International Food and Agribusiness Management Review
Volume 11, Issue 2, 2008

Business Relationships and B2B Communication in Selected European Agri-food Chains – First Empirical Evidence[1]

Christian Fischer[Ⓘ] Monika Hartmann[a], Miroslava Bavorova, Heinrich Hockmann [b], Hannele Suvanto, Leena Viitaharju[c], Philip Leat, Cesar Revoredo-Giha[d], Maeve Henchion, Claire McGee[e], Grzegorz Dybowski, Mira Kobuszynska[f]

[a] *Institute for Food and Resource Economics, University of Bonn, Nussallee 21, 53115, Bonn, Germany*
[b] *Institute for Agricultural Development in Central and Eastern Europe (IAMO), Halle, Germany.*
[c] *University of Helsinki Ruralia Institute, Kampusranta 9 FIN-60320 Seinäjoki, Finland.*
[d] *Scottish Agricultural College (SAC), Land Economy Research Group, Ferguson Building, Craibstone Estate, AB21 9YA Aberdeen, United Kingdom.*
[e] *Ashtown Food Research Centre (AFRC), Teagasc, Ashtown, Dublin 15, Ireland.*
[f] *Institute of Agricultural and Food Economics (IAFE), Warsaw, Poland.*

Abstract

The roles of business relationships and B2B communication in selected European agri-food chains are analyzed. Using survey data from 1,026 farmers, food processors and retailers in two commodity sectors (meat and cereals) and five

Ⓘ Corresponding author: Tel: +49-228-73-3582
Email: christian.fischer@ilr.uni-bonn.de
Other contact information:

M. Hartmann: monika.hartmann@ilr.uni-bonn.de; H. Hockmann hockmann@iamo.de,
M. Bavorova bavorova@iamo.de; H.Suvanto hannele.suvanto@helsinki.fi,
L. Viitaharju leena.viitaharju@helsinki.fi; P. Leat Philip.Leat@sac.ac.uk;
C. Revoredo-Giha Cesar.Revoredo@sac.ac.uk; M. Henchion Maeve.Henchion@teagasc.ie
C. McGee Claire.McGee@teagasc.ie G. Dybowski dybowski@ierigz.waw.pl
M. Kobuszynska kobuszynska@ierigz.waw.pl

[1] This publication derives from the research project on 'Key factors influencing economic relationships and communication in European food chains' (FOODCOMM, SSPE-CT-2005-006458) which is funded by the European Commission as part of the Sixth Framework Programme. The collaborating laboratories are: Department of Agricultural and Food Market Research, University of Bonn, Germany (Co-ordinator); Land Economy Research Group, Research & Development Division, Scottish Agricultural College (SAC), Edinburgh, UK; Institute for Agricultural Development in Central and Eastern Europe (IAMO), Germany; The Ashtown Food Research Centre (AFRC), Teagasc, Dublin, Ireland; Ruralia Institute, University of Helsinki, Finland; Institute of Agricultural and Food Economics (IAFE), Poland; and Department of Agricultural Economics, Agri-Food Research and Technology Center (CITA), Spain.

different EU countries (Germany, United Kingdom, Ireland, Finland, Poland), we test the empirical relevance of several theory-based determinants of relationship goodness. This is undertaken for the overall dataset and separately for different supply chain stages (farmer-processor versus the processor-retailer relationship) and for the individual countries. The estimation results, derived from structural equation modeling, suggest that the most important contributor to good business relationships is effective communication, with its two components, adequate communication frequency and high information quality, being equally important. The existence of personal bonds and an equal power distribution between buyers and suppliers are the second most important goodness-of-relationship determinants, while in addition the embeddedness of an agri-food enterprise in the local economy seems to contribute positively to good business relationships. The analysis also reveals that the relative importance of these determinants differs across the two considered stages of supply chain relationships and between the countries investigated. Agri-food business managers seeking to improve their supplier or buyer relationships need to consider the crucial role of effective communication and the positive contribution that the existence of personal bonds can make to the development and maintenance of sustainable relationships.

Keywords: business relationships, B2B communication, agri-food, value/supply chain, structural equation modeling

Introduction

The business environment in which food companies operate is changing. New developments which include globalization, new consumer trends, stricter environmental and food safety regulations, and policy reforms such as the 2003 one of the Common Agricultural Policy (CAP), present challenges and opportunities for all agri-food businesses, from farmers to retailers. In order to meet the challenges and exploit the opportunities, improved supply chain co-ordination is required among farmers, processors and retailers. This can be achieved by the development of sustainable business relationships and by intensifying communication along the chain. Evidence already exists of increased collaboration and bilateral partnerships in agri-food supply chains, but these are occurring slowly and predominantly in multiple retailer-led chains (i.e., the ones which sell a wide variety of food and non-food items and which, due to their bargaining power, control the entry to the chain and the terms and conditions of trading) (Fischer et al., 2007).

Since it is an essential part of business to connect with others (particularly customers, but also other stakeholders such as suppliers, employees, financial analysts and public-sector organizations), building effective relationships and communicating professionally with others are considered key drivers for success and are often at the root of a sustainable competitive advantage. In essence, effective relationships and good communication may:

- help to reduce uncertainty (e.g., through increased information flow leading to improved demand forecasting);
- facilitate better access to crucial resources (e.g., specially formulated ingredients, specialized skills or knowledge); and/or
- result in higher business productivity (e.g., through improved decision making or by enhancing employee loyalty).

Business relationships are defined by Ford et al. (2003) as "the pattern of interactions and mutual conditioning of behavior over time between a company and a customer, a supplier or other organization." Business relationships can be of a competitive, co-operative or command type. Competitive strategies have a zero sum basis: the gain of one partner being at the expense of the other. Co-operative relationships are win-win oriented and can benefit both parties. In this case, frictions are minimized and interdependence between the parties develops. In command relationships, a supplier may make a customer dependent on the offering of unique product or service features. Or such relationships may occur where a customer has superior bargaining power (e.g., resulting from a unique or advantageous access to a particular market). The avoidance of opportunism is the main incentive that governs the choice of a command relationship strategy.

Considerable research effort has been devoted to improving our understanding, and therefore the management, of business relationships (e.g., Bruhn, 2002; Christopher et al., 2002; Cox et al., 2003; Cox, 2004; Crosby et al., 2002; Cuthbertson et al., 2004; Fearne et al., 2001; Ford et al., 2003; Lee et al., 2004; Prahalad et al., 2004). However, to date extensive cross-country research on the role of business relationships and B2B communication in the European agri-food sector has been scarce. While some research has been conducted for individual countries (e.g., Schulze et al., 2006), successful improvement of business relations and communication across the EU agri-food system will depend on a thorough understanding of the current status quo and its key driving forces at a broader level. Without such in-depth assessment of the needs and constraints of the stakeholders involved, considering country-, commodity- and chain stage-specific particularities, no reliable recommendations for either business-strategy formulation or policy-making can be generated. In order to investigate these issues, the EU Commission has commissioned cross-country research, covering several agri-food chains in five geographically dispersed (north, south-west, centre and east) EU countries.

This aticle reports the first empirical findings from the commissioned research project, resulting from testing a set of hypotheses derived from previous analysis, based on both academic studies and knowledge gained from key informants in the sector (see Fischer et al., 2007), which focus on examining the influence of various determinants on 'relationship goodness'.

The article's structure is as follows. After a discussion of the specified research hypotheses, the methodology used for data collection and model estimation are described. Section four presents the obtained results. The last section discusses the findings and draws some conclusions.

Literature review and research hypotheses

Overview over hypotheses

Several theoretical approaches, ranging from socio-economic and institutional economics to business management theories, were investigated while building a theoretical framework for the research behind this paper. They provide evidence that both economic and social relations are considered vital for the success of food supply chains (Hinrichs, 2000; Winter, 2003). The socio-economic and cultural environment in which chain relations are embedded, exerts an important impact on the sustainability of business relationships within the food chain (Hughes, 1996; Ellis and Pecotich, 2001). Market structures and competition forces also influence relationships and the outcomes of agri-food chains (e.g., Mitra, 2000). Communication has been found to be essential for the creation of trust and for supporting sustainable relationships within value chains (e.g., Bruhn, 1999; Greenberg and Grahm, 2000; Chartier and Gabler, 2001). The continuous share of proper, timely and reliable information can generate specific benefits for a whole value/supply chain.

Sustainable business relationships can be characterized as a two-dimensional construct involving the sub-constructs relationship quality and relationship strength (FOODCOMM, 2006). A construct is a concept that describes and includes a number of characteristics or attributes. Constructs are often unobservable ideas or abstractions, but which may be measured indirectly by the use of indicator variables. Relationship quality represents the static component, while relationship strength covers the dynamic aspects of a relationship. The former comprises more inter-personal factors, such as trust, commitment or satisfaction with a business partner. The latter considers non-coercive and coercive behavior and past chain experiences. It is indicated by the existence of switching costs, resistance to disruption and a positive collaborative history with a business partner. Relationship quality and strength are interrelated and together form sustainable relationships. Relationship sustainability may also be referred to as 'relationship goodness'. Goodness is the meta-term encompassing both current quality aspects, and past development criteria as an indicator for the relative strength of a relationship.

Following the academic literature review, a pilot study on business relationships in agri-food chains was conducted, utilizing expert interviews. This process involved interviews with key informants who mostly came from large companies and

industry/trade associations and generally held senior management positions. The procedure and outcome of these expert interviews are described in Fischer et al. (2007). Based on the findings of both the literature review and the expert interviews, the following hypotheses were developed with regard to potential determinants of the goodness of business relationships in European agri-food chains.

Chain-internal determinants

H1 Communication positively affects the goodness of business relationships.

H2 The existence of personal bonds positively affects the goodness of business relationships.

H3 The power distribution between a supplier and a buyer affects the goodness of business relationships. The more equally the power is distributed, the better the goodness of a relationship.

Chain-external determinants

H4 The higher the degree of embeddedness in the local economy in which an agri-food business operates, the better the goodness of business relationships.

H5 The higher the degree of competition in the market in which an agribusiness operates, the better the goodness of business relationships.

H6 The higher the traceability requirements are, the better is the goodness of business relationships.

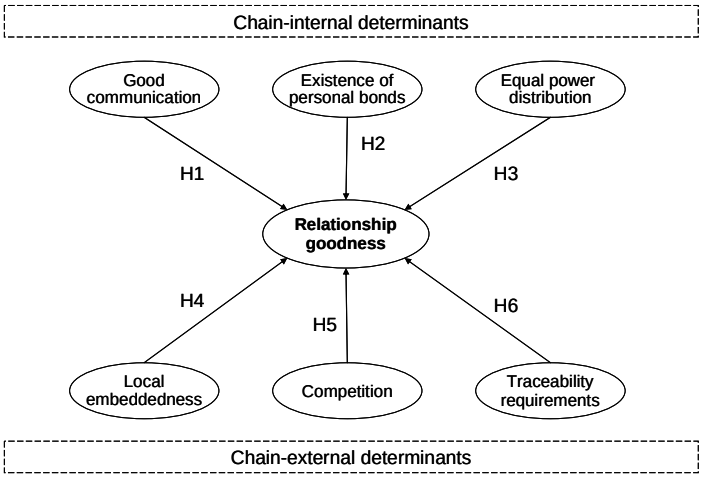

Figure 1. Hypothesized chain-internal and chain-external determinants of relationship goodness

Figure 1 summarizes theses hypotheses in a chart. Following the conventions in the structural equation modeling, we use ovals for depicting constructs. Directly observed (and measured) variables are usually depicted as squares. At this stage, however, for the sake of simplicity, we only use ovals.

Good communication

Communication can be seen as formal and informal sharing of information between chain stakeholders, which facilitates relationships between organizations and which makes beneficial outcomes possible. Communication in supply chains will be influenced by various factors. Most of these can be allocated into three groups: *communication behavior, information quality, and communication tools* (Mohr and Nevin, 1990; Mohr et al., 1996).

Communication behavior characterizes that part of organizational or individual behavior resulting in a communication process. Large (2003) identifies several individual factors influencing communication behavior. *Communication capability* means the capability to transmit information, e.g., the capability to speak and to write (Rubin, 1985). *Communication readiness* describes motivation to communicate and can be analyzed by considering communication attitude. *Communication climate* refers to the total rules of communication and attitudes towards communication in an organization (Large, 2003). *Norms of communication* are created in the organization as a result of mutual observation of organization members' communication behavior. So unwritten communication rules and traditions develop in the organization. Additionally, managers can give norms of communication. Moreover, communication quality and behavior depend on the following technical characteristics: frequency, directionality, formality, and content (Mohr and Nevin, 1990; Mohr et al., 1996).

Farace et al. (1977) define information in terms of the reduction of uncertainty. Information in this sense is a measure of uncertainty, or entropy, in a situation. Low and Mohr (2001) use the indicators of relevance, accuracy, reliability and timeliness to characterize quality of information, drawing on the work of O'Reilly (1982). *Relevance* means that information is useful and significant for the decision process, or for achieving special objectives. *Accuracy* stands for clear and precise formulation and transmission of information. *Reliability* corresponds to the trustworthiness of the information. *Timeliness* characterizes information distribution in time; up-to-date information allows the receiver to react appropriately. The factors of relevance and accuracy do not refer solely to information quality, but also to information quantity. Information should be delivered in appropriate quality and quantity. Previous research shows that managers tend to believe that more information is better (O'Reilly, 1980). Lack of information is connected to poor decisions. On the other hand, the problem of information overload seems to increase in an era of widening communication media and decreasing costs of information transmission. Thus, all information is often transmitted to the partner without processing. Important information can get lost in the midst of non-relevant messages. Dias (2001) concludes: "Due to the technology advances and the wide dissemination of information, many institutions

suffer from information overload and need to apply information management to deal with this information chaos in the digital world."

Personal bonds

The notions of social bonds encapsulate the idea that economic behavior is embedded in, and mediated by, a complex and extensive web of interpersonal relationships (Granovetter, 1985). In the case of agri-food supply chains, both economic (e.g., prices, costs and markets) and social (e.g., personal bonds, trust and friendship) relations are seen as being vital for success (see Hinrichs, 2000; Winter, 2003). While strong personal bonds generally contribute to good business relations, business relationships differ from personal ones because of the former's formality and supposed independence from individuals. Consequently, business relationships can be managed systematically and analyzed formally. Nevertheless, it can be assumed that strong personal bonds generally contribute to good business relations.

Equal power distribution between buyer and supplier

Behavioral economics reveals important deviations between human behavior and neo-classical assumptions. One of these findings concerns non-egoistic behavior, regarding fairness. In decisions about personal gains, people not only consider their own benefits but also those of others. When they perceive that benefits may be distributed unfairly, people will often forgo the opportunity to increase their personal wealth if this prevents an increase of wealth of others (Frank, 2003). This behavior is contrary to self-interest. Equal power distribution among economic partners increases the probability that rewards of the partnership will be distributed fairly among the partners. Thus, equal power distribution might be a precondition for (some) economic agents to get involved in business relationships and an important determinant for evaluating the "goodness" of a business relationship.

Local embeddedness

The notions of social embeddedness and local ties encapsulate the idea that economic behaviour is embedded in, and mediated by, a complex and extensive web of interpersonal relationships and larger social structures (Granovetter, 1985). The concepts of embeddedness and local ties are fruitful theoretical perspectives for describing and explaining network dynamics, as firms are embedded in wider business networks which extend far beyond the boundaries of the individual company (Halinen *et al.,* 1998). Social embeddedness and local ties may have the effect of strengthening food supply activity and assisting its co-ordination and sustainability. This perspective may well provide an important explanatory dimension as to how agri-food supply chains operate and why. As Hinrichs (2000: 510) argues, by applying the concept of embeddedness, economic activity "…holds

more nuance and complexity than when individuals are seen simply as optimising for maximum returns…". Murdoch *et al.* (2000) note that in the food sector embeddedness matters and, given recent and current trends (e.g., rising concerns about food safety and ecological conditions), will probably matter even more in the future.

The operationalisation of the embeddedness concept may be thought of as the extent to which a company is anchored into a local economy. In particular in the still mostly rural agri-food business sector, the amount of social capital a farmer or a rural processing company may accumulate and be able to exploit profitably, may be positively correlated to the extent to which the farmer/company has developed local ties. These local ties may manifest themselves in different ways: the production of local products (e.g., those labeled with geographic indicators), the use of local suppliers, the direct marketing to local customers, or other local ties such as corporate sponsoring of local infrastructure projects (e.g., investments in the creation/development of cheese or wine trails, donations for setting up/maintaining a farmers' market, etc.). Often, these different local ties go hand in hand and are thus positively correlated with each other. For instance, by law, for the production of PDO products, only locally produced ingredients are allowed. Alternatively, companies who mostly sell to local customers may be more likely to also be involved in the production or marketing of locally produced products.

Competition

Globalization-related developments as well as political changes (e.g., stricter environmental and food-safety regulations) have led to an increase in the competitive pressure for businesses in European agri-food chains. While this is true for all actors in the food system, this is particularly relevant for the retail sector (Venturini, 2003). Higher levels of competition may force companies to more collaboration in order to become more competitive as a newly formed chain. In particular, non-arm's-length relationships (e.g., long-term contracts or financial participation arrangement) are capable of generating relational rents for chain partners. This is driven by the achieved larger leverage to secure or gain market share, to improve margins as a result of increased bargaining power and to increase production efficiency by exploiting scale effects. Nevertheless, very high levels of competition may also force companies to behave more self-interested and opportunistically in order to secure survival in a highly demanding market. Thus the effect of competition on relationship-goodness is a priori not clear cut but we rather expect it as being positive.

Traceability requirements

Traceability systems have been made mandatory in many food chains in numerous countries in order to secure minimum levels of food safety and quality (Hobbs,

2004). Yet, besides the impact of these systems on product parameters, the implementation of public or private traceability mechanisms has been shown to have an impact on the choice of relationships between the involved chain partners. Ranyaud *et al.* (2005) review different quality-enforcement measures in various agri-food chains and its influence on the choice of economic relationships. They find that the use of quality labels and the use of enforcements mechanisms such as traceability systems can lead to closer and longer-term relationships between the implementing enterprises. The reason for this may be that the implementation of shared information systems, which allow the tracking and/or tracing of contaminated produce, requires the involved parties to assume responsibility for partners' failure and thus forces stronger collaboration among them in order to avoid the production and distribution of faulty products in the first place. Thus we expect the existence of a chain-wide traceability system to effect relationship goodness positively.

Model specification

Overall, we hypothesize that relationship goodness (RG) is a linear function of at least three chain-internal determinants: good communication (GC), the existence of personal bonds (PB) and equal power distribution (EP). It is also affected by at least three chain-external determinants, embeddedness in the local economy (LE), the degree of competition (CO) and the existence of traceability requirements (TR). The following equation summarizes our assumed, model:

$$\mathrm{RG} = \beta_0 + \beta_1 \times \mathrm{GC} + \beta_2 \times \mathrm{PB} + \beta_3 \times \mathrm{EP} + \beta_4 \times \mathrm{LE} + \beta_5 \times \mathrm{CO} + \beta_6 \times \mathrm{TR} + \varepsilon$$

Empirical procedure

To test our hypotheses, we study the relationship situation in five different EU countries (Germany, UK, Ireland, Finland, and Poland) for two different commodities (meat and cereals) and two different value-chain relationships (upstream: farmers-processors and downstream: processors-retailers).

Questionnaire development and data collection

Based on the pilot study findings (see Fischer et al., 2007), a survey instrument was developed to validate the previous results and, most importantly, to expand the acquired understanding of relationships within EU agri-food chains. While industry experts are a valuable source of information, experts are often obliged to offer 'official' and 'consensus' views. Consequently, a richer picture (in terms of completeness and level of detail) may be obtained by surveying involved businesses directly. The enterprise/company questionnaire developed for the survey needed to be used simultaneously in different countries. Therefore, considerable effort was spent on the wording, the response formats (i.e., measurement scales) and the

clarity of instructions. After translation into the respective languages, the survey instrument was pre-tested separately in the different countries, which resulted in some minor changes to its design.

The method of data collection differed across the collaborating countries. Overall, most of the obtained samples were self-selecting, i.e., neither randomly drawn nor quota-based (the Finnish samples were randomly collected). The main contact method was the use of mailed questionnaires (together with follow-up phone calls or a subsequent mailing to remind participants). In some countries, personal interviews were conducted (mostly with farmers) or respondents were interviewed by telephone. In parallel, a survey website was established (which also offered a relationship and communication benchmarking facility for participants as an incentive and immediate feedback mechanism), which was promoted using a wide range of public relation and marketing measures aimed at maximizing the chances that relevant businesses would become aware of the survey and thus have the opportunity to take part. In addition, active collaboration with sector organizations and trade/industry associations was sought, which informed relevant farmers and companies using (i) newsletters, (ii) press releases, (iii) animated website banners, (iv) telephone calls, (v) emails, (vi) SMS and/or (vii) research-project flyers. The subsequent analysis of the data obtained from the cross-country, multi-commodity survey of farmers, food processors and retailers is based on 1,026 usable responses.

Sample representativeness, key informant quality, non-response bias and measurement validation

The representativeness of the obtained sample was assessed using two criteria for which complete target population information is available across the different countries: regional distribution of company location and farm/company size (as measured in terms of arable land size, number of livestock, number of employees and annual turnover). While the representativeness of the collected data differs across the collaborating countries, in general the obtained responses reflect the most important location- and business size-related disparities.

Overall, 89% of survey respondents claimed to be in upper management positions or (part-) owners of the surveyed businesses, thus giving confidence in the quality of the answers obtained. Non-response bias was assessed by comparing early survey responses with later ones, using multivariate analysis of variance on key demographic characteristics (Armstrong and Overton, 1977). However, no significant differences were found.

In the following analysis, several constructs (e.g., good communication, local embeddedness) are used. In addition, two variables (existence of personal bonds and equal power distribution) are not specified as constructs but are measured as single, directly observed items (see Appendix A and B for a full description of all

employed items). The 'relationship goodness' construct is reported in the results section as a one-level, four-item latent factor. It is the one with the highest construct reliability (Anderson and Gerbing, 1988) as assessed by Cronbach's Alpha (.890), which is formally regarded as highly satisfactory.[2] The factor loadings and significant levels for these items are reported in the following results section. For the 'good communication' construct, two items are used. Cronbach's Alpha for this construct is .852. The 'local embeddedness' construct was specified using reflective indicators, in which case the usual reliability and validity measures do not hold. In addition, all four items in this construct were measured as dummy variables, which may have an impact on the construct's statistical performance.

Model estimation

Structural equation modeling (SEM; also called covariance structure analysis) was used to empirically test our research hypotheses.[3] In its most general form, SEM consists of a set of linear equations that simultaneously test two or more relationships among directly observable and/or unmeasured latent variables. While SEM serves purposes similar to multiple regression, differences exist between these techniques. As an extension of the general linear model, SEM is built on more flexible, and thus more realistic, assumptions about the data to be used. In particular (see Bollen, 1989), SEM allows (i) the interpretation of estimation results even in the face of multicollinearity between regressors, (ii) the use of confirmatory factor analysis to reduce measurement error by having multiple indicators per latent variable (i.e., testing constructs), (iii) testing of models overall rather than coefficients individually, (iv) testing of models with multiple dependents, (v) modeling of mediating variables, (vi) modeling of error terms, (vii) testing coefficients across multiple between-subjects groups, and (viii) handling difficult data (in particular non-normal or incomplete data).

For an assessment of how well the specified SEM fits the analyzed data, the following criteria are commonly used (Shook *et al.*, 2004): (i) the Chi-square Test, (ii) the Normed Fit Index (NFI) and (iii) the Root Mean Square Error of Approximation (RMSEA). The chi-square fit index tests the hypothesis that an unconstrained model fits the covariance/correlation matrix as well as the given model. The chi-square value should not be significant if there is a good model fit. If it is significant, the model is rejected as not being a good fit to the data (there is a significant deviation of the model from the data). A problem with this test is that

[2] We also tested a two-level, six-item 'relationship goodness' construct, made up from two latent factors (relationship quality and relationship strength, both measured by three different items). However, the final overall model fit was less satisfactory, thus we decided to report only the results for the structural equation model based on the one-level, four-item 'relationship goodness' construct.

[3] We used the AMOS software package (version 6.0), with unbiased covariances as the input matrix. Missing values are present in our dataset and consequently maximum likelihood estimation was the preferred estimation method. We tested for univariate and multivariate normality of the key variables using standard routines; however, we did not find worrying deviations from these distributions.

the larger the sample size, the more likely becomes the rejection of the model. The chi-square fit index is also sensitive to violations of the assumption of multivariate normality. More commonly used is the minimum sample discrepancy divided by degrees of freedom (CMIN/DF). Values as large as 5 are accepted as adequate fit, but more conservative thresholds are 2 or 3. The NFI varies from 0 to 1, with 1 representing the perfect fit. By convention, NFI values below .90 indicate a need to re-specify the model. The RMSEA incorporates a discrepancy function criterion (comparing observed and predicted covariance matrices) and a parsimony criterion. Most sources recommend that there is good (adequate) model fit if the RMSEA is less than or equal to .05 (.08).

Estimation results

In this section, we first report the results across the analyzed agri-food chains, countries, value chain stages and relationship types with respect to the perceived goodness of the 'most important' B2B relationships experienced by those enterprises taking part in the survey. Second, the main determinants of the goodness of these relationships, derived from the SEM estimations, will be presented.

Goodness-of-relationship scores

Tables 1 and 2 report the obtained goodness-of-relationship scores[4] for the two different commodities/products (meat and cereals) and separately for the two value-chain relationships (i.e., the farmer-processor and processor-retailer one).[5] The perceived average scores are reported separately for the different assessed EU countries. Also, the scores are given for different relationship types on which the relationship with the most important buyer/supplier are based.

[4] The scores were calculated as an unweighted average involving the six individual components (items): trust in, commitment towards, satisfaction with, positive collaboration history with, resistance versus disruption and dependence on the buyer/supplier in the most important business relationship of the surveyed farmer/company. Index scores were only calculated where valid data on each individual item were available.

[5] The given scores are averaged across farmers and processors in the 'farmer-processor' relationship and across processors and retailers in the 'processor-retailer' relationship. While it is likely (and indeed the case) that upstream and downstream stakeholders rate the respective relationships differently, in this paper we are interested in comparing the two chain-level relationships rather than the different stakeholders.

Table 1. Goodness* of B2B relationships in EU meat (beef, pig) agri-food chains

		Farmer-processor	*Processor-retailer*
Country	Germany	5.0 (23)	5.2 (11)
	UK	5.5 (142)	5.9 (4)
	Ireland	5.2 (83)	5.8 (20)
	Finland	4.9 (81)	5.5 (17)
	Poland	5.0 (223)	5.7 (105)
	Total	**5.1 (552)**	**5.7 (157)**
Relationship type	Repeated market transactions with same supplier/buyer	5.1 (342)	5.7 (111)
	Contracts	5.1 (105)	5.5 (27)
	Financial participation	5.1 (10)	5.9 (3)
	Other	5.1 (74)	5.7 (9)
	Total	**5.1 (531)**	**5.7 (150)**

Note: * Index score calculated on the basis of six individual components, each one measured on a rating scale (1 = very poor; 7 = very good). In parentheses, number of observations.

In the meat chain (Table 1), goodness-of-relationship scores are by and large high though they are generally larger in the downstream relationship. The differences between downstream and upstream relationships over all countries are statistically significant at the 99% confidence level (using univariate ANOVA testing). Differences also exist in the individual relationships between the countries. In the upstream relationship, Finland seems to have the lowest relationship score while the UK has the highest. In the downstream relationship, the UK scores highest again, whilst Germany reveals the lowest scores, but in both countries the sample is small. However, the differences are only statistically significant at the 99% confidence level in the farmer-processor case. In practical terms, the observed differences seem to be too small to carry important implications. Comparing the goodness-of-relationship scores across different relationship types, no major differences exist, neither in the upstream nor in the downstream relationship. In fact, the reported scores are not statistically significantly different at the 95% confidence level in either of them.

In the cereal chain (Table 2), goodness-of-relationship scores are similarly relatively high, and on average across all countries are higher in the downstream relationship. [6] However, in this case, these differences are overall not statistically significant at the 95% confidence level. Also, similar to the meat chain, the highest (lowest) goodness-of-relationship scores in the upstream relationship seem to

[6] This does not hold for Germany and the UK. The goodness-of-relationship scores are higher in the upstream sector.

Table 2. Goodness* of B2B relationships in EU cereals (wheat, barley, rye) agri-food chains

		Farmer-processor	*Processor-retailer*
Country	Germany	5.3 (55)	5.2 (25)
	UK	5.8 (59)	5.3 (2)
	Ireland	–	–
	Finland	4.8 (87)	5.5 (34)
	Poland	–	–
	Total	**5.2 (201)**	**5.4 (61)**
Relationship type	Repeated market transactions with same supplier/buyer	5.3 (106)	5.2 (25)
	Contracts	5.1 (76)	5.5 (29)
	Financial participation	5.8 (3)	–
	Other	4.9 (12)	5.8 (4)
	Total	**5.2 (197)**	**5.4 (58)**

Note: * Index score calculated on the basis of six individual components, each one measured on a rating scale (1 = very poor; 7 = very good). In parentheses, number of observations.

prevail in the UK (Finland), while in the downstream case, relationships seem best in Finland and worst in Germany. Regarding the farmer-processor case, the differences are statistically significant at the 95% confidence level between the individual countries, while they are not significant in the processor-retailer relationship. However, as in the meat chain, the differences are too small to have any real practical implications. Across the different relationship types, the highest (lowest) scores are observed in the 'financial participation' ('other') category in the upstream case. Nonetheless, it should be noted that financial participation, with only three observations, has hardly any relevance in the sample. The second highest score is reached by the relationship type 'repeated market transaction'. In the downstream case, this relationship type reaches the lowest scores, while 'other' ranks highest. However, here also it has to be noted that only four observation fall into this latter category. The differences discussed are not significant but fall into the sampling error range.

Overall, the results indicate that respondents evaluate their 'most important' business relationship as comparatively good. This holds for all investigated EU countries, analyzed commodities/products, value-chain stages and relationship types. Divergences in the achieved scores between countries, chain stages and relationship types are in general small. Only in the meat chain can larger differences in the scores be observed between the downstream and upstream relationships at the aggregate level.

Determinants of relationship goodness – SEM estimation results

Following the theoretical discussion above, we now proceed to test the different hypothesized goodness-of-relationship determinants (see above). First, we present a general (i.e., non-group-specific) structural equation model. We report only the results for the best performing model which emerged from many tested alternative specifications. [7] In particular, the estimated structural coefficients for our two variables related to hypotheses 5 and 6 (competition and traceability requirements) were consistently found to be statistically insignificant and were thus dropped from the final model. Second, for this "best" model, separate results for the farmer-processor and processor-retailer relationship (across all countries) and for each country (with the exception of Poland for which data on key variables were missing) are presented.[8]

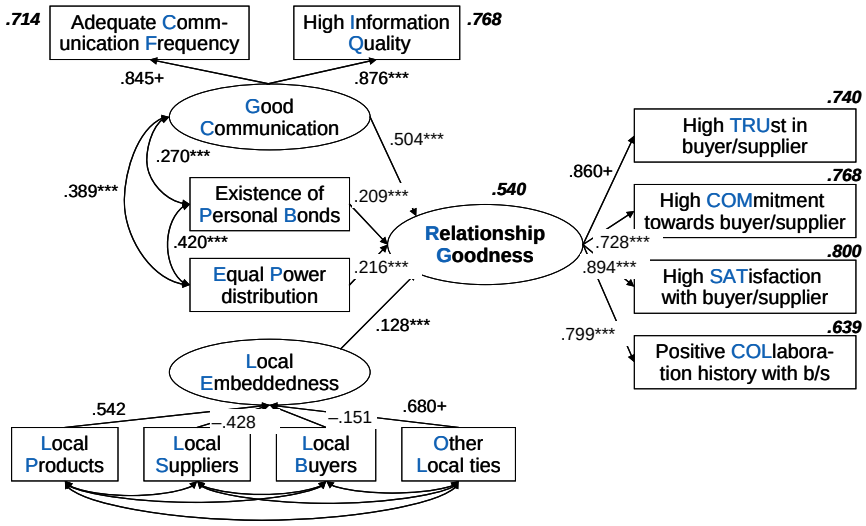

Figure 2. Determinants of relationship goodness – general (i.e., non-group-specific) SEM estimation results

Notes: .000 = standardized estimated parameters;
*** (**, *) statistically significant at least at the 99% (95%, 90%) confidence level;
+ constrained parameter, no significance level available;
. 000 = squared multiple correlations (R^2);
Model fit measures: CMIN/DF = 2.463 (p = .000); NFI = .973; RMSEA = .038;
Sample size: 1,026 observations.
Local embeddedness indicator correlations: LP <–> LS: .190***; LS <–> LB: .383***; LB <–>OL: .099***; LP <–> LB: .114***; LS <–> OL: .083*; LP <–> OL: .221***.

[7] Thus, we do not claim that our model is the only one which fits the data. Nor do we claim that it is a complete description of the phenomenon under investigation. The analysis was conducted on the basis of cross-section data and some of the hypothesis-test results may be different in the case of longitudinal data. Furthermore, given the cross-sectional design, causality cannot be fully established. All that can be said for sure is that our data are not inconsistent with the causal relationships hypothesized and depicted. However, we do claim that the presented model is the one which fits best our data, among the many alternative specifications which are theoretically permissible and which have been tested.

[8] The group-specific estimations were technically implemented as multi-group analysis.

Figure 2 displays the non-group-specific estimation results. Overall, the model fits the collected data quite well, with all goodness-of-fit measures above (below) the recommended acceptance levels (CMIN/DF = 2.463; NFI = .973; RMSEA = .038).

In the structural model, four variables have a positive and statistically highly significant impact on the goodness-of-relationship construct: good communication; the existence of personal bonds; equal power distribution between buyer and supplier; and embeddedness in the local economy of a farmer/company. This confirms our hypotheses on chain-internal-determinants (see section 2.2) and one of the hypotheses related to chain-external-determinants. As for the other chain-external hypothesized determinants, none of corresponding variables had a statistically significant impact on relationship goodness. The most important general contributor to the goodness of a business relationship is good communication (with a standardized regression weight of .50), followed by an equal power distribution between business partners (.22), the existence of personal bonds (.21) and the local embeddedness of a farmer/company (.13). The former three determinants are positively and statistically significantly correlated with each other, suggesting that the existence of personal bonds contributes to good communication, that equal power distribution contributes to the development of personal bonds and to good communication, and vice versa. Overall, 54% of the variance in the observed goodness-of-relationship construct can be explained by the four identified determinants.

In the measurement models, the reflectively specified constructs 'relationship goodness' and 'good communication' perform very well, with all factor loadings being above the recommended levels of .60 and all communalities also being larger than .60 (except for the commitment item, which is .53). The formatively specified construct 'local embeddedness' displays some comparatively low and negative regression weights. This indicates that this construct's validity and reliability may be limited. As all the indicators used for this construct were measured as dummy variables, this may be a key reason for its lower measurement performance.

Disaggregated (i.e., group-specific) SEMs have also been estimated. The first model accounts for the differences between the two value-chain relationships (estimated across all countries). Model 2 shows the individual estimates for each country (combined for both relationships). The detailed estimation results are reported in Appendix Table C. In the following we discuss the most important findings from these estimations in turn.

The relationship-specific estimates show that the identified relationship-goodness determinants have different impacts, depending on the chain-stage level.

- In the farmer-processor relationship, good communication (standardized regression weight of .487) is the most important relationship-goodness determinant, followed by equal power distribution (.223) and the existence of

personal bonds (.213). Local embeddedness does not play a significant role.[9] Taken together, these three determinants explain 52.5% of the variance in the goodness-of-relationship score. These determinants are also positively and significantly correlated with each other. The measurement models, with the exception of the 'local embeddedness' construct, all perform well, similar to the situation in the general (non-group-specific) model.

- In the processor-retailer case, good communication is even more important (.571), followed by equal power distribution (.239), local embeddedness (.232) and the existence of personal bonds (.170). All four determinants taken together explain 63.1% of the variance in the goodness-of-relationship score. As for the correlation between the determinants, no significant association exists between personal bonds and equal power distribution, underlining the fact that the existence of personal bonds not only is less important in the processor-retailer case, but that the development of these bonds is also independent of the power-distribution situation. As before, the involved measurement models, with the exception of the 'local embeddedness' construct, perform equally well.

The country-specific results reveal some important differences between the analyzed countries which may reflect differences in national and/or business culture.

- In Germany, the most important relationship-goodness determinant is equal power distribution between supplier and buyer (.408), followed by existence of personal bonds (.362) and good communication (.277). Local embeddedness does not play a role. Taken together, the three determinants explain about 61.3% of the variance of the goodness-of-relationship score. All three determinants are positively and highly significantly correlated with each other. The measurement models perform relatively well, although there are two estimates which are not permissible (i.e., larger than 1), due to the relative small sample size.
- In the UK, good communication is the most important determinant (.423) for a good business relationship, followed by equal power distribution (.324) and the existence of personal bonds (.178). Local embeddedness does not play a significant role. All three determinants are positively and highly significantly correlated to each other and together explain 62.3% of the variance of the goodness-of-relationship score. The measurement models perform comparatively well.
- In Ireland, the goodness of relationship is determined only by the existence of personal bonds (.290) and good communication (.197). Neither equal power

[9] It should be noted that respondents were allowed to interpret the meaning of concepts such as 'local' and 'regional' themselves in some countries. This was the case in Finland and Ireland, whilst in other countries 'local' was defined according to administrative units of varying sizes. Thus it may be that 'local' is interpreted on a smaller scale for farmer-processor relationships than for processor-retailer relationships, given the relative scale of operation of the various supply chain participants.

distribution nor local embeddedness play a significant role. However, some other factors must be important because the two identified determinants, taken together, only explain 31.7% of the variance of the goodness-of-relationship score. Similar to Germany, the measurement models perform generally well, although there are also two estimates which are not permissible (again the relatively small sample size is probably the reason).

- In Finland, finally, our estimations show that local embeddedness seems to be the only significant determinant (among the ones investigated) for the goodness of business relationship, in itself explaining 61.9% of the variance of the measured score. Nevertheless, the three other determinants are all positively and significantly correlated with each other. In the measurement models, it appears that local suppliers do not seem to be important in the Finnish context, since the variable has a negative impact on the 'local embeddedness' construct and is also negatively correlated with the 'local product' variable. In addition, the 'local buyer' variable is significantly correlated to the 'local other ties' variable only in the case of Finland.

Discussion and conclusions

This paper has endeavoured to provide an initial assessment of the determinants of business relationships within agri-food supply chains. Drawing on over 1,000 survey responses from the meat and cereal sectors in five EU countries, it presents a number of important findings.

First, for the sectors studied, the 'most important' relationships experienced by supply chain participants in both the meat and cereal chains are perceived as relatively good (i.e., lying between the 'somewhat good' and 'good' categories used in the survey). This result applies across all the countries considered, as well as at the different stages of the chain and for the various relationship types. The one area of significant difference is that relationships are generally perceived as being better at the processor-retailer level than at the farmer-processor level, although there are some slight exceptions to this pattern in the cereal chain. It may be that the small scale of many farmers' businesses leads them to perceive themselves as being in a weak bargaining position and vulnerable within relationships with larger scale processors. Alternatively, their small scale may inhibit their ability to engage in, or draw benefit from, supply chain communications which have been shown to be important to good relationship development. Comparing the goodness of relationships across the different relationship types, no significant differences are apparent.

Second, a structural equation model of the determinants of relationship goodness was developed which fits the collected data well. It encompasses four variables which appear statistically significant in determining relationship goodness, namely: good communication; the existence of personal bonds between chain participants;

equality of power distribution between the transacting parties; and the extent to which participants are embedded in the local economy through the local nature of their product, their trading or other local activities. However, the effect of the latter, the only confirmed chain-external determinant, is only weak. Also, we were not able to find support for the other two chain-external factors, market competition and traceability requirements. Consequently, it seems that relationship goodness is only (or mostly) determined by idiosyncratic dyadic (i.e., relationship-specific) factors. While this finding comes as a surprise, it may not be unreasonable since many companies experience similar external conditions and yet one can observe an entire spectrum from very bad to very good inter-enterprise relationships among these businesses. We also find that the all chain-internal determinants are positively and statistically significantly correlated with each other, suggesting that the existence of personal bonds contributes to good communication, that equal power distribution contributes to the development of personal bonds and to good communication, and vice versa. Overall, these four identified determinants explain more than half of the variance in the observed goodness-of-relationship construct. The following Figure 3 summarizes the findings, where the importance of the individual determinants is reflected by the size of the corresponding arrow.

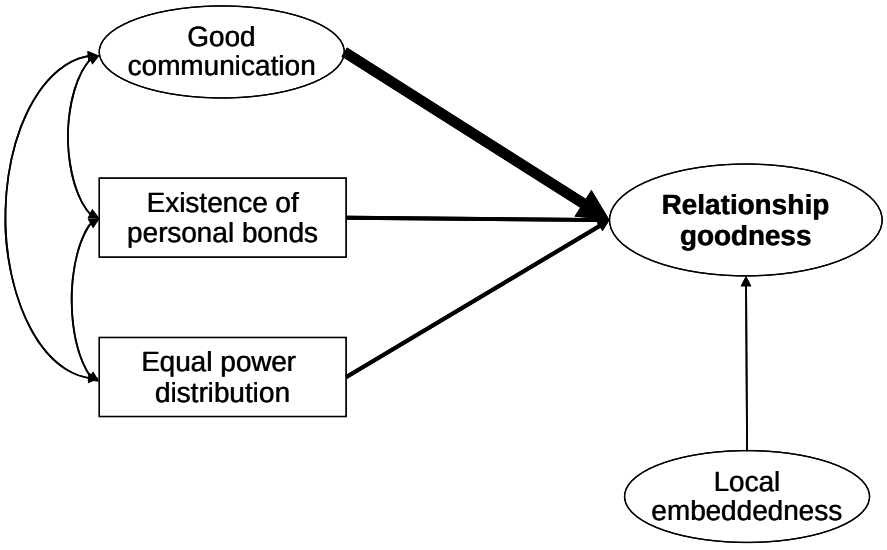

Figure 3. Main determinants of relationship goodness in EU agro-food chains

However, it is important to note that when the structural equation models are disaggregated into upstream and downstream segments of the supply chain, or by country, not all those hypotheses could be confirmed as not all associated variables appear significant. Regarding the value-chain stage, equal power distribution seems to be important only in the relationship between farmers and processors while local embeddedness is only of relevance for the quality of the interaction between processors and retailers. Similarly, at a country level, good communication, the existence of personal bonds, and equality of power distribution

between the transacting parties are important variables explaining relationship goodness in Germany and the UK. In the case of Ireland only the first two variables seem of relevance but their association with relationship goodness is less significant. Finally, in the case of Finland, from the four variables, local embeddedness is the only one that explains relationship goodness. However, it should be noted that a potential problem with the variable local embeddedness is the fact, that 'local' does not mean the same in every country. For example, in the case of the UK, the concept was based on regional location, whereas in Germany the interpretation of 'local' was determined by the respondent.

Regarding the contribution of trust, commitment, satisfaction and collaboration in the definitions of the relationship-goodness construct, the aggregate-level results revealed that all these variables were approximately equally important. [10] However, differences appeared when the analysis was performed by value-chain stage and by country. For instance, in the processor-retailer relationship, commitment seemed to be the least important feature. A similar result was found as regards collaboration in the case of Finland, where, in comparison with other countries, it was found to be the least important component of relationship goodness.

The results indicate that the most important contributor to good supply chain relationships is an adequate frequency and high quality of communication. This outcome confirms the results of other researchers who also see communication as the most important factor in achieving successful inter-firm cooperation (Bleeke and Ernst, 1993; Mohr et al., 1996). Communication can foster the creation of sustainable business relationships and contribute to their stability and evolution. Beyond the exchange of information, communication can contribute to chain performance and the satisfaction of stakeholders, as well as the quality of the relationship in terms of mutual trust and commitment. Thus, communication is regarded as the glue that holds relationships together. One implication of this finding is that stakeholders need to secure the technical and personal preconditions to send out, receive, utilize and respond to information and requests, thus being able to derive the potential benefits linked to good communication and improve their supply-chain relationships. Consequently, for instance, farmers' adoption of IT communication systems, which enable rapid communication of timely, useful information, may be regarded as part of the relationship building process. A further implication of the finding may be that those within the chain who are in a position to communicate information of market or production value (e.g., processors or retailers) may enjoy improved relationships from such communications. In particular for large scale businesses dealing with smaller partners, good communication may be crucial since this may be able to offset the negative impact

[10] That is, the estimated factor loadings for these indicator variables are about the same. For a related and more detailed analysis of the role of trust, using a similar dataset and methodology, see Fritz and Fischer (2007).

which unequal power distribution often exhibits on relationships. Moreover, where farmers can organise themselves, or where they can be organized, into groupings (such as co-operatives, producer groups or clubs) that provide a feeling of enhanced market influence, improved relationships may result. This may be a particularly promising option for the German agri-food sector where equal power distribution has emerged from our estimations as being the relatively most important lever for enhancing B2B relationships.

The importance of personal bonds to relationship goodness, especially at the farmer-processor level, suggests that the retention of key staff in trading positions is of importance to chain relationships, or that the employment of supply chain staff who fit culturally and/or socially with those they transact with may facilitate relationships. Finally, the fact that a high level of correlation exists between good communication, equal power distribution between participants, and the development of personal bonds, indicates that they can be collectively regarded as part of the relationship building process, and that as such they should be developed together in major efforts to build relationships.

References

Anderson, H. and Gerbing, D. (1988): Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach. *Psychological Bulletin*, 103 (3), 411-23.

Armstrong, J. and Overton T. (1977): Estimating Nonresponse Bias in Mail Surveys. *Journal of Marketing Research*, 14 (Aug), 396-402.

Bleeke, J. and Ernst, D. (1993): *Collaborating to Compete*. New York: John Wiley & Sons.

Bollen, K. (1989): *Structural Equations with Latent Variables*. New York: Wiley.

Bruhn, C. M. (1999): Public Communication on the Food Chain, the Foundation of Global Progress. Proceedings of the 1999 Brighton Crop Protection Conference. Brighton: British Crop Protection Council Publications.

Bruhn, M. (2002): *Relationship Marketing: Management of Customer Relationships*. London: Prentice Hall.

Chartier, J. and Gabler, S. (2001): Risk Communication and Government. Canadian Food Inspection Agency, Public and Regulatory Branch.

Christopher, M., Payne, A. and Ballantyne, D. (2002): *Relationship Marketing – Creating Stakeholder Value*. Oxford: Butterworth-Heinemann.

Cox, A. (2004): The Art of the Possible: Relationship Management in Power Regimes and Supply Chain. *Supply Chain Management – An International Journal*, 9 (5), 346-356.

Cox, A., Ireland, P., Lonsdale, C. and Sanderson, J. (2003): *Supply chain management: a guide to best practice*. London: Prentice-Hall.

Crosby, L. and Johnson. S. (2002): CRM and Management. *Marketing Management*, 11 (1), 10-11.

Cuthbertson, R. and Laine, A. (2004): The Role of CRM within Retail Loyalty Marketing. *Journal of Targeting, Measurement and Analysis for Marketing*, 12 (3), 290-304.

Dias, C. (2001): Corporate portals: a literature review of a new concept in Information Management. *International Journal of Information Management*, 21, 269-287.

Dyer, J. and Singh, H. (1998): The Relational View: Cooperative Strategy and Sources of Interorganisational Competitive Advantage. *Academy of Management Review* 23 (4), 660-679

Ellis, P., Pecotich, A. (2001): Social factors influencing export initiation in small and medium-sized enterprises. *Journal of Marketing Research*, 38 (Feb), 119-30.

Farace, R., Monge, P. , Russel, H. (1977): *Communicating and Organizing*. Reading, MA: Addison-Wesley.

Fearne, A., Hughes, D. and Duffy, R. (2001): Concepts of Collaboration: Supply Chain Management in a Global Food Industry. In: Eastham, J. F., Sharples, L. and Ball, S. D. (ed.): *Food Supply Chain Management: Issues for the Hospitality and Retail Sectors*, pp. 55-89. Oxford: Butterworth-Heinemann.

Fischer, C., Gonzalez, M., Henchion, M. and Leat, P. (2007): Trust and economic relationships in selected European agri-food chains. *Food Economics*, 4 (1), 40-49.

Fritz, M. and Fischer, C. (2007): The Role of Trust in European Food Chains: Theory and Empirical Findings. *International Food and Management Review*, 10 (2), 141-163.

FOODCOMM (2006): Theoretical Framework. Report No 1. Key Factors Influencing Economic Relationships and Communication in European Food Chains (FOODCOMM). European Commission: The Sixth Framework Programme, 2002-2006. www.foodcomm.eu

Ford, D., Gadde, L., Hakansson, H. and Snehota, I. (2003): *Managing Business Relationships*, 2nd edition. West Sussex: John Wiley & Sons.

Frank, R. H. (2003): *Microeconomics and Behavior*. New York: McGraw-Hill.

Granovetter, M. (1985): Economic Action and Social Structure: The Problem of Embeddedness. *American Journal of Sociology*, 91(3), 481-510.

Greenberg, D. and Graham, M. (2000): Improving Communication about New Food Technologies. *Issues in Science and Technology*. University of Texas at Dallas, 42-48. www.aaas.org/spp/rd/ch17.pdf

Halinen, A. and Törnroos, J. (1998): The Role of Embeddedness in the Evolution of Business Networks. *Scandinavian Journal of Management*, 14 (3), 187-205.

Hinrichs, C. (2000): Embeddedness and Local Food Systems: Notes on Two Types of Direct Agricultural Market. *Journal of Rural Studies,* 16 (3), 295-303.

Hobbs, J. (2004): Information Asymmetry and the Role of Traceability Systems. *Agribusiness*, 20 (4), 397-415.

Hughes, A. (1996): Forging New Cultures of Food Retailer-Manufacturer Relations? In: Wrigley, N. and Lowe, M. (ed.): *Retailing, Consumption and Capital: Towards the New Retail Geography*. London: Addison Wesley Publishing.

Kumar, K. (2001): Technology to supporting supply chain management: Introduction. *Communications of the ACM*, 44 (6), 58-66.

Large, R. (2003): Interpersonelle Kommunikation und erfolgreiches Lieferanten-management. Eine Kausalanalyse des externen Kommunikationsverhaltens von Beschaffungsmanagern. Wiesbaden: Disseration. www.htw-saarland.de/fut/fue-berichte/inkoli_large_2003.pdf

Lee, H. (2004): The Tripple-A Supply Chain. *Harvard Business Review*, 82 (10), 102-112.

Lindgreen, A., Palmer, R. and Vanhamme, J. (2004): Contemporary Marketing Practice: Theoretical Propositions and Practical Implications. *Marketing Intelligence & Planning*, 22(6/7), 673-692.

Low, G., Mohr, J. (2001): Factors Affecting the Use of Information in the Evaluation of Marketing Communications Productivity. *Journal of the Academy of Marketing Science*, 29 (1), 70-88.

Min, H., and Zhou, G. (2002): Supply chain modelling: past, present and future. *Computers & Industrial Engineering*, 43, 231-249.

Mitra, J. (2000): Making Connections: Innovation and Collective Learning in Small Businesses. *Education + Training,* 42, 228-237.

Mohr, J., and Nevin, J. (1990): Communication Strategies in Marketing Channels: A Theoretical Perspective. *Journal of Marketing*, 54 (4), 36-51.

Mohr, J., Fisher, R., Nevin, J. (1996): Collaborative Communication in Interfirm Relationships: Moderating Effects of Integration and Control. *Journal of Marketing,* 60 (3), 103-115.

Murdoch, J., Marsden, T. and Banks, J. (2000): Quality, Nature and Embeddedness: Some Theoretical Considerations in the Context of the Food Sector. *Economic Geography*, 76 (2), 107-25.

O'Reilly, C. (1980): Individuals and Information Overload in Organizations: Is More Necessarily Better? *Academy of Management Journal*, 23 (4), 684-696.

O'Reilly, C. (1982): Variations in Decision Makers' Use of Information Sources: The Impact of Quality and Accessibility of Information. *Academy of Management Journal*, 25 (4), 756-771.

Prahalad, C. and Ramaswamy, V. (2004): Co-creating Unique Value with Customers. *Strategy & Leadership*, 32 (3), 4-9.

Raynaud, E., Sauvee, L. and Valceschini, E. (2005): Alignment between Quality Enforcement Devices and Governance Structures in the Agro-food Vertical Chains. *Journal of Management and Governance*, 9, 47-77.

Rubin, R. (1985): The Validity of the Communication Competency Assessment Instrument. *Communication Monographs,* 52, 173-185.

Sage, C. (2003): Social Embeddedness and Relations of Regard: Alternative 'Good Food' Networks in South-West Ireland. *Journal of Rural Studies*, 19 (1), 47-60.

Schulze, B., Spiller, A. and Wocken, C. (2006): Supplier Relationship Quality in the German Pork and Dairy Sector: Theoretical Considerations and Empirical Evidence. Contributed paper, 16th IAMA Conference, June 10-13, Buenos Aires, Argentina. www.ifama.org/conferences/2006Conference/SymposiumFinal/1021_Paper.pdf

Shook, C., Ketchen, D., Hult, G. and Kacmar, K. (2004): An Assessment of the Use of Structural Equation Modeling in Strategic Management Research. *Strategic Management Journal*, 25, 397-404.

Venturini, L. (2003): The Food System in Transition: an EU Perspective. Working Paper 03-1, presented at the 8th Joint Conference on Food, Agriculture and the

Environment, August 25-28, 2002, Red Cedar Lake, Wisconsin. http://ageconsearch.umn.edu/handle/123456789/21812

Winter, M. (2003): Embeddedness, the New Food Economy and Defensive Localism. Journal of Rural Studies, 19 (1), 23-32.

Appendix A. Item information

Short denomination	*Full description, measurement scale and descriptive statistics*
Adequate communication frequency (CF)	Satisfaction with the communication frequency of our supplier/buyer in the most important business relationship *Seven-point rating scale (1 = completely dissatisfied, …, 7 = completely satisfied)* *N* = 980, Mean = 5.53, Std dev = 1.15
High information quality (IQ)	Quality of received information from our supplier/buyer in the most important business relationship *Seven-point rating scale (1 = completely dissatisfied, …, 7 = completely satisfied)* *N* = 962, Mean = 5.51, Std dev = 1.14
Existence of personal bonds (PB)	This relationship is characterised by strong personal bonds *Seven-point Likert scale (1 = fully disagree, …, 7 = fully agree)* *N* = 917, Mean = 4.26, Std dev = 1.77
Equal power distribution (EP)	We are equal partners in this relationship *Seven-point Likert scale (1 = fully disagree, …, 7 = fully agree)* *N* = 228, Mean = 4.14, Std dev = 1.79
High trust in buyer/supplier (TRU)	Our trust in our supplier/buyer in our most important business relationship *Seven-point rating scale (1 = very poor, …, 7 = very good)* *N* = 982, Mean = 5.69, Std dev = 1.07
High commitment towards buyer/supplier (COM)	Our commitment towards this buyer/supplier *Seven-point rating scale (1 = very poor, …, 7 = very good)* *N* = 972, Mean = 5.61, Std dev = 1.10
High satisfaction with buyer/supplier (SAT)	Our satisfaction with this buyer/supplier *Seven-point rating scale (1 = very poor, …, 7 = very good)* *N* = 983, Mean = 5.60, Std dev = 1.11
Positive collaboration history with buyer/seller (COL)	Our collaboration with this buyer/supplier in the past *Seven-point rating scale (1 = very poor, …, 7 = very good)* *N* = 944, Mean = 5.61, Std dev = 1.10

Local products (LP)	The products that our company produces/distributes have a strong local or regional identity *N*= 718, Distribution = 42.9% (Yes); 57.1% (No)
Local suppliers (LS)	The majority (>50%) of our suppliers are located in the region in which our company is located *N*= 596, Distribution = 64.6% (Yes); 35.4% (No)

Appendix A. continued

Local buyers (LB)	The majority (>50%) of our buyers are located in the region in which our company is located *N*= 809, Distribution = 68.7% (Yes); 31.3% (No)
Other local ties (OL)	Our company participates in local events or donates money to the local community *N*= 753, Distribution = 48.5% (Yes); 51.5% (No)

Appendix B. Item matrix (histograms & bivariate correlations) †

	CF	IQ	PB	EP	TRU	COM	SAT	COL
CF		–	–	–	–	–	–	–
IQ	.742		–	–	–	–	–	–
PB	.220	.256		–	–	–	–	–
EP	.304	.371	.456		–	–	–	–
TRU	.481	.499	.406	.485		–	–	–
COM	.375	.404	.315	.348	.625		–	–
SAT	.478	.506	.405	.488	.770	.642		–
COL	.449	.450	.335	.517	.688	.579	.725	

Notes: †non-dummy items only.
All given correlation coefficients are statistically significantly different from zero at the 99% confidence level.

Appendix C. Detailed group-specific SEM estimation results – standardized parameters† and significance levels

		Model 1		*Model 2*			
	Path‡	Farmer-processor (n = 791)	Processor-retailer (n = 229)	Germany (n = 129)	UK (n = 233)	Ireland (n = 105)	Finland (n = 224)
Structural model	GC –> RG	.487***	.571***	.277***	.423***	.197**	
	PB –> RG	.213***	.170***	.362***	.178***	.290**	
	EP –> RG	.223***	.239*	.408***	.324***		
	LE –> RG	.140*	.232***				.249***
	GC <–> PB	.262***	.195**	.332***	.529***	.372**	.285***
	GC <–> EP	.346***	.469***	.293***	.576***	.403**	.829***
	PB <–> EP	.462***		.327***	.487***	.591***	.632***
	R^2 RG	.525	.631	.613	.623	.317	.619
Measurement models	CF <– GC	.838+	.852+	1.03+	.854+	.641+	.849+
	IQ <– GC	.865***	.908***	.831***	.865***	1.07***	.864***
	TRU <– RG	.865+	.828+	.870+	.896+	.819+	.877+
	COM <– RG	.722***	.694***	.780***	.807***	.760***	.655***
	SAT <– RG	.886***	.922***	.928***	.928***	.886***	.903***
	COL <– RG	.784***	.818***	.912***	.840***	.880***	.676***
	LP –> LE						
	LS –> LE						–.552*
	LB –> LE						
	OL –> LE	.462+	.896+	.495+	.307+	.245+	.694+
	LP <–> LS	.203***	.231*	.307***		.247**	–.153**
	LS <–> LB	.395***	.371***	.248**	.366***	.370***	.438***
	LB <–> OL	.101**					.231***
	LP <–> LB	.144***		.174*	.300***		
	LS <–> OL	.132***					
	LP <–> OL	.214***		.216**	.210***		.209***
	R^2 CF	.702	.726	1.02	.729	.424	.720
	R^2 IQ	.748	.825	.691	.748	1.15	.746
	R^2 TRU	.748	.685	.756	.803	.671	.770
	R^2 COM	.521	.481	.608	.652	.577	.429
	R^2 SAT	.785	.851	.861	.861	.786	.816
	R^2 COL	.614	.669	.832	.705	.774	.456
	CMIN/DF	1.924		1.338			
	p	.000		.002			
	NFI	.957		.927			
	RSMEA	.030		.022			

Notes: † In the structural model, –> are regression weights and <–> are correlation coefficients; in the measurement model <– are factor loadings, –> are regression weights and <–> are correlation coefficients. R^2 are squared multiple correlations in the structural model and communalities in the measurement models.

‡ See Figure 2 and Appendix A for full variable names.

*** (**, *) means statistically significantly different from zero at the 99% (95%, 90%) confidence level. Only significant parameters are reported.

+ Parameter was constrained to 1 before estimation, thus no significance levels are available.

Source: Authors' estimations from survey data.

