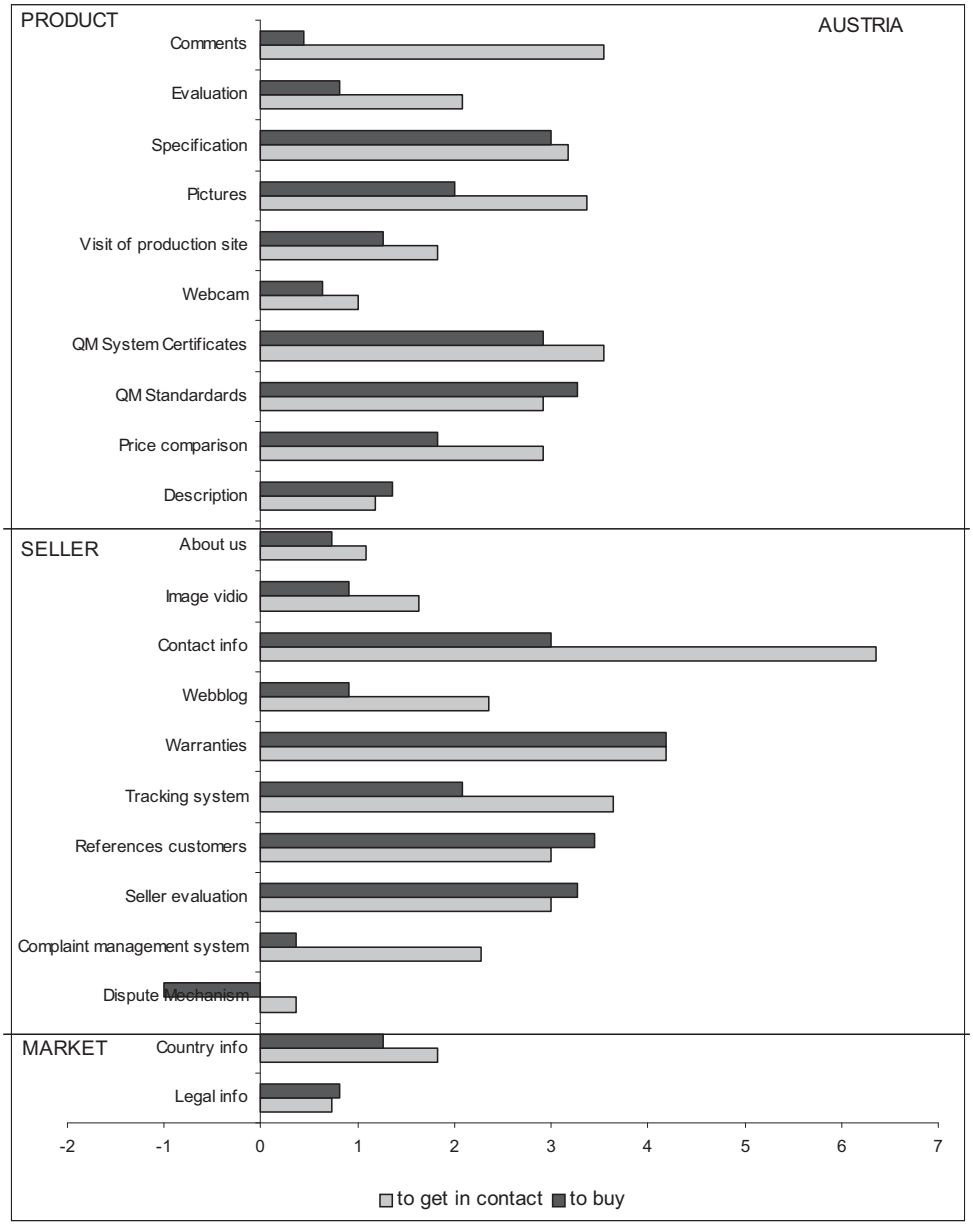
The collected applications can be helpful for the enhancement of trust in e-commerce.

The following Figure 7-7 provides the results from Austria.

In general, the feasibility to “get in contact” is much higher than for “buy the product”. Several elements building trust are in particular “comments”, “specification”, “pictures”, “QM system certifications” on the first level of the trust typology, namely the “product”.

Within the second main group trust elements "the seller / company", applications about the "contact info" should be presented. The warranties and the tracking systems play an important role as well and are situated in second place. From the "market environment" the Austrian companies need information about the country.

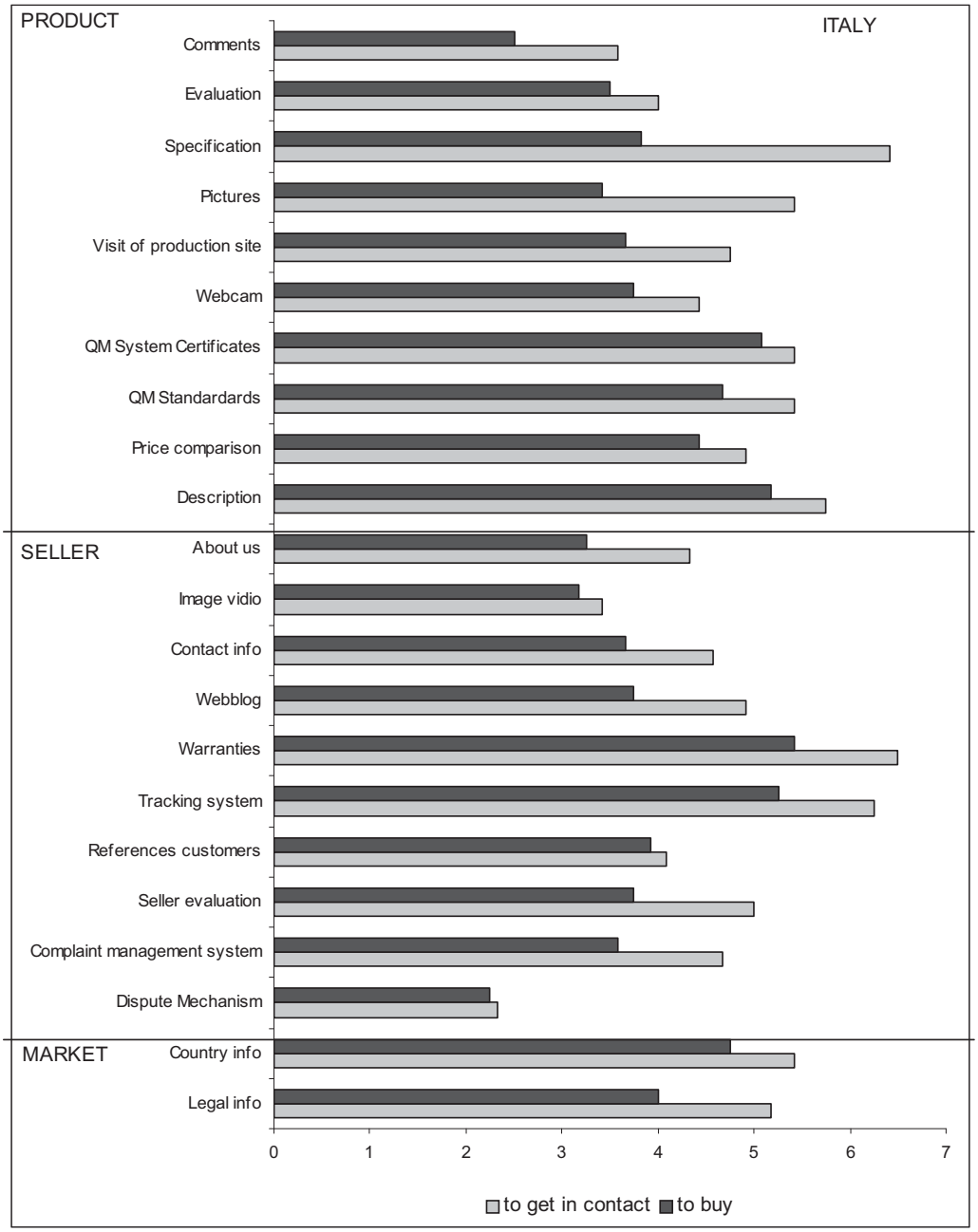
Figure 7-7: Evaluation of trust elements in e-commerce, Austria (n=11)



Source: Own elaboration based on Haas et al. 2009b

The situation in Italy shows that the feasibility for "getting in contact" and "buying the product" is much higher than average, and there are several elements which have similar ratings. In general, the three most essential elements that can support building trust in e-commerce are "specification" of the product, "warranties" and "tracking system" of the company. A detailed overview of the Italian results is presented in the figure below (see Figure 7-8).

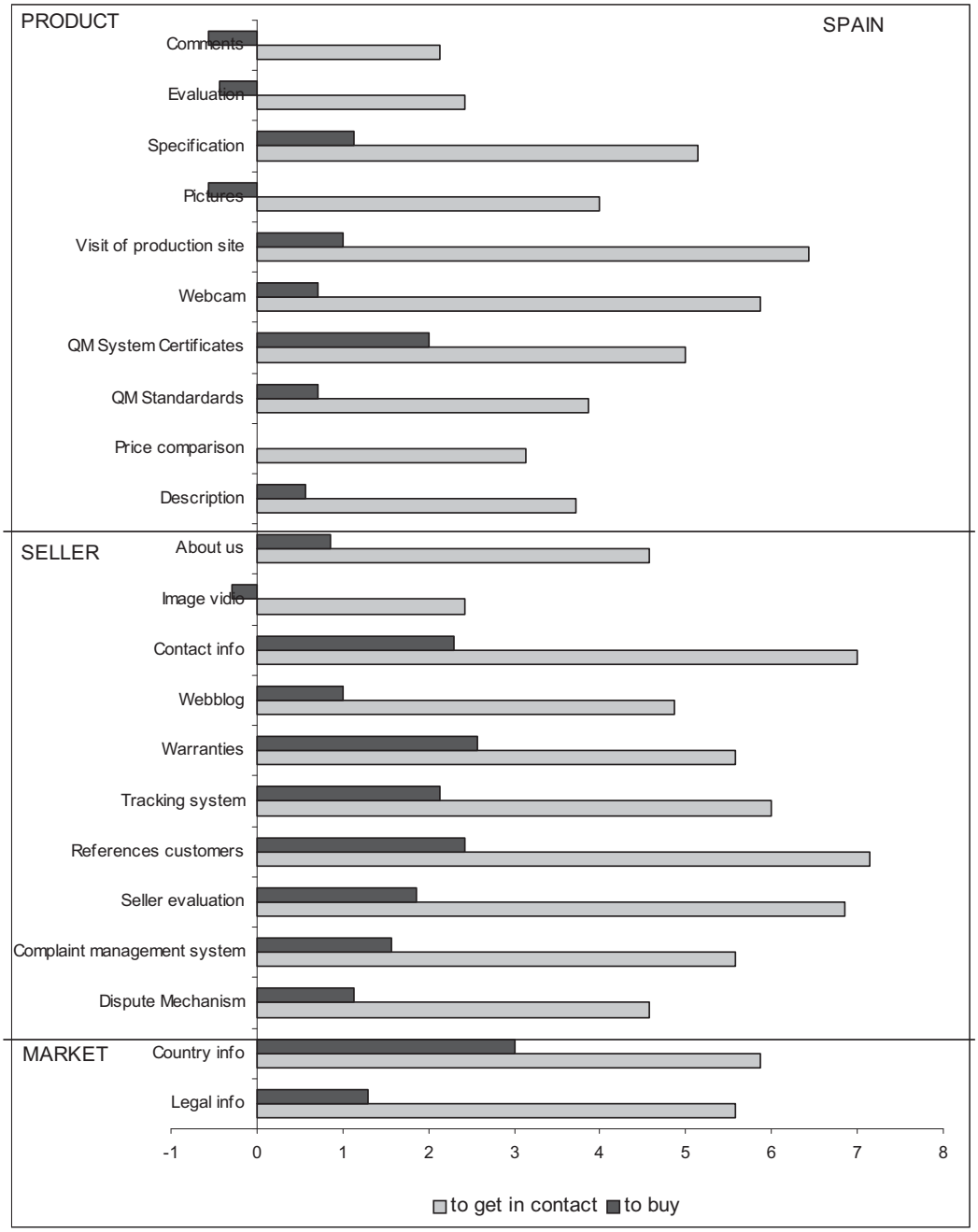
Figure 7-8: Evaluation of trust elements in e-commerce, Italy (n=12)



Source: Own elaboration based on Haas et al. 2009b

With respect to the other countries, in Spain all of the indications for "getting in contact" are much higher, and there is a significant difference between the feasibilty for "getting in contact" and "buying the product". Conceivably Spanish companies tend mainly to get in contact; however, the same signals are not very useful to increase the probability of buying products (without knowing the seller in person). It seems to be important that this applies to many elements regarding the trust factor "company" like "contact info", "references customers" and "seller evaluation" (see Figure 7-9). This finding supports the evidence from the assessment of the trust elements in the previous Chapter 6.

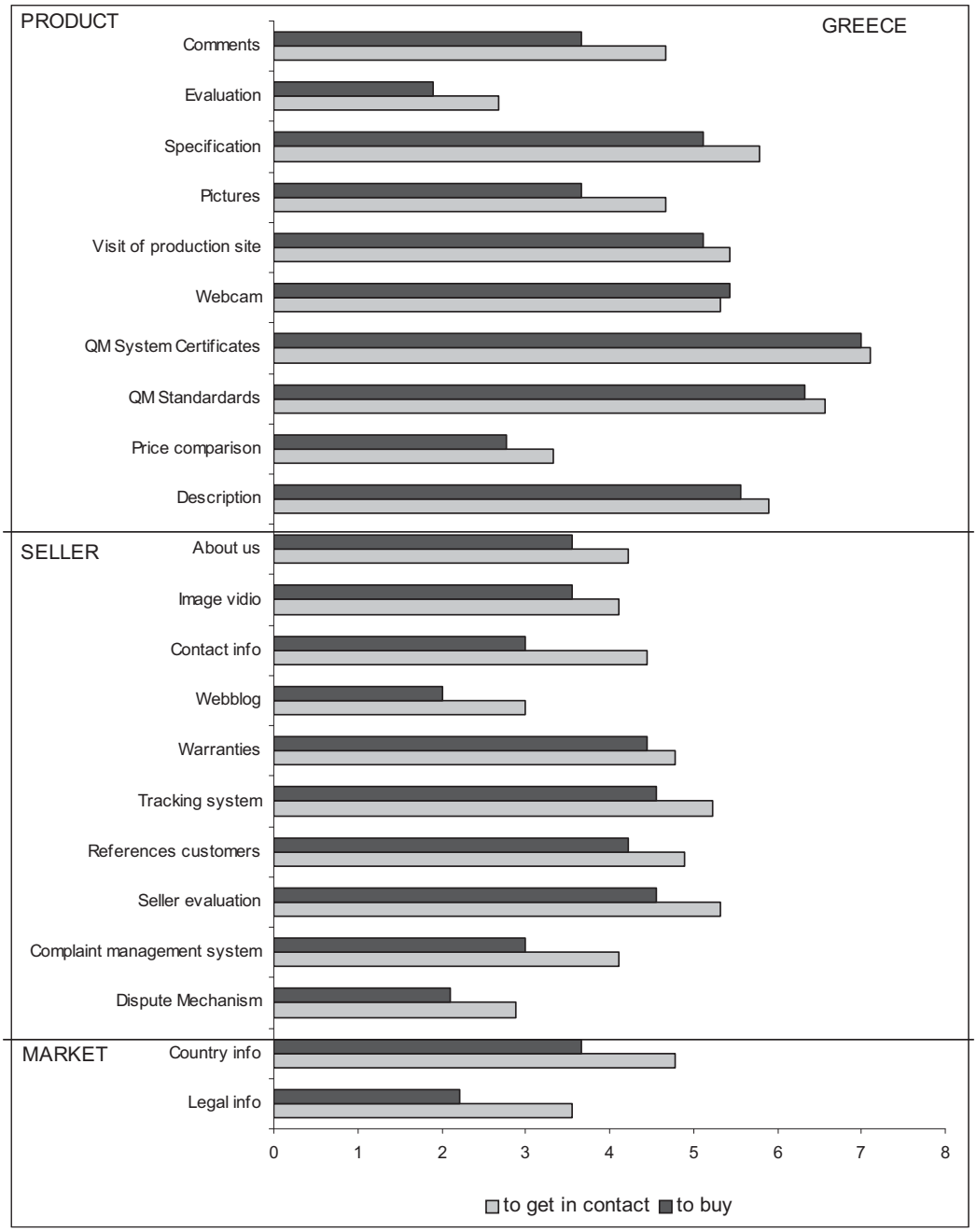
Figure 7-9: Evaluation of trust elements in e-commerce, Spain (n=7)



Source: Own elaboration based on Haas et al. 2009b

Contrary to the Spanish results, the Greek companies tend mainly to require information regarding the "product" category, but similar to Italy and Spain, their outcomes are much higher than average. In general, the best rating is given to the "QM system certifications" and "QM system", which is very similar to the German results. The rating of all other factors is presented in the figure below (see Figure 7-10).

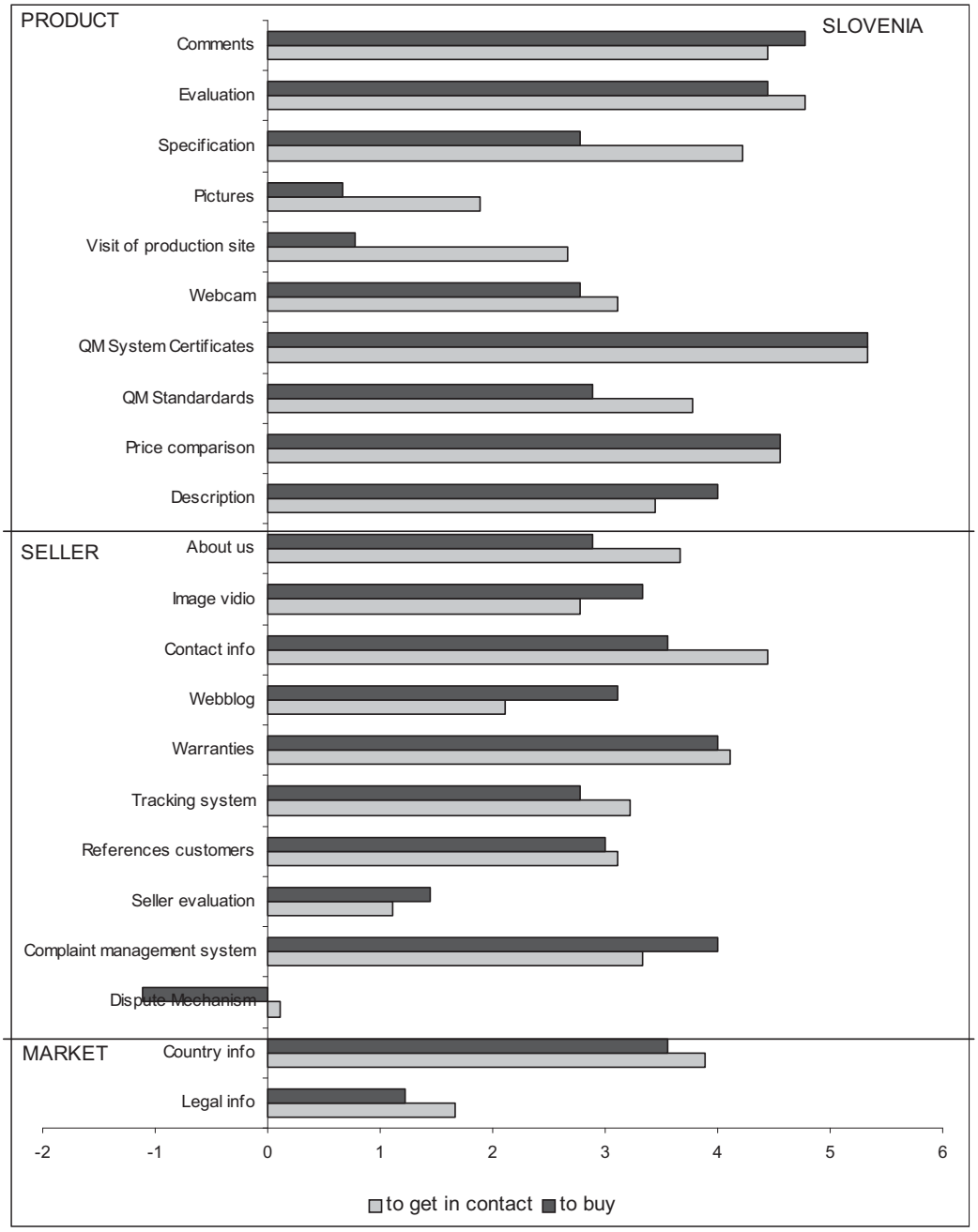
Figure 7-10: Evaluation of trust elements in e-commerce, Greece (n=9)



Source: Own elaboration based on Haas et al. 2009b

The indications for Slovenia present a very similar rating in all three main categories of the trust typology. The most essential of the applications supporting the generation of trust in e-commerce are the "the QM system certification", "comments", "evaluation" within the "product" category, the "contact info", "warranties" within the "seller" category and within the "market environment" the "country info" (see for more details Figure 7-11).

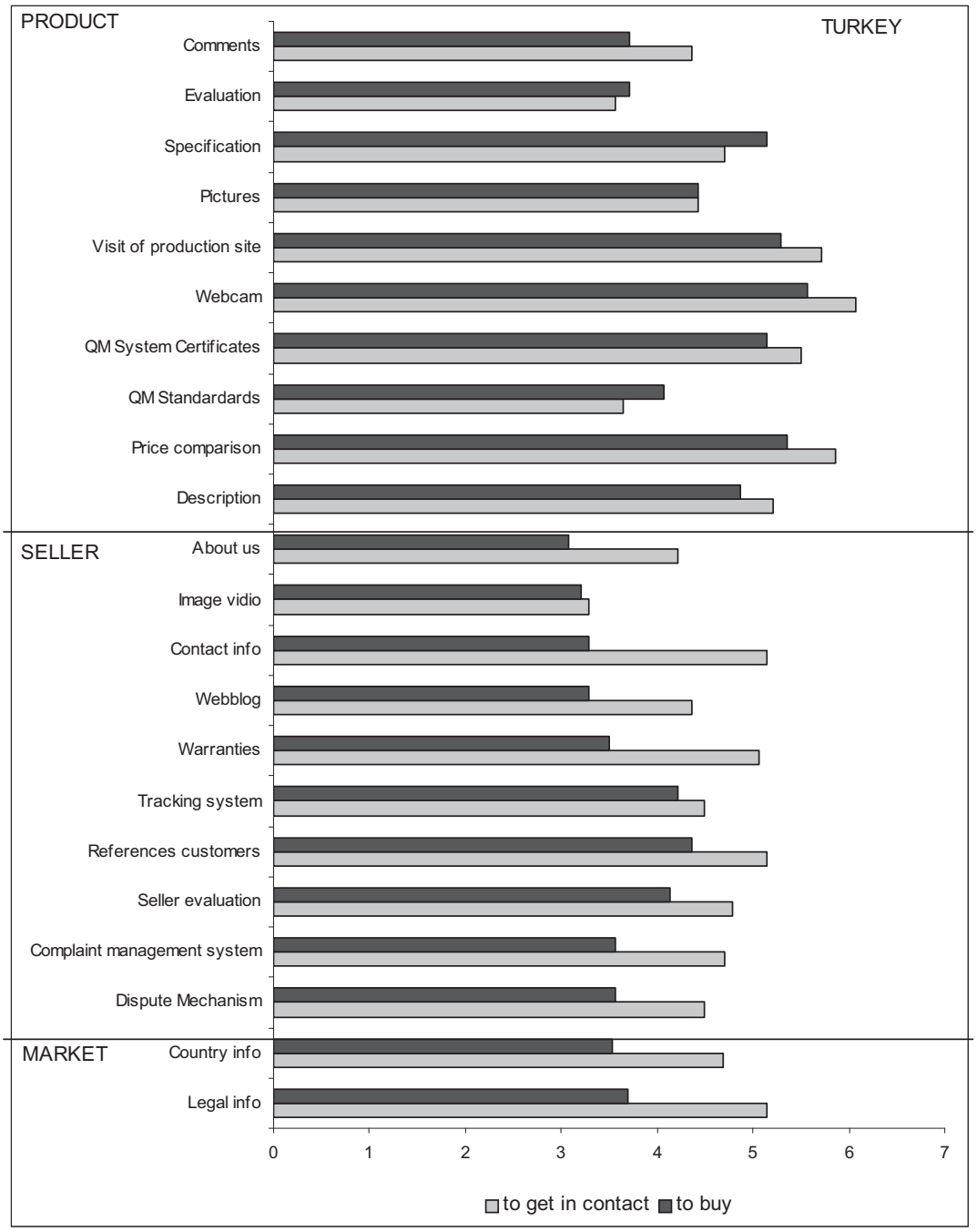
Figure 7-11: Evaluation of trust elements in e-commerce, Slovenia (n=9)



Source: Own elaboration based on Haas et al. 2009b

With respect to the indications which are identified from the Turkish enterprises, there are again no large differences between the three main categories of the trust typology. The feasibility for "getting in contact" and "buying the product" is above average. The most signicant application is using a "webcam". All other findings are evaluated at very similar rating (see Figure 7-12).

Figure 7-12: Evaluation of trust elements in e-commerce, Turkey (n=14)

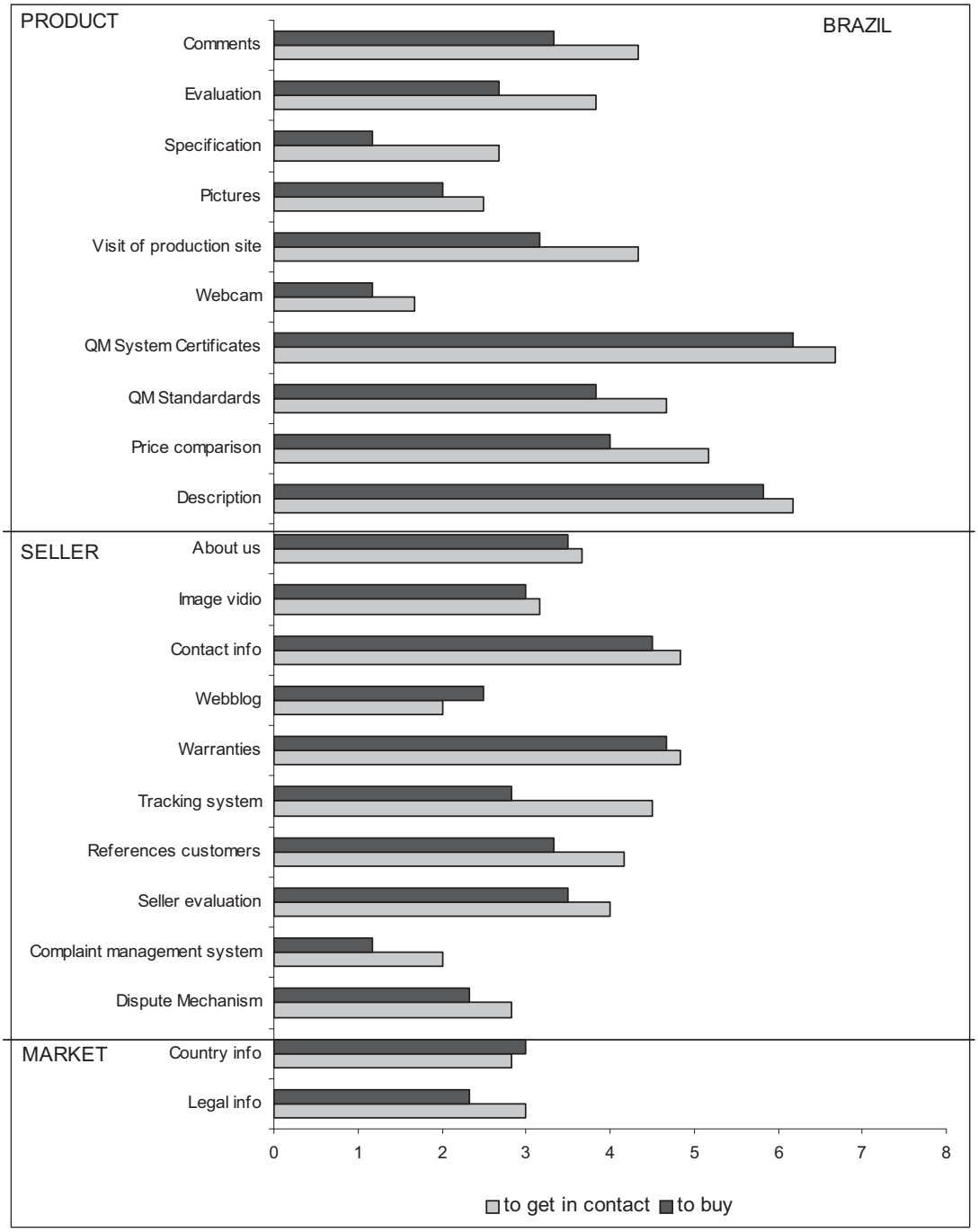


Source: Own elaboration based on Haas et al. 2009b

The feasibility of "getting in contact" or even "buying the product" in Brazil is higher than average for most of the applications. Only the factor "contact info" is below average.

The elements which can support the building of trust for the Brazilian enterprises are in particular "QM system certificates" and "description" of the product. The detailed overview is shown in Figure 7-13.

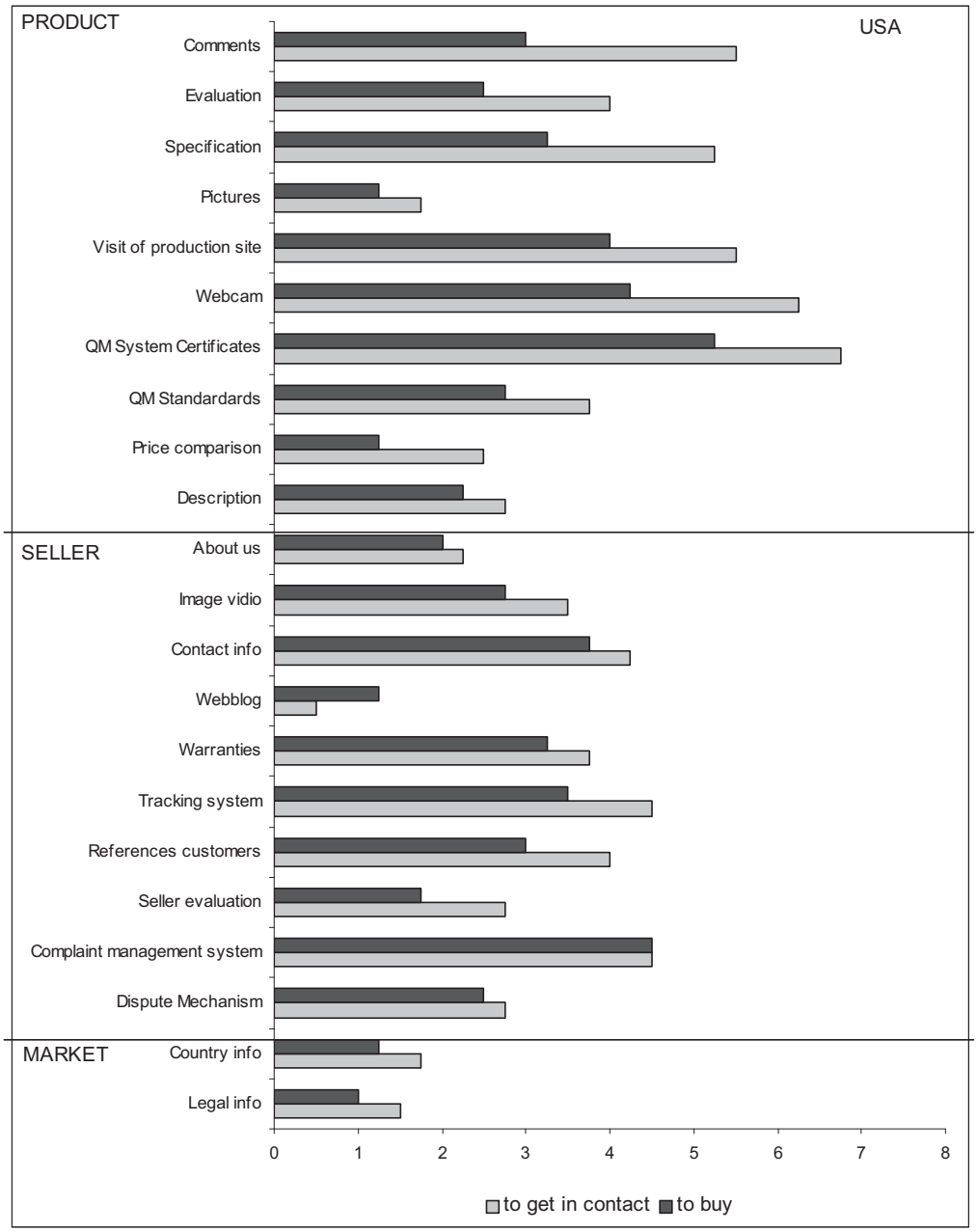
Figure 7-13: Evaluation of trust elements in e-commerce, Brazil (n=6)



Source: Own elaboration based on Haas et al. 2009b

In the first category of the trust typology "product" the identified applications in the American enterprises for the feasibility of both "getting in contact" and even "buying the product" are higher than average. On the other hand, the findings for the "seller" and "market" categories are lower than average. The most important application which helps the generation of trust in e-commerce is considered to be the "QM system certificates" and the usage of "webcams". The complete findings are presented in Figure 7-14.

Figure 7-14: Evaluation of trust elements in e-commerce, USA (n=4)

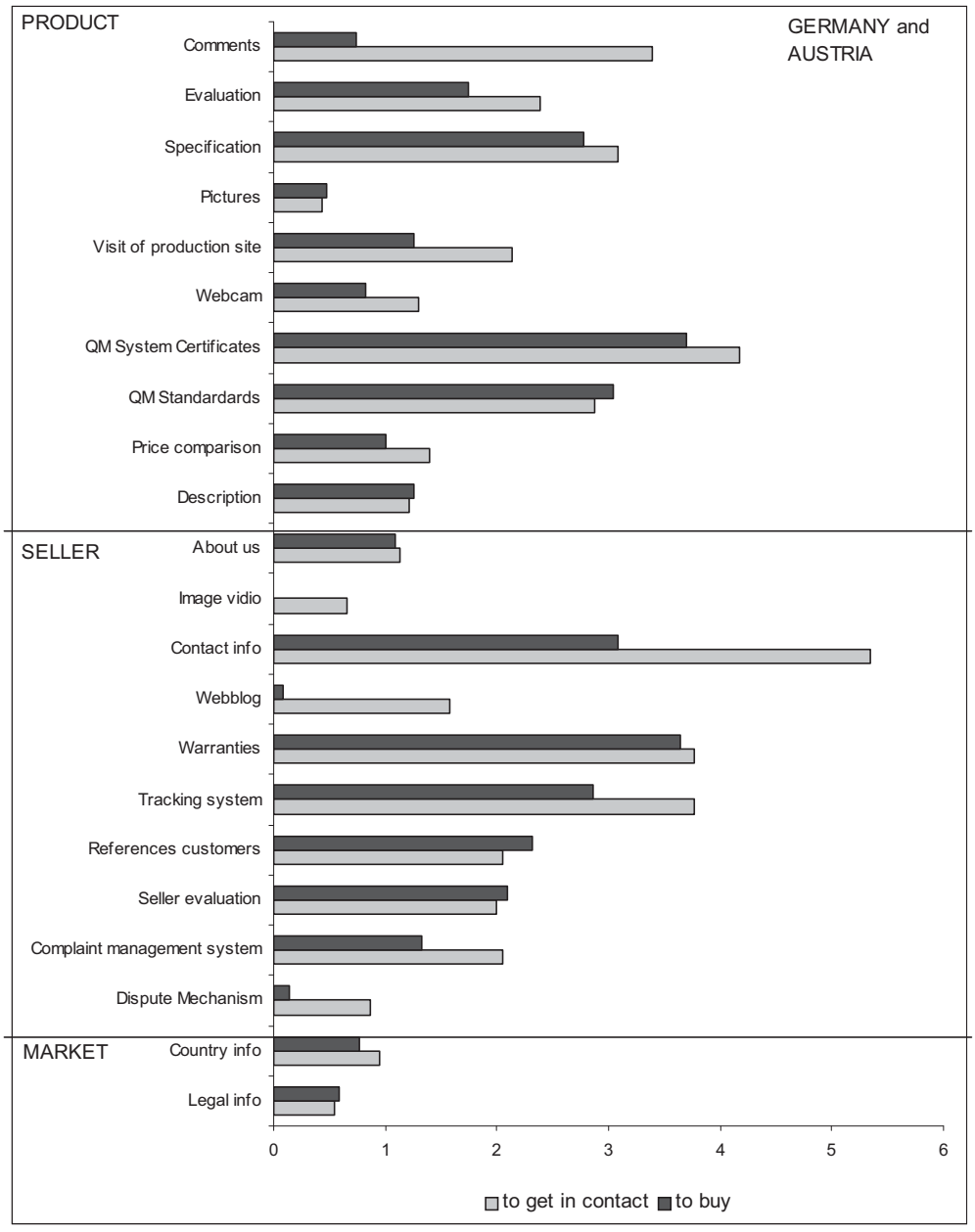


Source: Own elaboration based on Haas et al. 2009b

7.5 Summary

The probability seems to be connected to differences between countries as well. In particular, in Germany and Austria the probability is usually much lower for both "to get in contact" and "to buy" (see Figure 7-15). This outcome is comparable to the results presented in Chapter 6 but allows a divergent interpretation: Northern European countries are usually more suspicious concerning B2B-induced business relations; trust-building elements have lesser impact on causing customers to get in contact or buy in comparison to Southern European countries.

Figure 7-15: Evaluation of trust elements in e-commerces, Germany and Austria (n=23)

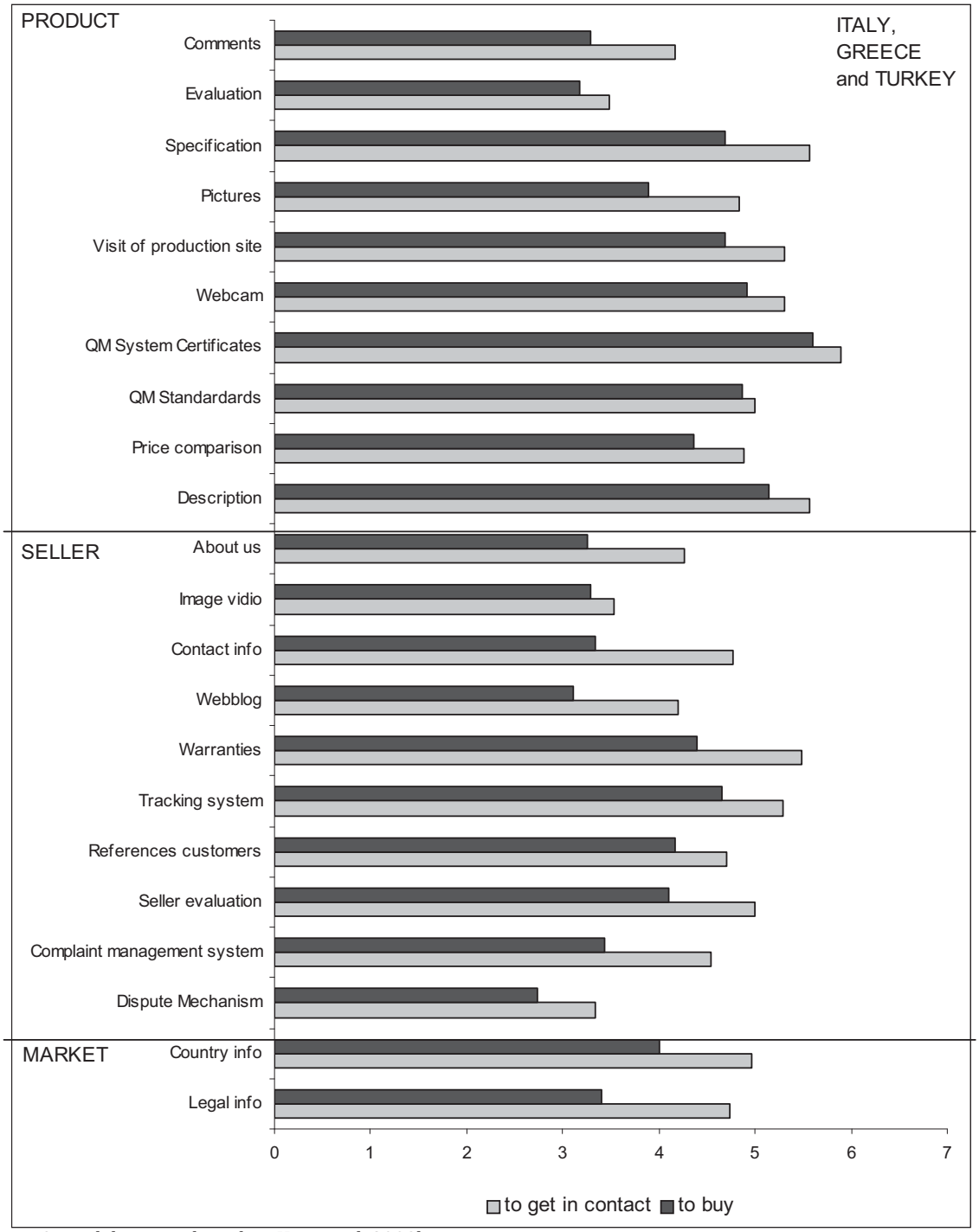


Source: Own elaboration based on Haas et al. 2009b

While the signals do increase the probability to get in contact and/or buy a product, that increase is much lower compared to other countries. In particular, in Italy, Greece and Turkey

the probability is above average. Only the element "contact info" (the most important one) is below average (see Figure 7-16).

Figure 7-16: Evaluation of trust elements in e-commerces, Italy, Greece and Turkey (n=35)



Source: Own elaboration based on Haas et al. 2009b

8 CONCLUSIONS AND OUTLOOK

E-commerce offers opportunities for a better competition by developing new products and markets, by bringing new actors onto the traditional markets and by developing new types of relationships between the traders. Additionally, using e-commerce, costs can be reduced and the satisfaction of the traders concerning faster delivery can be increased.

Nevertheless, electronic transactions are not common in the agri-food sector compared with other businesses. A low level of ICT prevails although it has a significant role in the overall European economy.

Every B2B relationship and also e-commerce starts with a first transaction. The initial transaction only takes place when the buyer's perceived trustworthiness of the supplier exceeds the buyer's perceived risks of the transaction. However, the challenge of the first transaction in e-commerce is how to communicate trust without any previous experience which helps enterprises to trade cross-borders and profit from the online environment especially in the agri-food sector which deals with complex products due to different uncertainties and risks regarding the food quality and safety.

The primary objective of this thesis is to analyse which elements of trust are essential in searching for a new international supplier and how these can be applied / illustrated in e-commerce. Applications are developed by examining selected European and cross-border agri-food chains to give answers to the following research questions:

- Where does the highest potential exist for new trade partners regarding the international trade flows?
- What nature of trade relationships can be identified in the most relevant international trade flows?
- Which elements of trust have an impact on the buyers' decision for the occurrence of cross-border transactions?
- What are the most essential elements of trust that influence the buyers' decision to engage in cross-border transactions along the examined agri-food chains and for different cultural backgrounds?
- What electronic features can correspond to the identified most essential elements of trust?

The main objective and the answers of the research questions can be achieved by following a stepwise approach:

- Identification of the most relevant trade flows;
- Exploration of trade relationships along the most relevant trade flows;
- Assessment of significance of traditional trust elements;
- Applications of traditional trust elements in e-commerce.

The identification of the most relevant trade flows *(step one)* has been used as a basis for the future research and to find out where the highest potential for the introduction of e-commerce in the international trade exists (see ***Chapter 4***). The focus was mainly on four agri-food supply

chains: cereals, meat, fruit and vegetables, and olive oil. Additionally, an investigation of all tiers of the supply chain – production, consumption and import/export – was carried out.
With respect to the statistical database, the trade flows are recognised for each of the agri-food sectors mentioned above and regarding the following criteria:

- the two most relevant products for export at every level of the agri-food chain with the two most relevant destination countries;
- the two most relevant products for import at every level of the agri-food chain with the two most relevant countries of origin.

The procedure has been applied to six European traders in agricultural products (Germany, Austria, Italy, Slovenia, Greece and Spain) and three non-European countries (USA, Brazil and Turkey). The trade structures differed in the selected countries, and there is a complex picture. Wheat and maize are major primary cereal commodities which are imported as well as exported. Most imports and exports concerning meat are of cattle, pigs or chickens. Overlapping trade flows could be identified between some countries, such as Germany, Austria, Italy and Spain.
The *second step* of the stepwise approach has been the exploration of the nature of the trade relationships which prevail in the identified most relevant trade flows (see ***Chapter 5***). The exploration has been conducted in the selected European countries (Germany, Austria, Italy, Greece, Spain and Slovenia) and the cross-border countries (USA, Brazil and Turkey) along four agri-food sectors (cereals, meat, fruits and vegetables, and olive oil). The experts from the agri-food enterprises have been asked to describe the nature of their international transactions, whether they use contracts and if quality certifications are important for their business.
A predominance of long-term orientation of the international transactions' exchanges within the cereals, meat, fruit and vegetables and olive oil sectors has been observed. An explanation for this could be the fact that the long-term orientation facilitates businesses to create a trustworthy legal basis for planning and securing future supplies or sales. While spot markets are often to be found in the cereal chain, in the fruit and vegetables chains only well-known and trusted businesses are dealt with. In general, the arrangement of formal contracts is preferred by most of the interviewed enterprises and the duration varies between 6 months and longer than 24 months. In addition, regulations relating to food quality and safety are required overall. The certification's orientation on the international transactions also proved to be a determinant for carrying out an external trade. The findings from the obtained results suggest that the request of the agri-food enterprises for more personal relations explains their need for trusted exchanges.
The objective of the *third research steps* (see ***Chapter 6)*** has been to analyse trust-building factors in the traditional transactions from the buyer's site. Trust can reduce transaction costs, and the trust in B2B relationships can be separated and grouped into specific trust-building elements based on the literature research (see ***Chapter 3***). The key players in the agri-food sectors have been interviewed to evaluate priority of trust-building elements by using the AHP which appertains to the decision support system. The first transaction has been the subject of this analysis because trust has not yet been established. The evaluation has been conducted in several European and cross-border countries, which have already been studied in the previous analyses.

The results of this assessment have shown first that there are some specific trust-building elements of higher importance. Some elements influence the trade exchanges with a new supplier more than others, and their nature depends on the specific culture. The obtained findings are:

- trust-building elements which are of higher importance or influence than others, e.g. “price / performance”, “ specification” and “realibity of the seller”;
- trust-building elements which imply a control action like “product certification” and “inspection” and business success factors like a good “price / performance” as well as a good product “specification”;
- trust-building elements with respect to the relationships with others like seller or third parties, e.g. “reputation of the seller”, “reputation of the product”, the “relationship with the seller”, seem to be of lower importance for conducting a transaction with a new supplier.

Based on the determination that the cultural background can have a significant influence on the formation of trust, the results from the different countries have been compared. An obvious difference between northern and southern countries has been identified. German business managers are classified as being focused on provable facts and control. The conclusion could be drawn that the cultural aspect of trust generation might be in evidence here.

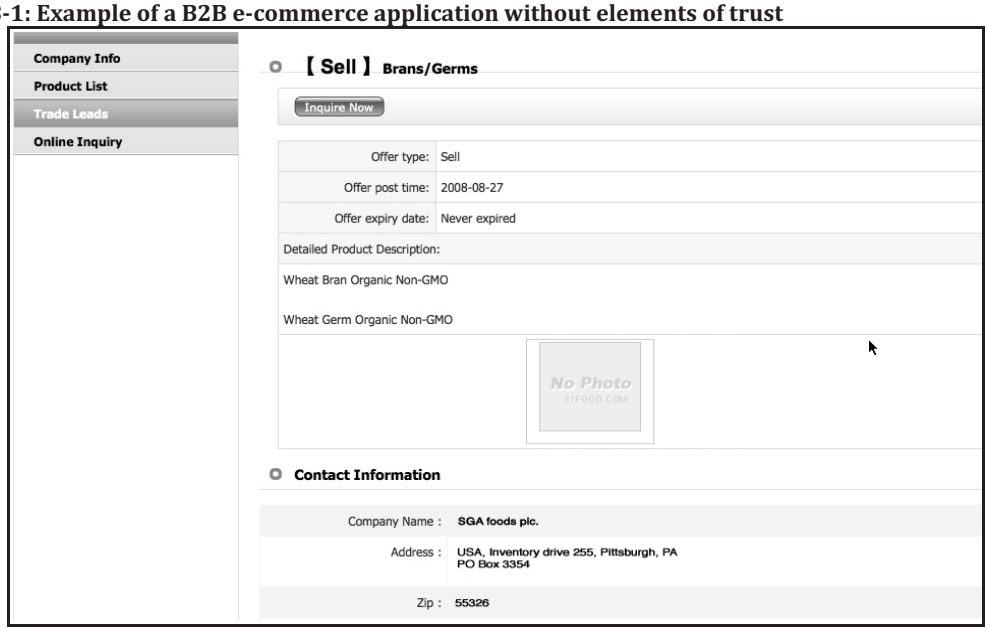
The *last reseach step* has been the development of applications for e-commerce which support trust creation and are transferred from the obtained traditional trust elements in Chapter 6 (see ***Chapter 7***). Overall, it is shown that e-commerce and its technologies have a high potential to create an initial trust relationship (see ***Chapter 2***). Even when suppliers address a variety of customer needs, they do not yet overcome the trust barrier resulting from an absent face-to-face interaction. Therefore, suppliers have to promote the usage of synchronous audio-visual communication tools more intensively towards the trade exchange (HAAS ET AL. 2009b). The developed trust elements typology and the gained assessment of its importance should be used as a guideline to implement electronic trust elements into B2B e-commerce applications.

With the help of such technical features, suppliers can concentrate the important e-commerce related issues, so that the buyer can find this information at one glance. The supplier’s communicated commitment will significantly affect the trust building on the buyer side, i.e. explicitly communicating trustworthiness in applications can increase the growth of e-commerce. Meeting these applications is too tall an order for a SME. So a different organisational model will probably have to be adopted, with dedicated organisations running e-commerce and SMEs acting as users (HAAS ET AL. 2009b).

The obtained results give a picture of what can be done to increase trustworthiness via B2B applications: quality management certificates, specifications and warranties or a tracking system seem to be much better suitable compared to product pictures or market information. The signals tested in this regard are especially suitable to facilitate a first contact; but also the probability to even buy a product should be higher if the proper signals are delivered (HAAS ET AL. 2009). The following figures show an example of a B2B e-commerce application containing

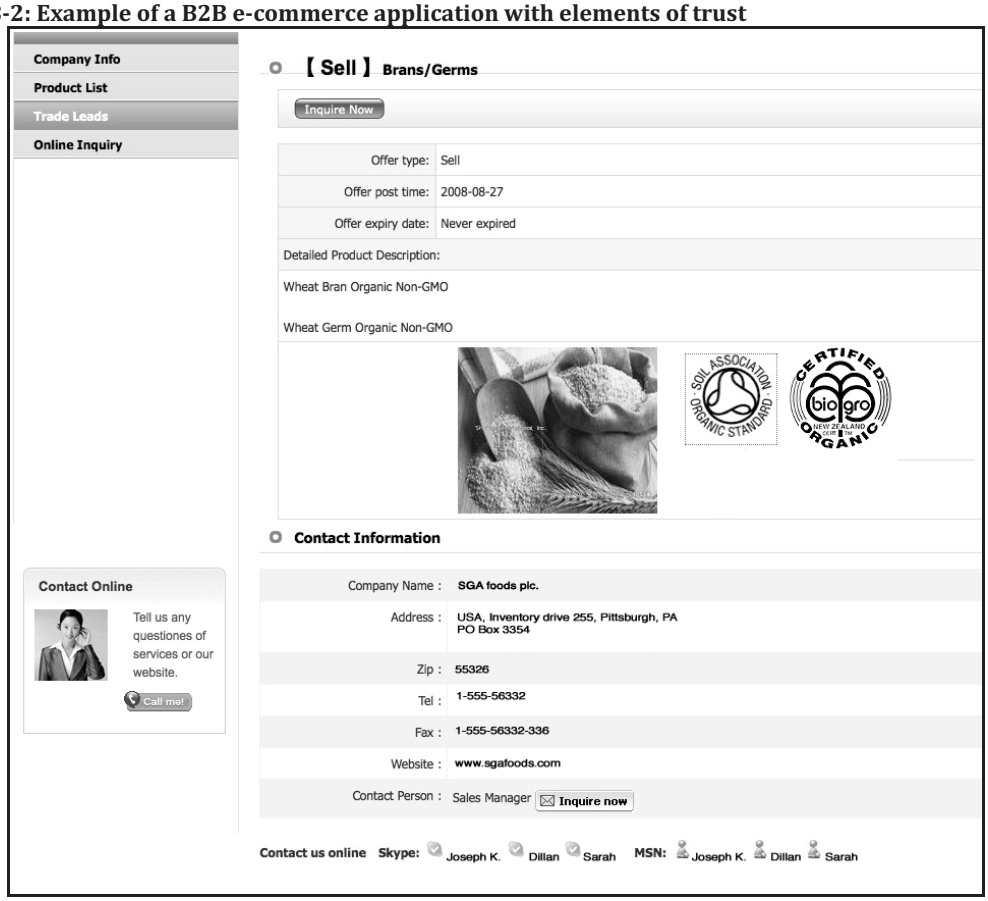
only minimum information about the product/company (Figure 8-1) and a modification of the page with respect to the obtained findings (Figure 8-2).

Figure 8-1: Example of a B2B e-commerce application without elements of trust



Source: Haas et al. 2009b

Figure 8-2: Example of a B2B e-commerce application with elements of trust



Source: Haas et al. 2009b

Furthermore, measuring the importance of trust elements revealed that both product-related trust elements and seller-related trust elements have to be esteemed. A further analysis of the importance of trust elements in e-commerce with respect to the cultural background of the traders has showed that there are two prevailing groups of countries: product-oriented and relationship-oriented countries. Successful e-commerce applications have to consider the cultural diversity in Europe.

Proposals and first indications for trustworthiness in B2B e-commerce as described in this thesis can be helpful within the traditional way of food transactions as a facilitator for food traders by accelerating the identification of new suitable suppliers. The result is that transactions can be handled with higher economic efficiency. In particular, surveying larger samples in order to re-evaluate the more or less qualitative results of this thesis could be beneficial. The major validity of the generalized results can be widely guaranteed as the analysis within this thesis was developed with the support of a stepwise approach and the related results are moving towards a "mainstream" conclusion. However, a further in-depth analysis could help find more arguments for the use of electronic features in the agri-food supply networks as well.

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APPENDIXES

Appendix 1: Quality signs in European food chains

Country	Chain level	Beef	Pork	Poultry	Grain	Fruits	Vegetables	Olive oil
Austria	Farmer - Ind	Agrarmarkt Austria: www.ama.at; ISO 9000: www.iso.org	Agrarmarkt Austria: www.ama.at; ISO 9000: www.iso.org	Agrarmarkt Austria: www.ama.at; ISO 9000: www.iso.org	Agrarmarkt Austria: www.ama.at; ISO 9000: www.iso.org	Agrarmarkt Austria: www.ama.at; EurepGAP: www.eurep.org; ISO 9000: www.iso.org	Agrarmarkt Austria: www.ama.at; EurepGAP: www.eurep.org; ISO 9000: www.iso.org	
	Ind - Retail	Agrarmarkt Austria: www.ama.at; ISO 9000; ISO 22000: www.iso.org; HACCP	Agrarmarkt Austria: www.ama.at; ISO 9000; ISO 22000: www.iso.org; HACCP	Agrarmarkt Austria: www.ama.at; ISO 9000; ISO 22000: www.iso.org; HACCP	Agrarmarkt Austria (e.g. Pastus): www.ama.at; ISO 9000; ISO 22000: www.iso.org; HACCP	Agrarmarkt Austria: www.ama.at; ISO 9000; ISO 22000: www.iso.org; HACCP	Agrarmarkt Austria: www.ama.at; ISO 9000; ISO 22000: www.iso.org; HACCP	
Belgium	Farmer - Ind	Meritus: www.belgianmeat.be; ISO 9000: www.iso.org	Certus: www.belgianmeat.be; ISO 9000: www.iso.org	ISO 9000: www.iso.org	Good manufacturing practice: www.ovocom.be; ISO 9000: www.iso.org	Flandria: www.flandria.vlam.be; EurepGAP: www.eurep.org; ISO 9000: www.iso.org	Flandria: www.flandria.vlam.be; EurepGAP: www.eurep.org; ISO 9000: www.iso.org	
	Ind - Retail	Meritus: www.belgianmeat.be; ISO 9000; ISO 22000: www.iso.org; HACCP	Certus: www.belgianmeat.be; ISO 9000; ISO 22000: www.iso.org; HACCP	ISO 9000; ISO 22000: www.iso.org; HACCP	ISO 9000; ISO 22000: www.iso.org; HACCP	ISO 9000; ISO 22000: www.iso.org; HACCP	ISO 9000; ISO 22000: www.iso.org; HACCP	
Denmark	Farmer - Ind	Dansk Kalv: www.danskkalv.dk; Global Red Meat Standard; www.grms.org; ISO 9000: www.iso.org	Danish Quality Guarantee: www.danskeslagterier.dk; Global Red Meat Standard; www.grms.org; ISO 9000: www.iso.org	ISO 9000: www.iso.org	ISO 9000: www.iso.org	EurepGAP: www.eurep.org; ISO 9000: www.iso.org	EurepGAP: www.eurep.org; ISO 9000: www.iso.org	
	Ind - Retail	ISO 9000; ISO 22000: www.iso.org; HACCP	Danish Quality Guarantee: www.danskeslagterier.dk; ISO 9000; ISO 22000: www.iso.org; HACCP	ISO 9000; ISO 22000: www.iso.org; HACCP	ISO 9000; ISO 22000: www.iso.org; HACCP	ISO 9000; ISO 22000: www.iso.org; HACCP	ISO 9000; ISO 22000: www.iso.org; HACCP	

Country	Chain level	Beef	Pork	Poultry	Grain	Fruits	Vegetables	Olive oil
France	Farmer - Ind	Label Rouge: www.label-rouge.org; Agriculture Raisonnee: www.farre.org; Agriculture confiance: http://cfca.magnitsite.net/sites/cfca; ISO 9000: www.iso.org	Label Rouge: www.label-rouge.org; Agriculture Raisonnee: www.farre.org; Agriculture confiance: http://cfca.magnitsite.net/sites/cfca; International Food Standard: www.food-care.info; ISO 9000: www.iso.org	Label Rouge: www.label-rouge.org; Agriculture Raisonnee: www.farre.org; Agriculture confiance: http://cfca.magnitsite.net/sites/cfca; International Food Standard: www.food-care.info; ISO 9000: www.iso.org	Agriculture Raisonnee: www.farre.org; Agriculture confiance: http://cfca.magnitsite.net/sites/cfca; ISO 9000: www.iso.org	Label Rouge: www.label-rouge.org; Agriculture Raisonnee: www.farre.org; Agriculture confiance: http://cfca.magnitsite.net/sites/cfca; ISO 9000: www.iso.org	Label Rouge: www.label-rouge.org; Agriculture Raisonnee: www.farre.org; Agriculture confiance: http://cfca.magnitsite.net/sites/cfca; ISO 9000: www.iso.org	EurepGAP: www.eurep.org (only for olives); ISO 9000: www.iso.org
	Ind - Retail	Label Rouge: www.label-rouge.org; International Food Standard: www.food-care.info; ISO 9000; ISO 22000: www.iso.org; HACCP	Label Rouge: www.label-rouge.org; International Food Standard: www.food-care.info; ISO 9000; ISO 22000: www.iso.org; HACCP	Label Rouge: www.label-rouge.org; International Food Standard: www.food-care.info; ISO 9000; ISO 22000: www.iso.org; HACCP	IFIS: www.fefac.org/file.pdf?FileID=633; ISO 9000; ISO 22000: www.iso.org; HACCP	Label Rouge: www.label-rouge.org; International Food Standard: www.food-care.info; ISO 9000; ISO 22000: www.iso.org; HACCP	Label Rouge: www.label-rouge.org; International Food Standard: www.food-care.info; ISO 9000; ISO 22000: www.iso.org; HACCP	ISO 9000; ISO 22000: www.iso.org; HACCP

Country	Chain level	Beef	Pork	Poultry	Grain	Fruits	Vegetables	Olive oil
Germany	Farmer - Ind	Q+S: www.q-s.info; ISO 9000: www.iso.org	Q+S: www.q-s.info; ISO 9000: www.iso.org	Q+S: www.q-s.info; ISO 9000: www.iso.org	EurepGAP: www.eurep.org ; Q+S: www.q-s.info; Basisquality / Management: www.gubb-halle.de; ISO 9000: www.iso.org; GMP 06: www.pdv.nl	Q+S: www.q-s.info; EurepGAP: www.eurep.org; ISO 9000: www.iso.org	Q+S: www.q-s.info; EurepGAP: www.eurep.org ; ISO 9000: www.iso.org	
	Ind - Retail	Q+S: www.q-s.info; International Food Standard: www.food-care.info; British Retailer Consortium: www.brc.org; ISO 9000; ISO 22000: www.iso.org; HACCP	Q+S: www.q-s.info; International Food Standard: www.food-care.info; British Retailer Consortium: www.brc.org; ISO 9000; ISO 22000: www.iso.org; HACCP	Q+S: www.q-s.info; IFS: www.food-care.info; BRC: www.brc.org; ISO 9000; ISO 22000: www.iso.org; HACCP	EurepGAP: www.eurep.org ; Q+S: www.q-s.info; ISO 9000; ISO 22000: www.iso.org; GMP 02: www.pdv.nl	Q+S: www.q-s.info; International Food Standard: www.food-care.info; British Retailer Consortium: www.brc.org; ISO 9000; ISO 22000: www.iso.org; HACCP	Q+S: www.q-s.info; International Food Standard: www.food-care.info; British Retailer Consortium: www.brc.org; ISO 9000; ISO 22000: www.iso.org; HACCP	
Great Britain	Farmer - Ind	Assured British Meat: www.abm.org/uk/abm/; Genesis: www.littleredtractor.org.uk; FAWL: www.littleredtractor.org.uk; ISO 9000: www.iso.org	Assured British Meat: www.abm.org/uk/abm/; FAWL: www.littleredtractor.org.uk; ISO 9000: www.iso.org	Assured chicken production – ACP: www.littleredtractor.org.uk; ISO 9000: www.iso.org	Assured combinable crops: www.littleredtractor.org.uk; Scottish quality cereals scheme: www.littleredtractor.org.uk; Northern Ireland Farm Assurance sereals scheme: www.littleredtractor.org.uk; Genesis cereals assurance scheme: www.littleredtractor.org.uk	Assured Produce: www.assuredproduce.co.uk; EurepGAP: www.eurep.org; ISO 9000: www.iso.org	Assured Produce: www.assuredproduce.co.uk; EurepGAP: www.eurep.org ; ISO 9000: www.iso.org	
	Ind - Retail	British Retailer Consortium: www.brc.org; European Food Safety Inspection Service: www.efsis.com; ISO 9000; ISO 22000: www.iso.org; HACCP	British Retailer Consortium: www.brc.org; European Food Safety Inspection Service: www.efsis.com; ISO 9000; ISO 22000: www.iso.org; HACCP	British Retailer Consortium: www.brc.org; European Food Safety Inspection Service: www.efsis.com; ISO 9000; ISO 22000: www.iso.org; HACCP	British Retailer Consortium: www.brc.org; European Food Safety Inspection Service: www.efsis.com; ISO 9000; ISO 22000: www.iso.org; HACCP	British Retailer Consortium: www.brc.org; European Food Safety Inspection Service: www.efsis.com; ISO 9000; ISO 22000: www.iso.org; HACCP	British Retailer Consortium: www.brc.org; European Food Safety Inspection Service: www.efsis.com ; ISO 9000; ISO 22000: www.iso.org; HACCP	

Country	Chain level	Beef	Pork	Poultry	Grain	Fruits	Vegetables	Olive oil
Greece	Farmer - Ind	ELOT 1416 (Organization for Standardization): www.elot.gr; AGRO 3-1 & 3-2 & 3-3 & 3-4 (public certification authority): www.agrocert.gr; Q+S: www.q-s.info; EurepGAP: www.eurep.org ; ISO 9000: www.iso.org	ELOT 1416 (Organization for Standardization): www.elot.gr; AGRO 3-1 & 3-2 & 3-3 & 3-4 (public certification authority): www.agrocert.gr; Q+S: www.q-s.info; EurepGAP: www.eurep.org; ISO 9000: www.iso.org	ELOT 1416 (Organization for Standardization): www.elot.gr; AGRO 3-1 & 3-2 & 3-3 & 3-4 (public certification authority): www.agrocert.gr; Q+S: www.q-s.info; EurepGAP: www.eurep.org; ISO 9000: www.iso.org	ELOT 1416 (Organization for Standardization): www.elot.gr; AGRO 3-1 & 3-2 & 3-3 & 3-4 (public certification authority): www.agrocert.gr; Q+S: www.q-s.info; EurepGAP: www.eurep.org ; ISO 9000: www.iso.org	ELOT 1416 (Organization for Standardization): www.elot.gr; AGRO 3-1 & 3-2 & 3-3 & 3-4 (public certification authority): www.agrocert.gr; Q+S: www.q-s.info; EurepGAP: www.eurep.org; ISO 9000: www.iso.org	ELOT 1416 (Organization for Standardization): www.elot.gr; AGRO 3-1 & 3-2 & 3-3 & 3-4 (public certification authority): www.agrocert.gr; Q+S: www.q-s.info; EurepGAP: www.eurep.org ; ISO 9000: www.iso.org	ELOT 1416 (Organization for Standardization): www.elot.gr; AGRO 3-1 & 3-2 & 3-3 & 3-4 (public certification authority): www.agrocert.gr; Q+S: www.q-s.info; EurepGAP: www.eurep.org; ISO 9000: www.iso.org
	Ind - Retail	ELOT 1416 (Organization for Standardization): www.elot.gr; AGRO 3-1 & 3-2 & 3-3 & 3-4 (public certification authority): www.agrocert.gr; Q+S: www.q-s.info; ISO 9000; ISO 22000: www.iso.org; HACCP	ELOT 1416 (Organization for Standardization): www.elot.gr; AGRO 3-1 & 3-2 & 3-3 & 3-4 (public certification authority): www.agrocert.gr; Q+S: www.q-s.info; ISO 9000; ISO 22000: www.iso.org; HACCP	ELOT 1416 (Organization for Standardization): www.elot.gr; AGRO 3-1 & 3-2 & 3-3 & 3-4 (public certification authority): www.agrocert.gr; Q+S: www.q-s.info; ISO 9000; ISO 22000: www.iso.org; HACCP	ELOT 1416 (Organization for Standardization): www.elot.gr; AGRO 3-1 & 3-2 & 3-3 & 3-4 (public certification authority): www.agrocert.gr; Q+S: www.q-s.info; ISO 9000; ISO 22000: www.iso.org; HACCP	ELOT 1416 (Organization for Standardization): www.elot.gr; AGRO 3-1 & 3-2 & 3-3 & 3-4 (public certification authority): www.agrocert.gr; Q+S: www.q-s.info; International Food Standard: www.food-care.info; British Retailer Consortium: www.brc.org; ISO 9000	ELOT 1416 (Organization for Standardization): www.elot.gr; AGRO 3-1 & 3-2 & 3-3 & 3-4 (public certification authority): www.agrocert.gr; Q+S: www.q-s.info; International Food Standard: www.food-care.info; British Retailer Consortium: www.brc.org; ISO 9000	ELOT 1416 (Organization for Standardization): www.elot.gr; AGRO 3-1 & 3-2 & 3-3 & 3-4 (public certification authority): www.agrocert.gr; Q+S: www.q-s.info; ISO 9000; ISO 22000: www.iso.org; HACCP

Country	Chain level	Beef	Pork	Poultry	Grain	Fruits	Vegetables	Olive oil
Italy	Farmer - Ind	Specific are the regional quality programs about the origin. Protection levels in Europe: Protected Denomination of Origin (P.D.O.); Protected Geographical Indication (P.G.I.); Tradicional Guaranteed Speciality (T.G.S.); ISO 9000: www.iso.org	Specific are the regional quality programs about the origin. Protection levels in Europe: Protected Denominatio n of Origin (P.D.O.); Protected Geographica l Indication (P.G.I.); Tradicional Guaranteed Speciality (T.G.S.); ISO 9000: www.iso.org	Specific are the regional quality programs about the origin. Protection levels in Europe: Protected Denomina tion of Origin (P.D.O.); Protected Geographi cal Indication (P.G.I.); Tradiciona l Guarantee d Speciality (T.G.S.); ISO 9000: www.iso.o rg	Specific are the regional quality programs about the origin. Protection levels in Europe: Protected Denomination of Origin (P.D.O.); Protected Geographical Indication (P.G.I.); Tradicional Guaranteed Speciality (T.G.S.); ISO 9000: www.iso.org	EurepGAP: www.eurep.o rg; ISO 9000: www.iso.org	EurepGAP: www.eurep.org ; ISO 9000: www.iso.org	EurepGAP: www.eurep.o rg (only for olives); ISO 9000: www.iso.or g
	Ind - Retail	ISO 9000; ISO 22000: www.iso.org; HACCP	ISO 9000; ISO 22000: www.iso.org; HACCP	ISO 9000; ISO 22000: www.iso.o rg; HACCP	ISO 9000; ISO 22000: www.iso.org; HACCP	ISO 9000; ISO 22000: www.iso.org; HACCP	ISO 9000; ISO 22000: www.iso.org; HACCP	ISO 9000; ISO 22000: www.iso.org; HACCP
Nether-lands	Farmer - Ind	IKB: www.hollandm eat.nl; www.pve.nl; SGF 1000: www.sqfi.com; ISO 9000: www.iso.org	IKB: www.holland meat.nl; www.pve.nl; SGF 1000: www.sqfi.co m; ISO 9000: www.iso.org	IKB: www.holla ndmeat.nl; www.pve. nl; SGF 1000: www.sqfi. com; ISO 9000: www.iso.o rg	SGF 1000: www.sqfi.com; Good manufacturing practice B06: www.pve.nl; ISO 9000: www.iso.org	SGF 1000: www.sqfi.co m; CentralBure auLevensmit telhandel – CBL-BRC: www.cbl.nl; ISO 9000: www.iso.org	SGF 1000: www.sqfi.com; CentralBureau Levensmittelha ndel – CBL-BRC: www.cbl.nl; ISO 9000: www.iso.org	
	Ind - Retail	IKB: www.hollandm eat.nl; www.pve.nl; SGF 2000: www.sqfi.com; British Retailer Consortium: www.brc.org; ISO 9000; ISO 22000: www.iso.org; HACCP	IKB: www.holland meat.nl; www.pve.nl; SGF 2000: www.sqfi.co m; British Retailer Consortium: www.brc.org; ISO 9000; ISO 22000: www.iso.org; HACCP	IKB: www.holla ndmeat.nl; www.pve. nl; SGF 2000: www.sqfi. com; British Retailer Consortiu m: www.brc.o rg; ISO 9000; ISO 22000: www.iso.o rg; HACCP	SGF 2000: www.sqfi.com; Good manufacturing practice B02 (for Importer); Good manufacturing B01: www.pdv.nl; ISO 9000; ISO 22000: www.iso.org; HACCP	SGF 2000: www.sqfi.co m; British Retailer Consortium: www.brc.org; European Food Safety Inspection Service: www.efsis.co m; ISO 9000; ISO 22000: www.iso.org; HACCP	SGF 2000: www.sqfi.com; British Retailer Consortium: www.brc.org; European Food Safety Inspection Service: www.efsis.com ; ISO 9000; ISO 22000: www.iso.org; HACCP	
Slovenia	Farmer - Ind	HACCP	HACCP	HACCP	HACCP	HACCP	HACCP	
	Ind - Retail	HACCP	HACCP	HACCP	HACCP	HACCP	HACCP	

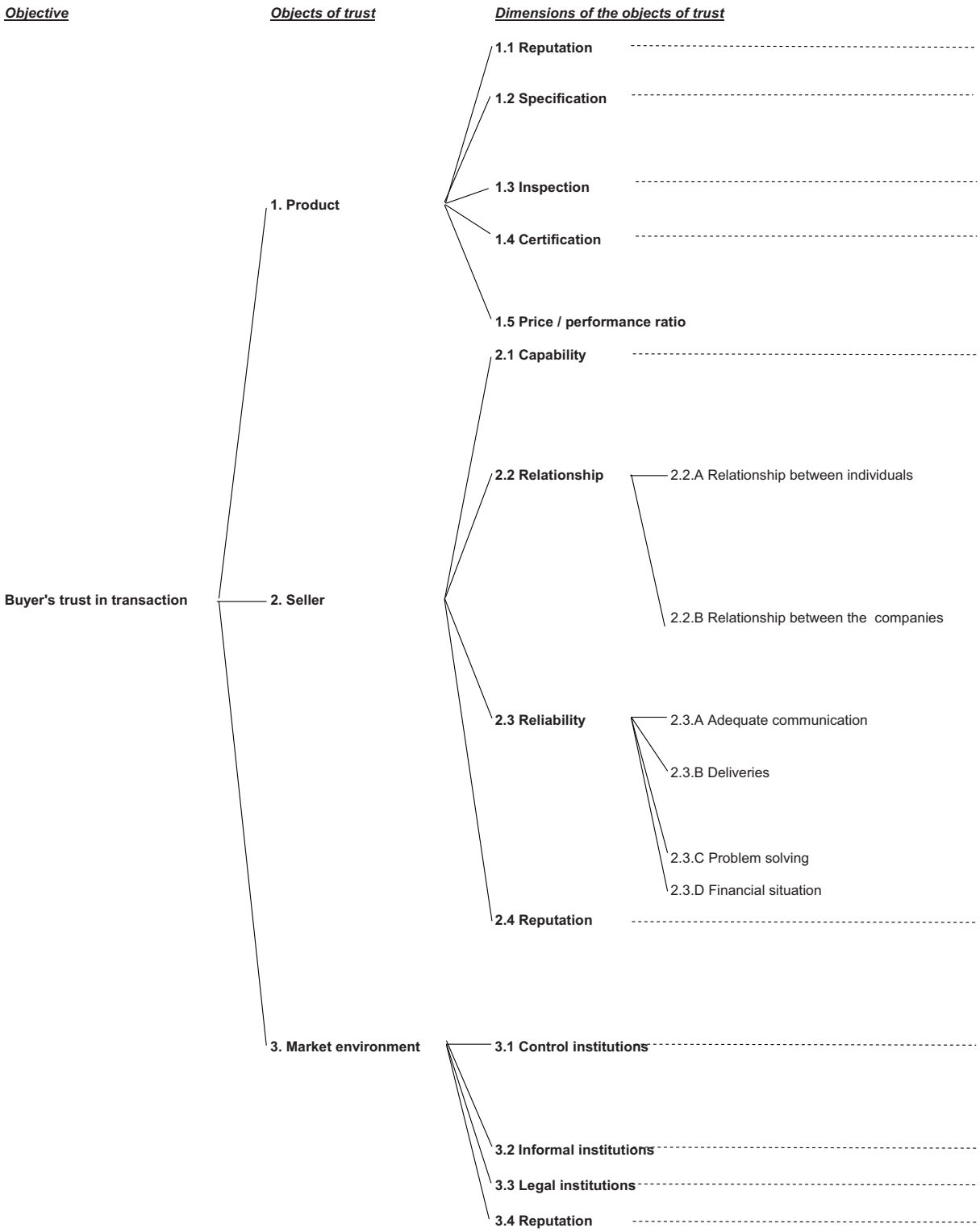
Country	Chain level	Beef	Pork	Poultry	Grain	Fruits	Vegetables	Olive oil
Spain: the regional quality programs are specific about the origin. Protection levels in Europe: Protected Denomi-nation of Origin (P.D.O.); Protected Geo-graphical Indication (P.G.I.); Traditional Guaran-teed Speciality (T.G.S.)	Farmer - Ind	ENAC (National Accreditation Body, but regulated by Ministry of Science and Technology): www.enac.es; I.G.P. Ternera Gallega: www.terneragallega.com; I.G.P. Carne de avila: www.carnedeavila.org; ISO 9000: www.iso.org	ENAC (National Accreditation Body, but regulated by Ministry of Science and Technology): www.enac.es; ISO 9000: www.iso.org	ENAC (National Accreditation Body, but regulated by Ministry of Science and Technology): www.enac.es; ISO 9000: www.iso.org	ENAC (National Accreditation Body, but regulated by Ministry of Science and Technology): www.enac.es; ISO 9000: www.iso.org	ENAC (National Accreditation Body, but regulated by Ministry of Science and Technology): www.enac.es; Q+S: www.q-s.info; ISO 9000: www.iso.org; HACCP	ENAC (National Accreditation Body, but regulated by Ministry of Science and Technology): www.enac.es; Q+S: www.q-s.info; ISO 9000: www.iso.org; HACCP	EurepGAP: www.eurep.org; ENAC (National Accreditation Body, but regulated by Ministry of Science and Technology): www.enac.es; http://www.oliveoilfromspain.com/Oliveoilfs/everything/denominations_of_origins.asp; Les Garrigues http://www.olidoplesgar
	Ind - Retail	ENAC (National Accreditation Body, but regulated by Ministry of Science and Technology): www.enac.es; I.G.P. Ternera Gallega: www.terneragallega.com; I.G.P. Carne de avila: www.carnedeavila.org; ISO 9000; ISO 22000: www.iso.org; HACCP	ENAC (National Accreditation Body, but regulated by Ministry of Science and Technology): www.enac.es; ISO 9000; ISO 22000: www.iso.org; HACCP	ENAC (National Accreditation Body, but regulated by Ministry of Science and Technology): www.enac.es; ISO 9000; ISO 22000: www.iso.org; HACCP	ENAC (National Accreditation Body, but regulated by Ministry of Science and Technology): www.enac.es; ISO 9000; ISO 22000: www.iso.org; HACCP	ENAC (National Accreditation Body, but regulated by Ministry of Science and Technology): www.enac.es; Q+S: www.q-s.info; ISO 9000; ISO 22000: www.iso.org; HACCP	ENAC (National Accreditation Body, but regulated by Ministry of Science and Technology): www.enac.es; Q+S: www.q-s.info; ISO 9000; ISO 22000: www.iso.org; HACCP	ENAC (National Accreditation Body, but regulated by Ministry of Science and Technology): www.enac.es; http://www.oliveoilfromspain.com/Oliveoilfs/everything/denominations_of_origins.asp; Les Garrigues http://www.olidoplesgarrigues.com; ISO 9000; ISO

Country	Chain level	Beef	Pork	Poultry	Grain	Fruits	Vegetables	Olive oil
Sweden	Farmer - Ind	Swedish Meats – (Scan AB): http://www.swedishmeats.com; ISO 9000: www.iso.org	ISO 9000: www.iso.org	Svensk fågel (Swedish poultry meat association): www.svenskfagel.se; ISO 9000: www.iso.org	Swedish Seal: www.svensktsigill.com; ISO 9000: www.iso.org	Swedish Seal: www.svensktsigill.com; ISO 9000: www.iso.org	Swedish Seal: www.svensktsigill.com; ISO 9000: www.iso.org	
	Ind - Retail	Swedish Meats – (Scan AB): http://www.swedishmeats.com; ISO 9000; ISO 22000: www.iso.org; HACCP	ISO 9000; ISO 22000: www.iso.org; HACCP	Svensk fågel (Swedish poultry meat association): www.svenskfagel.se; ISO 9000; ISO 22000: www.iso.org; HACCP	ISO 9000; ISO 22000: www.iso.org; HACCP	ISO 9000; ISO 22000: www.iso.org; HACCP	ISO 9000; ISO 22000: www.iso.org; HACCP	
Turkey	Farmer - Ind	TFC (Turkish Food Codex); HACCP, GMP, Q+S, GHP, TSE (Turkish Standards Institute): www.kkgm.gov.tr; www.tse.org.tr		TFC (Turkish Food Codex); HACCP, GMP, Q+S, GHP, TSE (Turkish Standards Institute): www.kkgm.gov.tr; www.tse.org.tr	TFC (Turkish Food Codex); HACCP, GMP, Q+S, GHP, TSE (Turkish Standards Institute): www.kkgm.gov.tr; www.tse.org.tr	TFC (Turkish Food Codex): www.kkgm.gov.tr	TFC (Turkish Food Codex): www.kkgm.gov.tr	TFC (Turkish Food Codex); HACCP, GMP, Q+S, GHP, TSE (Turkish Standards Institute): www.kkgm.gov.tr; www.tse.org.tr
	Ind - Retail	TFC (Turkish Food Codex); HACCP, GMP, Q+S, GHP, TSE (Turkish Standards Institute): www.kkgm.gov.tr; www.tse.org.tr		TFC (Turkish Food Codex); HACCP, GMP, Q+S, GHP, TSE (Turkish Standards Institute): www.kkgm.gov.tr; www.tse.org.tr	TFC (Turkish Food Codex); HACCP, GMP, Q+S, GHP, TSE (Turkish Standards Institute): www.kkgm.gov.tr; www.tse.org.tr	TFC (Turkish Food Codex): www.kkgm.gov.tr	TFC (Turkish Food Codex): www.kkgm.gov.tr	TFC (Turkish Food Codex); HACCP, GMP, Q+S, GHP, TSE (Turkish Standards Institute): www.kkgm.gov.tr; www.tse.org.tr

Country	Chain level	Beef	Pork	Poultry	Grain	Fruits	Vegetables	Olive oil
USA	Farmer - Ind	Beef Assurance Programm – Cow-Calf Quality Assurance Program-- national states programs	Pork Quality Assurance Program (PQA, for the complete chain): http://www.porkboard.org/PQA/manualHome.asp		Bakers Quality Seal: http://www.aibinternational.com/	Country of Origin labeling (COOL); ProSafe Certified: http://www.davisfreshtech.com; Quality Assurance Program (QAP – for strawberry); Almond Board of California's Food Quality and Safety Program (FQSP): http://www.almondsarein.com/	Country of Origin labeling (COOL); ProSafe Certified: http://www.davisfreshtech.com/	
	Ind - Retail	Beef Assurance Programm – Cow-Calf Quality Assurance Program-- national states programs; HACCP	Pork Quality Assuranse Program (PQA, for the complete chain): http://www.porkboard.org/PQA/manualHome.asp; HACCP	HACCP	HACCP	ProSafe Certified: http://www.davisfreshtech.com; Almond Board of California's Food Quality and Safety Program (FQSP): http://www.almondsarein.com; HACCP	ProSafe Certified: http://www.davisfreshtech.com; HACCP	

Source: Hofstede et al. 2007

Appendix 2: Trust's elements typology



Dimensions of the objects of trust		***Sources of trust (intrinsic and enforced, new partners)***
1.1 Reputation		1.1.1 Intrinsic qualities (e.g. taste)
		1.1.2 Trade brand of the product
		1.1.3 Region of origin
1.2 Specification		1.2.1 Product specification as agreed
		1.2.2 Statement that product complies with legal requirements
		1.2.3 Product safety warranty
		1.2.4 Production process specification
		1.2.5 Specification of origin of raw material
1.3 Inspection		1.3.1 Physical examination of product
		1.3.2 Laboratory analysis of product sample
		1.3.3 Visit to production site
1.4 Certification		1.4.1 Sector specific quality or hygiene code
		1.4.2 HACCP or ISO 9000 of original producer
		1.4.3 Eurepgap, brc, ifs, gmp+
		1.4.4 Regional origin (AOC) label
		1.4.5 Corporate Social Responsibility label
1.5 Price / performance ratio		
2.1 Capability		2.1.1 Company's information on tracking and tracing
		2.1.2 Company's information on production capacity
		2.1.3 Company's information on communication and services
		2.1.4 A visit to the production site/ his company
		2.1.5 An audit to see if the supplier meets all our standards
		2.1.6 Company is ISO 9000 certified
		2.1.7 Company complies with sector standard
2.2 Relationship	2.2.A between individuals	2.2.A.1 Partner and I share the same philosophy of life
		2.2.A.2 Partner is kind
		2.2.A.3 Impression that partner will be flexible
		2.2.A.4 We share the same language
		2.2.A.5 Know the partner already through my professional network
		2.2.A.6 Know the partner already through mutual friends / family
		2.2.A.7 The partner is family
		2.2.A.8 The partner is a friend
	2.2.B between companies	2.2.B.1 Partner and I share a common work philosophy
		2.2.B.2 Partner and I share a common interest in a long term relationship
		2.2.B.3 Partner and I develop common rules for coordination
		2.2.B.4 Partner accepts that transaction rules are set out by me
		2.2.B.5 Assessment of partner's growth potential
		2.2.B.6 Partner is willing to invest in the relationship
		2.2.B.7 Partner is prepared to bargain
2.3 Reliability	2.3.A Adequate communication	2.3.A.1 Partner responds on time
		2.3.A.2 Important matters are actively communicated
		2.3.A.3 Partner responds adequately
	2.3.B Deliveries	2.3.B.1 Impression that the partner is honest
		2.3.B.2 Oral agreement
		2.3.B.3 Partner is willing to draw up a contract
		2.3.B.4 Logistics warranty
		2.3.B.5 Partner is willing to be closely monitored
	2.3.C Problem solving	2.3.C.1 Partner thinks ahead with us to avoid problems
		2.3.C.2 Partner is competent in solving problems
	2.3.D Financial situation	2.3.D.1 The financial report of the seller
		2.3.D.2 A financial audit on the seller
2.4 Reputation		2.4.1 Official recommendation by a public institution
		2.4.2 Official recommendation by an industry association
		2.4.3 Official recommendation by purchasing organisations
		2.4.4 Informal recommendation by someone I know
		2.4.5 Informal recommendation by a superior
		2.4.6 Partner is member of branch- or professional association
		2.4.7 Reputation of partner in my network
3.1 Control institutions		3.1.1 Knowledge of checking personell
		3.1.2 Strictness of checking process
		3.1.3 Test criteria
		3.1.4 Acknowledgement by business partner
		3.1.5 Dissemination of the quality sign
		3.1.6 Accreditation
3.2 Informal institutions		3.2.1 Political stability
		3.2.2 Social control among operators
3.3 Legal institutions		3.3.1 Contract enforcement options
		3.3.2 Food quality and safety level
3.4 Reputation		3.4.1 Enforceability of contracts
		3.4.2. Reliability of operators

Source: Hofstede et al. 2007

Appendix 3: Overview of the assessment in Germany concerning the importance of trust elements

Sector	No. Enterprise	Type of enterprise	Enterprise size (number of employees)	Level in value chain	Primary market	Function of respondent
Grain	1	Cereals Only B2B	Large-scale enterprise 2500 employees	Wholesaler	International	Manager cereal sector
	2	Malt production Only B2B	SME 140 employees	Processor	International	General Manager
	3	Cereals Only B2B	SME 5 employees	Wholesaler	International	General Manager
	4	Fresh pasta Mainly B2C	SME 200 employees	Processor	National	Chief of Purchasing
	5	Beer Mainly B2C	Large-scale enterprise 700 employees	Processor	International	Chief of purchasing
Meat	1	Beef Mainly B2B	SME 8 employees	Wholesaler	National	General manager
	2	Cold meat Mainly B2C	Large-scale-enterprise 1000 employees	Processor	National	Purchasing Manager
	3	All types of meat B2B & B2C	Large-scale-enterprise 2700 employees	Wholesaler	National	Purchasing Manager
	4	All types of meat Only B2B	SME 10 employees	Wholesaler	Regional	General manager
	5	Poultry Only B2B	SME 6 employees	Wholesaler	Regional	General manager
	6	Poultry, Lamb, Beef Mainly B2C	SME 160 employees	Processor	National	Chief of Purchasing
Fruit & vegetable	1	Organic Vegetables & Fruits; B2B	SME 50 employees	Wholesaler	Regional	General manager
	2	Fruits & Vegetables B2B & B2C	SME 60 employees	Wholesaler	Regional	Quality assurance manager
	3	Vegetables & Fruits Only B2B	SME 4 employees	Wholesaler	International	General manager
	4	Fruits & Vegetables Only B2B	SME 70 employees	Wholesaler	Regional	Quality manager
	5	Fruit juice/ smoothies Mainly B2B	SME 15 employees	Processor	National	General manager
	6	Fruits & Vegetables Only B2B	SME 120 employees	Wholesaler	National	Purchase manager
	7	Organic Fruit juice Mainly B2B	SME 110 employees	Processor	National	Chief of Purchasing

Source: Own elaboration

Appendix 4: Direct ranking of trust elements in e-commerce *

* Percentage of selected as being most important for signalizing trustworthiness (n=87 to 89)

QM system certification (31.7%)

Contact info (30.5%)

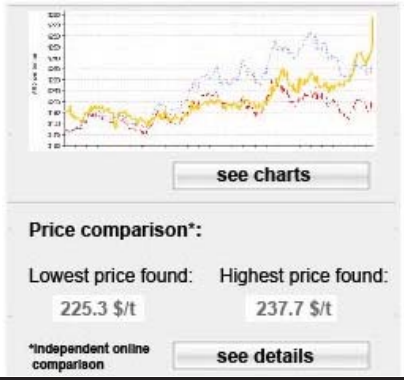
Specification of quality (29.3%)

Product description (28.0%)

Warranties (25.6%)

Reference customers (23.2%)

Price comparison (23.2%)



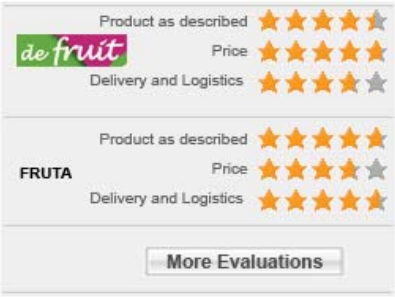
Webcams (22.0%)

Tracking system (20.7%)

Visit of production site (19.5%)

Product pictures (19.5%)

Evaluation (18.3%)



Legal info (15,9%)

Complaint management system (14,6%)

QM Standard (14,6%)

„About us“ (14.6%)

Comments (13.4%)

Country info (13.4%)

Seller evaluation (11.0%)

Image video (8.5%)

Web-blog (4.9%)

Dispute mechanism (3.7%)

Source: Haas et al. 2009b

Appendix 5: Overview of the queried enterprises in Germany concerning trust elements in e-commerce

Sector	No. Enterprise (with respect to Annex 3)	Type of enterprise	Enterprise size (number of employees)	Level in value chain	Primary market	Function of respondent
	2	Malt production Only B2B	SME 140 employees	Processor	International	General Manager
	3	Cereals Only B2B	SME 5 employees	Wholesaler	International	General Manager
	4	Fresh pasta Mainly B2C	SME 200 employees	Processor	National	Chief of Purchasing
	5	Beer Mainly B2C	Large-scale enterprise 700 employees	Processor	International	Chief of purchasing
Meat	**1**	Beef Mainly B2B	SME 8 employees	Wholesaler	National	General manager
	3	All types of meat B2B & B2C	Large-scale enterprise 2700 employees	Wholesaler	National	Purchasing Manager
	New 1	All types of meat B2B & B2C	Large-scale enterprise 300.000 employees worldwide	Wholesaler	International	Purchasing Manager
	New 2	Sausages' delicacy B2B & B2C	SME	Processor	International	General manager
Fruit & vegetable	**1**	Organic Vegetables & Fruits Only B2B	SME 50 employees	Wholesaler	Regional	General manager
	2	Fruits & Vegetables B2B & B2C	SME 60 employees	Wholesaler	Regional	Quality assurance manager
	3	Vegetables & Fruits Only B2B	SME 4 employees	Wholesaler	International	General manager
	6	Fruits & Vegetables Only B2B	SME 120 employees	Wholesaler	National	Purchasing manager

Source: Own elaboration