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Managing Sustainable Agri-food Chain Relationships – Factors Affecting Relationship Quality and Stability Dimensions

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Abstract

In the globalised business environment in which today's companies operate, building sustainable inter-enterprise relationships (SIRs) has become a key source of competitive advantage for all types of business systems (e.g., value or agri-food chains). Previous empirical work has shown that aggregate relationship sustainability is a function of effective communication, the existence of personal bonds, equal power distribution between buyers/suppliers and the exit of key people. However, so far it has been unknown how these determinants affect SIR components individually. This paper's new empirical results show that with regard to relationship quality, trust seems to be the most crucial component, taking the role of a powerful mediator. However, trust is much more of an issue at the farmer-processor stage than in the processor-retailer relationship. In the latter, effective communication seems to be more important. Effective communication is also the main determinant of relationship stability, holding an important mediation role, too. The suggested framework can help managers to better understand what sustainable relationships are and how to improve unsustainable ones.

Keywords: agri-food chains, business relationships, Europe, structural equation modelling

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Introduction

During the last decades, the concept of (global) value chains – a common business system type – has been heavily promoted and applied as a means of fostering agricultural development, and in particular of linking farmers to markets (Webber, 2008; Will, 2008; GTZ, 2007; Jenkins et al., 2007; Humphrey and Memedovic, 2006). However, much less attention has been given to the question of how actually to enable enterprises (firms, farms, etc.) to integrate effectively and efficiently into global and local agri-food value chains. Being part of a vertical business alliance (i.e., a group of knowledge-sharing but independent enterprises organised in a non-hierarchical way) poses considerable management challenges. In particular, chain integration requires from farmers, food processors and grocery retailers to develop and maintain close and sustainable business relationships with their buyers and/or suppliers.

Sustainable inter-enterprise relationships (SIRs) can be defined as high-quality and stable corporate relationships which are responsive to changing business environments and which business partners continue as long as the benefits derived from a relationship outweighs the costs of maintaining it (Fischer and Reynolds, forthcoming). Relationship quality reflects the overall mean outcome of a sequence of commercial transactions/interactions which make up a B2B relationship while relationship stability refers to the inter-temporal fluctuations characterising these transactions/interactions. Relationship quality is made up of inter-personal factors, such as commitment to, satisfaction with and trust in a business partner. Relationship stability considers non-coercive and coercive behaviour and past chain experiences, as indicated by the existence of mutual dependence, conflict resolution capacity and a positive collaboration history among business partners.

In practice, different business partners put different weights on different relationship dimensions. For example, trust may be a "competitive advantage" (Beth et al., 2006) in relationships, but in some commercial relations it may simply not exist (Cox, 2004). It has also been argued that relationships can be unsatisfying but stable (Backhaus and Büschken, 1999). While research has been done on factors affecting relationship sustainability (or "goodness") overall (Fischer et al., 2008), it is less clear which factors influence the different dimensions of relationship quality and stability individually. Obviously, for the practical management of relationships it is important to know how to enhance a particular relationship dimension (e.g., trust), if this dimension is perceived to be especially important in a particular relationship.

The aim of this paper is to generate insights into the main factors affecting the different dimensions of relationship quality and stability. In particular, it is aimed at the:
- identification of the different factors, and their strength of impact, influencing relationships quality dimensions (i.e., commitment, satisfaction and trust);
- identification of the different factors, and their strength of impact, influencing relationships stability dimensions (i.e., mutual dependence, conflict resolution capacity and a positive collaboration history);
- derivation of practical management implications and recommendations which arise from the empirical findings.

For this purpose, an empirical analysis of survey data obtained from 1,442 farmers, food processors and retailers in two commodity chains (meat and cereals) and across six different EU countries (Germany, UK, Spain, Poland, Ireland, Finland), collected in 2006/07, is undertaken. The data analysis uses structural equation modeling techniques. Where appropriate, mediation effects between regressors are considered.

This paper's structure is as follows. After this introduction, first the foundations of inter-enterprise relationships are explored and the SIR construct is defined. Then previous empirical studies, using the SIR construct, are reviewed. The following section reports new empirical results on determinants of individual SIR components. The last section discusses the findings and concludes.
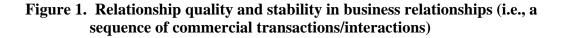
Theoretical foundations: defining sustainable agri-food chain relationships[2]
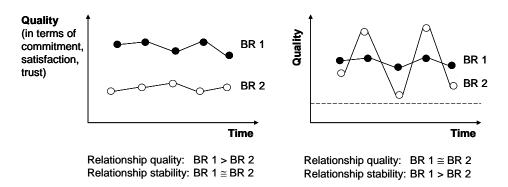
A common definition of business relationships is: "a series of market transactions and business-related interactions between a seller and a buyer which are not accidental. 'Not accidental' means that there are reasons for both parties which make a planned linking of market transaction meaningful. It also means that there is an 'internal connection' between the transactions" (Plinke, 1989). From this definition, the special characteristics of business relationships can be derived (Kleinaltenkamp and Plinke, 1997): (1) a sequence of market transactions and other business-related interactions; (2) an existing internal link between the individual transactions; (3) sellers must engage in investments in order to create and maintain the relationship.

However, here, the primarily concern is not with inter-enterprise relationships per se but with *sustainable* business-to-business relationships. Sustainability itself is a characteristic of a process or state that can be maintained, kept in existence or prolonged. Thus, SIRs are stable relationships of high quality which are responsive to changing business environments and which business partners continue as long as they are willing to do so. This does not mean that business relationships cannot be interrupted or terminated. The point is that SIRs end on good terms, so that they (potentially) may be continued at a later stage. In order to maintain the willingness of business partners to sustain a relationship, or continue one after an interruption, the relationship must possess certain favourable characteristics.

Key characteristics of SIRs are relationship quality and relationship stability. Relationship quality is made up of inter-personal factors, such as commitment, satisfaction and trust with a business partner. Relationship stability considers non-coercive and coercive behaviour and past chain experiences. Relationship stability is defined by the existence of mutual dependence, conflict resolution capacity and a positive collaboration history with a business partner. Relationship quality and stability are interrelated and together form sustainable relationships. Before the mentioned characteristics are discussed in more detail, first the different nature underlying relationship quality and relationship stability is illustrated using a graphical model.

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[2] This section is based on Fischer and Reynolds (forthcoming).

Figure 1. Relationship quality and stability in business relationships (i.e., a sequence of commercial transactions/interactions)

Relationship quality: BR 1 > BR 2
Relationship stability: BR 1 ≅ BR 2

Relationship quality: BR 1 ≅ BR 2
Relationship stability: BR 1 > BR 2

Source: author's draft

Figure 1 displays two business relationships (BR 1 and BR 2) as inter-linked sequences of transactions/interactions. In addition to the temporal positioning of each transaction/interaction (on the abscissa), each transaction/interaction is also located vertically (on the ordinate) according to its quality (in terms of satisfaction, commitment and trust). The mean across all transactions/interactions during a certain period reflects the overall quality of a relationship. Thus, in the left panel of Figure 1, BR 1 is characterised by an overall higher level of relationship quality than BR 2. Relationship stability may be interpreted as the degree of inter-temporal quality fluctuations. The larger these fluctuations, the lower the overall stability of a relationship. Thus, in the right panel of Figure 1, BR 1 is characterised by a higher level of relationship stability than BR 2, although their overall quality level (the mean across all transactions/ interactions) is about the same. Both relationship quality and stability determine the sustainability of a business relationship. Relationships where the overall quality is low may not be expected to last long. Relationships which are characterised by strongly fluctuating transaction quality may also not be sustainable. In particular, if there is something like a minimum expected quality level (the dashed line in the right panel of Figure 1), a relationship may break once a transaction/interaction has yielded a clearly unacceptable quality level.[3]

Theoretical foundations of relationship theory

The roots of relationship theory can be traced back to early Greek philosophy (Aristotle) and the concept of a relation or relationships between creatures both natural and social (animals, people, organisations, states, etc.) is fundamental in science (see Rychlak, 1984 for a discussion). Since relationships are generally defined as a relatively long-term association between two or more people, the concept is in particular of relevance in social science such as sociology and psychology. One can distinguish between inter-personal relationships and inter-group relationships but hybrid forms (e.g., an individual has a relationship with a company) are also possible. Inter-group relationships are thought to be more formal and handled on a more professional and rational (i.e., less emotional) basis (Lambert and Knemeyer, 2006).

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[3] A stable relationship does not mean it is 'static'. Transaction quality fluctuations in relationships can be considered as normal – but clearly among most partners these 'up and downs' must be within limits, in particular above a lower threshold.

Different social-science theories have dealt with relationships. Psychological attachment theory has argued that humans follow a fundamental drive to start and maintain social interactions with others and thus have a basic need for both stable and satisfying relationships (Baumeister et al. 1995). If either of these two components is missing, people will begin to feel anxious, lonely, depressed and unhappy. Social exchange theory defines relationships in the context of exchanged benefits. Relationships are judged in terms of obtained rewards relative to the potential benefits to be expected from alternative relationships (Blau, 1964). However, equity theory (Adams, 1965) has suggested that people care about more than just maximising rewards and also want equity and fairness in their relationships. In particular this theory postulates that people strive for equity between the inputs which they contribute to a relationship (e.g., time, commitment, effort, etc.) and the outcomes (rewards/satisfaction) which they receive from it (such as friendship, love, commercial benefits, etc.). Newer developments have refined equity theory (Carrell and Dittrich, 1979) and extended it (Huseman et al., 1987) but the fundamental proposition has remained unchanged.

The SIR construct which is discussed in the following is based in these theories. However, the focus is on inter-group (i.e., inter-enterprise) relationships as discussed in the business, management, marketing and economics literature. Here, relationships are usually treated as constructs, i.e., potentially multidimensional, complex concepts which usually cannot be directly observed. Finding a definition for such constructs is firstly about agreeing on its components. Second, in particular in the case of multidimensional constructs, additional attention has to be given to theoretically specifying the relations between a construct's dimensions (Law et al., 1998). Finally, when dealing with a construct empirically, measurement-related issues need to be clarified (e.g., determining the relative importance each individual component should hold within the larger compound).

Relationship quality

The quality of business relationships has been the focus of numerous recent studies. As a counterpoint to hard chain performance measures, such as return on investments or costs, the quality of relationships, while difficult to measure, can provide further insights into the well-functioning of corporate cooperation arrangements. Roberts et al. (2003) review many of these studies. From this review, the finding arises that satisfaction (gratification with another party), commitment (an engagement, voluntarily or by contract, towards another party) and trust (the belief in the fulfilment of obligations by another party) are important components of relationship quality, used in most studies. Relationship quality can therefore itself be seen as a three-dimensional construct, incorporating commitment, satisfaction and trust (see, for instance, Ivens (2004) for an empirical application involving this construct).

Commitment

Following psychological equity theory, relationships need continuous 'inputs', or 'investments' to sustain them. Different types of relationships may require different forms of inputs but commitment is important in most relations.

A general definition of commitment is the act of binding oneself (intellectually or emotionally) to a course of action and feeling dedicated or loyal to a longer-term

endeavour (Morgan and Hunt, 1994). Commitment can take the form of an informal promise or of a formal pledge (e.g., a contract). In the context of inter-enterprise relationships commitment can be defined as cooperative sentiments and existing affinity for the exchange partner with a preference for the continuation of the business relationship (Young and Denize, 1995). Another definition sees commitment as a tacit or expressed confession to support the persistence of the business relationship between business partners (Wetzels et al., 1998).

The importance of commitment in inter-enterprise relationships results from the fact that highly committed chain actors 'stick' to the relationship and are less inclined switching to other business partners (Barnes et al., 2005). Commitment improves the sustainability of relationships since business partners are more likely to continue to work with their exchange partner.

Two general perspectives on commitment co-exist in the literature: (i) manifest (behavioural) commitment and (ii) attitudinal commitment (Morgan and Hunt, 1994; Wetzels et al., 1998). Attitudinal commitment comprises affective dimensions which influence the sense of unity. It can be understood as the inner psychological state of managers – i.e., their sensation of dedication and attachment to their business partners. Manifest commitment resembles a rational willingness to conduct business on the basis of verbal or written contracts and whether a relationship is commercially reasonable (Wetzels et al., 1998). This means that a business partner may behave committed and continue to do business with the exchange partner as long as it is financially fruitful, however may not feel emotionally attached.

Satisfaction

Psychological equity theory also stresses the importance of rewards in well-functioning relationships. Different types of relationships offer different 'outcomes' or benefits but whatever their exact nature, they need to translate into 'satisfaction' for the involved relationship parties.

Satisfaction is the feeling of contentment and gratification arising when needs or desires have been fulfilled. Satisfaction also can be understood as a positive psychological state and response to the results of an evaluation process (Giese and Cote, 2000). In this evaluation process, individuals or businesses assess to what degree their expectations have been met. Meeting or exceeding expectations is important for the sustainability inter-enterprise relationships since it significantly influences the decision of the exchange partners to continue their business relationship (Selnes, 1998).

Two sub-dimensions of the evaluation of the fulfilment of expectations exist: an affective social-emotional and a cognitive economic-rational one (Geyskens and Steenkamps, 2000; Ivens, 2004). The social-emotional component refers to how business partners emotionally perceive their expectations have been met by evaluating personal interactions and behaviour. Expectations refer here to factors such as being treated as equal, commitment of the seller and non-opportunistic behaviour. Economic-rational satisfaction requires a specific level of knowledge about prices and products to assess if the economic outcomes meet ones own financial, economical expectations. Economical expectations can relate to product quality, price and service. Business

relationships should meet or exceed both expectation dimensions, the affective emotional and cognitive rational component, to satisfy partners. Even if customers are economically satisfied with the performance of their suppliers, they may not feel that their social interactions are gratifying and therefore switch their supplier (Bennett and Rundle-Thiele, 2004).

Trust

Trust in business relationships is of a different nature to commitment and satisfaction which are rooted in psychological equity theory. Trust may be neither a relational 'input' nor 'outcome' but it has been characterised as a "safeguard mechanism" (Dyer and Singh, 1998), serving as an efficient facilitator for the involved parties to receive from the relationship what they expect. In a commercial relationship, the existence of trust between exchange parties may not strictly be necessary since other safeguard mechanism such as contracts can be used. However, designing effective contracts may result in significant additional (transaction) costs, thus potentially making a relationship less sustainable. In a true 'collaborative' and sustainable inter-enterprise relationship, trust is a powerful commercial asset (a "competitive advantage", Beth et al., 2006), even if it may only develop over time.

Generally speaking, trust is the inter-personal reliance gained from past experience which requires a previous engagement on a person's account, recognising and accepting that risk exists (Luhmann, 1988). That is, trust is a rational, experience-based concept, which is created, reinforced or decreased by bilateral, relational activities in a series of encounters.

In the business context, trust can be an important prerequisite for commercial exchange. When goods are not traded on spot markets (i.e., the immediate swapping of goods against cash, after on-place inspection of the wares), trust in business partners is necessary as to whether they keep their promises (i.e., deliver the ordered goods in the agreed quality and quantity; or that payments are made as agreed). Trust has become increasingly important in business during the last decades given that commercial transactions nowadays take place in a global context. That is, business parties may not know each other personally and completely new trading infrastructures (e.g., e-commerce platforms) have emerged. Furthermore, products have become increasingly complex (e.g., the rising significance of "credence" attributes for food products) implying increased information asymmetries between producers and consumers.

In collaborative inter-enterprise relationships, trust is therefore considered as a crucial component (Morgan and Hunt, 1994; Svensson, 2005), mostly because a lack of trust can have severe cost implications. If business partners can trust each other, contractual arrangements may be reduced or avoided, thereby implying lower costs (Chiles and McMackin, 1996) and thus securing competitive advantage. In particular, transaction cost theory suggests that trust has the important effect of lowering opportunistic behaviour and hence exchange and agency costs. Chen (2000) shows that trust is widely relied on in transactions involving relatively low monetary value and considerable resources are sometimes used in structuring contracts when the transactions involved have a relatively high monetary value.

Given these cost implications, trust is frequently defined as a willingness to take risks (Mayer et al., 1995; Williamson, 1993). Trust is warranted when the expected gain from placing oneself at risk by another is positive, and the decision to accept such a risk is taken to imply trust (Williamson, 1993). Trust in business relationships therefore requires accepting the danger of relatively small financial losses in order to avoid comparatively large costs which would arise from hedging against these losses. One way to hedge the risk of financial losses in business relationships can be the use of contracts. That is, if business partners do not trust each other they can close a contract. This implies that trust and contracts are substitutes. However, when the assets at stake are high (i.e., the potential financial losses large), business partners may prefer a contract even if, in principle, they trust each other. With contract costs then being small relative to the involved sums – and given these large sums, incentives to behave opportunistically are high – a 'better-safe-than-sorry' strategy may be the most rational option. In such a case, trust and contracts become complements. More specifically, since most contracts are incomplete, trust and contracts sometimes must co-exist, with the former being the more important the less complete the latter are.

Hence, trust in business relationships relates to the belief into the ability of a business partner to fulfil his/her business commitments (Wong and Sohal, 2002), and thus to be able to rake the expected rewards. In order to assess this ability, business people are often asked to make inference, based on previous experiences with a business partner. Thus judgements are usually made about a business partner's honesty, integrity, sincerity, competence, reliability to keep promises, his/her concerns/considerations about other business partners' interests, or his/her general responsibility. (See Kwon and Suh, 2004; Batt, 2003 for collections of commonly used statements).

The inter-relationships between satisfaction, commitment and trust

The internal links between commitment, satisfaction and trust are not clear cut, although many studies find that these relationship properties are often associated with each other. For instance, it has been shown that companies may trust their partners more if previous exchanges have been satisfactory (Selnes, 1998; Bigne and Blesa, 2003). Other studies have revealed some influence of customer satisfaction on customer commitment, or vice versa (Bennett and Rundle-Thiele, 2004; Dorsch et al., 1998; Rossomme, 2003). In addition to commitment being interrelated with satisfaction, commitment has also been found to influence and being influenced by trust. In inter-enterprise relationships, buyers' commitment increases when they perceive that they can trust their seller.

Despite a potential ambivalence of some empirical results, the discussion above depicts that inter-enterprise relationships can only be sustainable if they are characterised by both relatively high levels of commitment and satisfaction. In addition, in sustainable relationships trust between transaction partners is a necessity or at least a strong asset. From this we postulate that in practice at least a strong positive correlation between these relationship dimensions will exist.

Relationship stability

In the marketing literature, a comprehensive set of studies focus on relationship quality or chain performance issues. However, some aspects of inter-enterprise relationships are commonly neglected, such as the degree of dependence between exchange partners,

previous interaction episodes, and relationships' susceptibility to conflicts – hence, stability issues. Other studies, which tend to descent from the management literature, often solely deal with the stability of relationships. From a systematic review of these studies a typical components of relationship stability can be identified: mutual dependence (arising, for instance, through the existence of switching costs or asset specificity); conflict resolution capacity (the ability to endure and solve relationship problems); and positive collaboration history (the assumption that a relationship which has been successful in the past may be prolonged and continued).

A direct assessment of the stability of a relationship would require acceptably accurate records of past transaction/interactions outcomes. In practise, such records rarely exist. Asking managers to recall complete transaction/interaction episodes would be unrealistic, in particular if relationships have been existing for a long period of time, are characterised by a high transaction/interaction frequency, and/or are handled by several people simultaneously (e.g., as done in purchasing departments of large corporations). For these reasons, an indirect and more feasible way to assess relationship stability, and one which is conceptually similar to the one used for relationship quality, needs to be applied.

Mutual dependence

Mutual dependence builds upon bi-directional perceptions of how individuals or businesses feel they rely on their exchange partner(s) to achieve a goal. Mutual dependence fosters collaborative attempts to create a win-win situation for the involved parties (Svensson, 2002). Therefore, inter-enterprise relationships have been shown to move away from autocratic hierarchical structures to more cooperative partnerships characterised by mutual dependence between the exchange partners (Cox and Makin, 1994; Hu and Watkins, 1999).

The acknowledgement and consideration of mutual dependence in inter-enterprise relationships is essential (Svensson, 2002). Businesses which are not aware of dependence structures in their relationships may be brought into a disadvantageous position if they neglect the fact that they are more dependent on their partner(s) than vice versa. On the other hand, enterprises which recognise that mutual dependence exists may have a better basis for negotiation.

The creation of mutual dependence can occur in multiple ways. Compatible technical standards, the adaptation of processes and know-how sharing can create mutual dependence between partners, as well as personal bonds, important time-periods or contracts (Hakansson and Snehota, 1995).

Mutual dependence involves switching costs for both involved exchange partners when the relationship is terminated. Metge and Weiss (2008) differentiate switching costs into monetary and non-monetary (psychological) costs. Monetary costs arise when a mutual financial dependency exists which was created through specialised financial investments. When the relationship is terminated, the investments may become sunk costs (Burnham et al., 2003). Mutual dependence, based on personal bonds or social coherences, generates non-monetary switching costs which include social costs of terminating personal relationships and searching and conducting new relationships

(Metge and Weiss, 2008). For instance, long-existing family businesses, may have built personal bonds to their suppliers or buyers. Switching may then be perceived as an emotional barrier. Also, the necessity of gathering information and educational requirements for building a new relationship may construct a non-monetary barrier (Bhattacharya and Bolton, 2000). Thus, mutual dependence implies non-monetary and monetary switching costs which create coercive barriers towards disruption or termination of relationships even in critical phases of the relationship.

Conflict resolution capacity

Conflicts can be understood as unsettled differences in opinions, leading to dispute between two or more parties. Conflicts in business relationships arise through product- or process-stream problems, dependencies on assets, non-conciliatory networks or unforeseen events in the natural and social environment (Peck, 2005). The intensity and frequency of these conflicts can vary depending on the nature of the relationship but are necessarily meaningful for the sustainability of inter-enterprise relationships. More important than measuring the intensity and frequency of conflicts is the effectiveness of how problems are handled – i.e., the degree of existing conflict resolution capacity (Anderson and Narus, 1990).

Five different methods of conflict resolution are discussed in the management literature (McKenna and Richardson, 1995): (i) competitive – dominating the exchange partner for one's own needs; (ii) neglecting – avoiding the fact that a conflict exists; (iii) accommodation – appeasing the exchange partner while maximising ones own benefits; (iv) compromise – sharing what is available without finding a solution; and (v) collaborative behaviour – finding a solution together. Conflict resolution capacity also depends on national and business cultures, such as differences in behaviour to avoid uncertainty (Mello and Stank, 2005).

For the stability of inter-enterprise relationships, collaborative behaviour is essential. If conflicts are not solved jointly or are neglected, the chain relationship may be terminated prematurely. Buyers and suppliers who recognise their mutual dependence conduct cooperative strategies to resolve conflicts to a higher degree than relationships with a competitive behaviour (Wong et al., 1999). In this regard, Sachan et al. (2005) review relationships of agri-food supply chains in India and identify powerful intermediaries as a source for conflicts leading to high transaction costs. The authors then project different interaction models, such as competitive and collaborative models, in optimistic and pessimistic future scenarios. They conclude that the most sustainable relationship models are characterised by collaborative behaviour leading to lower supply chain costs for all stakeholders.

Positive collaboration history

Collaboration (i.e., interaction) between businesses can be of indirect or of direct nature. Businesses may either interact indirectly by sharing a common infrastructure (e.g., market) or collaborate directly through establishing contact with a potential partner and receiving a reaction. Here, we focus on such immediate bi-directional interactions.

Collaboration history comprises all positive and negative experiences made with the exchange partner and is used as a basis for deciding on future actions with the exchange

partner. When companies transact for the first time, they commonly have no experience with an exchange partner and are limited in their evaluation possibilities (e.g., with regard to a partner's trustworthiness). While this may not be important for arm's-length transactions, such as in spot markets, adverse selection can cause severe hold-up problems and critical phases in longer-term relationships. Companies which have a positive collaboration history are characterised by commercially rewarding transactions, ideally for all involved stakeholders, successful productive endeavours and critical phases which have been endured and successfully resolved. Thus, a positive collaboration history contributes to the stability of relationships by reducing the probability of partners switching (Bejou et al., 1996; Anderson and Weitz, 1989).

Life-cycle models describe the typical development history of relationships. In theory, good relationships could continue endlessly as long as they are perceived of being rewarding and conflicts are resolved. However, more realistically, life-cycle models assume some kind of termination stage for a relationship. The models typically consist of three to five different stages, which include a 'birth' stage (i.e., the beginning of a relationship) and a 'death' stage (Dwyer et al., 1987). These models reflect an ideal and linear development of a relationship. In practice, relationships must not necessarily follow this strict progression.
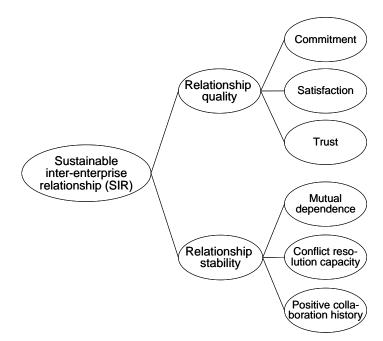
The real life of a business relationship comprises routine and critical episodes (Storbacka et al., 1994). Routine episodes are phases where behaviour and processes are mostly standardised and formalised. These episodes require only a low degree of mental involvement of the related parties (Storbacka et al., 1994). In contrast, critical episodes are highly disruptive and difficult to handle. Companies in stable, long-lasting relations usually can look back at a chain history in which one or more critical episodes have been outlived and which at the same time is characterised by the existence of routine problem-solving processes.

For the assessment of collaboration history, survey items typically enquire about respondents' experiences with their business partners (i.e., whether the past has been a success or not). Sometimes it is also assessed whether a relationship is a long-term alliance and how the continuation of the relationship is handled (e.g., by automatic contract extension due to a positive performance in the past).

Summary

In summary, Figure 2 depicts the components of the proposed aggregate multidimensional SIR construct graphically.

Figure 2. The SIR construct

Source: author's draft

Review of previous empirical findings

In the following, previous findings on European agri-food chains, using the above described SIR construct are reviewed. The data collection process has been described elsewhere (Fischer et al., 2008). In short, the data were collected from November 2006 to April 2007 in six different EU countries (Germany, UK, Spain, Ireland, Finland and Poland), for three different agri-food chains (pig meat, beef and cereals) and two different chain stages (upstream: farmer-processor, and downstream: processor-retailer). In total, the surveys yielded 1,442 usable responses. Structural equation modelling (SEM) has been used for analysing the collected data. This statistical technique has also been described in more detail in Fischer et al. (2008).

General results
Figure 3 reports the final pooled SEM estimation results. These results are discussed more substantially in Fischer et al. (forthcoming). The model depicts the main influence factors that determine SIRs in European agri-food chains. The model fits the data quite well, with all goodness-of-fit measures above (below) the recommended acceptance levels. The deviation of the correlation structure as suggested by the specified model from the one observed in the data is not significant ($p = 0.07$), as it should be. Overall, 48% of the variance in the observed RS construct can be explained by the identified determinants.
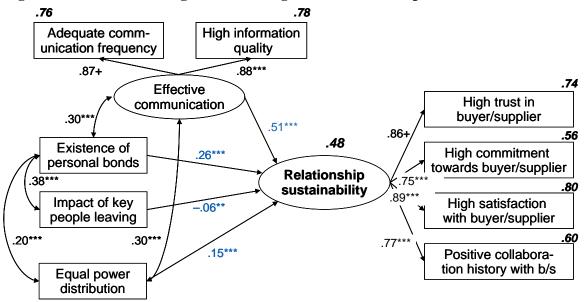
Figure 3. Factors affecting sustainable agri-food relationships

Notes: .00 = standardised estimated parameters; *** (**) statistically significantly different from zero at least at the 99% (95%) confidence level; + constrained parameter, thus no significance level available; **.00** = squared multiple correlations (R²); Model fit measures: CMIN/DF = 1.479 (p = .069); NFI = .994; RMSEA = .018; Sample size: 1,442 observations.

Source: Fischer et al. (forthcoming).

In the structural model, four variables have a positive and statistically significant impact on the RS construct: effective communication, the existence of personal bonds, the impact of key people leaving, and equal power distribution between buyer and supplier. The most important contributor to the sustainability of a chain relationship is effective communication (with a standardised regression weight of 0.51). This outcome confirms the results of other research, which sees communication as the most important factor in achieving successful inter-enterprise cooperation (Bleeke and Ernst, 1993; Mohr et al., 1996). The existence of personal bonds (0.26) is the second most important RS determinant. Equal power distribution between business partners (0.15) is the third. Finally, the variable 'key people leaving' has a significant negative impact, though to a lower degree (–0.06).

Looking at regressor interdependencies, the existence of personal bonds and the impact of key people leaving are positively and statistically significantly correlated with each other. This suggests that to a large extent key people are those who also develop personal bonds with business partners. Moreover, the existence of personal bonds, equal power distribution and effective communication are all positively and significantly correlated with each other.[4] Thus the existence of personal bonds

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[4] All regressor correlations have been carefully tested by considering their significance levels and the impact on model fit when leaving them away. The correlations between the impact of key people leaving and effective communication and equal power distribution have been found to be insignificant. This makes sense from a theoretical point of view: there is no reason to believe that when key people leave a company the power distribution between that company and its buyer or suppliers changes. There could

contributes to effective communication; equal power distribution contributes to the development of personal bonds and to effective communication, and vice versa.

In the measurement models, the reflectively specified constructs 'relationship sustainability' and 'effective communication' perform well, with all factor loadings being above the recommended levels of 0.60 and all communalities also being equal or larger than 0.60 (except for the commitment item, which is 0.56). In the SIR construct the most important components are satisfaction and trust. In the 'effective communication' construct both components (adequate communication frequency and high information quality) are equally important.

Chain stage-specific results
The general estimation results just described can be disaggregated into specific results for individual chain stages. The chain stage-specific estimates (Table 1) yield a model fit which is even slightly better than the one from the general SEM. However, the differences in the estimated coefficients reveal interesting specificities within the investigated agri-food chains.

At the farmer-processor stage, effective communication (0.49) is the most important relationship sustainability determinant, followed by the existence of personal bonds (0.29), equal power distribution between business partners (0.15), and the negative impact of key people leaving. Taken together, these four determinants explain about 48% of the variance in the relationship sustainability score. These determinants are also positively and significantly correlated with each other. The measurement models reflect the general situation with satisfaction and trust being the most important components in the relationship sustainability construct, and communication frequency and information quality being equally important in the effective communication construct.

At the processor-retailer stage, there are only two significant determinants of relationship sustainability: effective communication (0.62), and equal power distribution (0.14). Taken together, these two determinants explain about 50% of the variance in the relationship sustainability score. Nevertheless, all four considered determinants are positively and significantly correlated with each other, indicating that in particular effective communication is improved by the existences of personal bonds and an equal power distribution between business partners. The involved measurement models are very similar to the one estimated for the farmer-processor stage.

Overall, it becomes clear that the existence of personal bonds (and the impact of key people leaving) do not seem to be important at the processor-retailer chain stage, but effective communication is crucial. Equal power distribution is however similarly important at both chain stages.

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be a deterioration of effective communication as a result of key people leaving, however, there is likely to be a time lag and this was not captured in the way the data were collected.

**Table 1. Chain stage-specific SEM estimation results – standardised parameters†
and significance levels**

		Farmer-processor (*n* = 1,086)	Processor-retailer (*n* = 344)
Structural model	Effective Communication –> Relationship Sustainability	.49***	.62***
	Personal Bonds –> Relationship Sustainability	.29***	.10*
	Key People Leaving –> Relationship Sustainability	–.07**	
	Equal Power Distribution –> Relationship Sustainability	.15***	.14**
	Effective Communication <–> Personal Bonds	.29***	.29***
	Effective Communication <–> Equal Power Distribution	.29***	.23***
	Personal Bonds <–> Key People Leaving	.38***	.38***
	Personal Bonds <–> Equal Power Distribution	.19***	.22***
	*R*² Relationship Sustainability	**.475**	**.499**
Measurement models	Communication Frequency <– Effective communication	.86+	.90+
	Information Quality <– Effective communication	.87***	.91***
	Trust <– Relationship Sustainability	.87+	.80+
	Commitment <– Relationship Sustainability	.74***	.72***
	Satisfaction <– Relationship Sustainability	.89***	.87***
	Collaboration History <– Relationship Sustainability	.77***	.78***
	*R*² Communication Frequency	.742	.801
	*R*² Information Quality	.761	.826
	*R*² Trust	.755	.647
	*R*² Commitment	.551	.519
	*R*² Satisfaction	.799	.752
	*R*² Collaboration History	.589	.603
Overall fit	CMIN/DF	1.349	
	p	.061	
	NFI	.989	
	RSMEA	.016	

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.

*** (**, *) 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: author's estimations from survey data.

These results help to understand of how to better manage relationships. However, they provide little guidance if the interest is in how to improve individual SIR dimensions.

Therefore, a detail empirical analysis is presented in the following where the dependent variable is not the SIR construct but it different sub-dimensions.

Factors affecting individual relationship dimensions

The theoretical discussion above highlighted that there is no consensus on the inter-relationships between commitment, satisfaction and trust. That is, it is not clear whether these relationship components are merely correlated or whether there are important causality links between them. Yet, in any case, correlation is a necessary condition for causality even if not a sufficient one. There is currently no established theory which postulates specific causality links between the three mentioned relationship stability dimensions. Therefore, empirical estimations will be used to explore potential causality links between the components, guided on SEM fit statistics. That is, the model with the best fit statistics will be taken as an indicator for a potential causality link. However, it cannot be claimed that the presented models are the only ones which fit the data. Nor can it be claimed that they are a complete description of the phenomena under investigation. The analyses were conducted on the basis of cross-section data and some of the estimation results may be different in the case of longitudinal data. Furthermore, given the non-experimental, cross-sectional design, proof of causation cannot be fully established. All that can be said for sure is that the analysed data are not inconsistent with the causal relationships hypothesised and depicted. However, what can be claimed is that the presented models are the ones which best fit the data, among the many alternative specifications which are theoretically permissible and which we have tested.

Relationship quality
Figure 4 depicts the results when the model described in Figure 3 is estimated for the individual relationship quality indicators, treating them as potentially endogenous and/or as independents. Using such a model specification for the pooled dataset (i.e., non-chain stage-specific), the best model fit statistics that can be obtained (CMIN/DF = 8.054 (p = .000); NFI = .976; RMSEA = .070) are considerably worse than when the SIR construct is used as a dependent variable. Nevertheless, when using this model as a starting point, subsequent chain stage-specific estimated SEMs yield a satisfactory model fit. In addition, the estimated R^2s are comparatively high and all of the estimated coefficients are highly significant in Figure 4. For these reasons, this model is considered as acceptable and discussed in the following.

The main finding arising from this SEM is that Effective Communication mostly helps to build Trust in a buyer/supplier relationship (standardised regression weight of .46). Trust in turn strongly increases Commitment (.57) and Satisfaction (.49). Thus, Trust is a powerful mediating variable which helps to reinforce the weaker direct effect which Effective Communication has on Commitment and Satisfaction. Commitment in turn also strengthens Satisfaction, but the effect is smaller (.28). Simplifying and summarising, the following line of causation may be postulated:

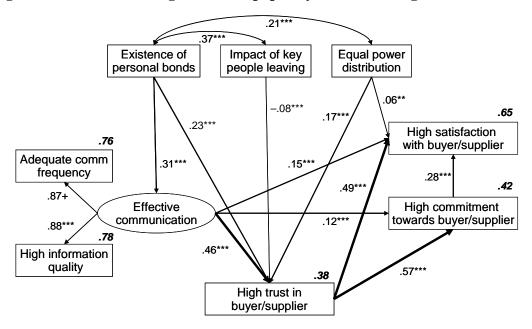*Effective Communication –> Trust –> Commitment –> Satisfaction*

Figure 4. Factors affecting relationship quality dimensions – general

Notes: .00 = standardised estimated parameters; *** (**) statistically significantly different from zero at
       least at the 99% (95%) confidence level; + constrained parameter, thus no significance level
       available; **.00** = squared multiple correlations (R²); Model fit measures: CMIN/DF = 8.054 (*p* =
       .000); NFI = .976; RMSEA = .070; Sample size: 1,442 observations.
Source: author's estimations, compiled from survey data.

Looking at the other exogenous variables, Personal Bonds only enhances Trust. It also
enhances communication effectiveness, which turns Effective Communication into a
mediator, too. The negative impact of Key People Leaving is solemnly on Trust (–.08).
Equal Power Distribution enhances Trust (.17) and to a smaller extent Satisfaction (.06).
This again highlights the crucial role of trust in agri-food chain relationships.
Nevertheless, despite this central role the specified model is only capable of explaining
about 40% of the variation in the trust variable. Other factors therefore need to be in
play that have not been considered in this model. Commitment is also explained to
about 40% in this SEM while the variation in Satisfaction is accounted for to 65%. The
bivariate correlations and measurement model statistics are similar to the general model
(Figure 3) and are therefore not discussed in further detail here. Simplifying and
summarising again, the following causation patterns may be proposed:

Effective Communication –> Trust, Satisfaction, Commitment
Personal Bonds –> Trust (Effective Communication)
Key People Leaving –> Trust
Equal Power Distribution –> Trust, Satisfaction

Figure 5 displays the specific estimation results for the farmer-processor chain stage.
The estimated model fits the data now much better (CMIN/DF = 3.822 (*p* = .000); NFI
= .977; RMSEA = .044). Yet, the estimated coefficients and R²s are fairly similar to the
overall results. The main difference is that there is no direct effect of Equal Power
Distribution on Satisfaction at this chain stage. Equal Power Distribution only has a
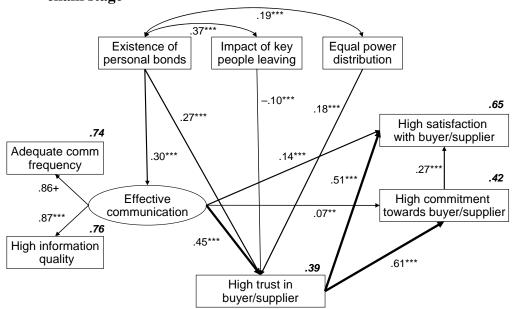strengthening effect on Trust.

Figure 5. Factors affecting relationship quality dimensions – farmer-processor chain stage

Notes: .00 = standardised estimated parameters; *** (**) statistically significantly different from zero at least at the 99% (95%) confidence level; + constrained parameter, thus no significance level available; **.00** = squared multiple correlations (R²); Model fit measures: CMIN/DF = 3.822 (*p* = .000); NFI = .977; RMSEA = .044; Sample size: 1,086 observations.
Source: author's estimations, compiled from survey data.

At the processor-retailer chain stage the estimation results are different as compared to the farmer-processor relationship. Between processors and retailers Effective Communication has a much larger positive effect on Commitment, while Trust has a considerably lower one. More generally, Trust seems to be less of an issue with fewer antecedents and an overall weaker impact on the other relationship quality components. On the other hand, Effective Communication has stronger effects on Trust, Commitment and Satisfaction. This implies that the mediating role of Trust is less important in the processor-retailer relationship as compared to the farmer-processor chain stage. This finding confirms the earlier results (Table 1) where Effective Communication had a stronger impact on the SIR construct and Trust a smaller factor weight within it at the processor-retailer chain stage.

Looking at the other exogenous variables, it becomes apparent that Key People Leaving does not seem to be a problem at the processor-retailer stage (perhaps because relationships are more professionally managed). Personal Bonds only enhance Effective Communication but none of the relationship quality components directly. (Again this is in line with the findings arising from Table 1.) Equal Power Distribution has a lower direct impact on Trust but does have one on Satisfaction (however, not at the farmer-processor stage). Simplifying and summarising, the following lines of causation may be postulated:

Effective Communication –> Trust, Commitment, Satisfaction
Personal Bonds –> Effective Communication
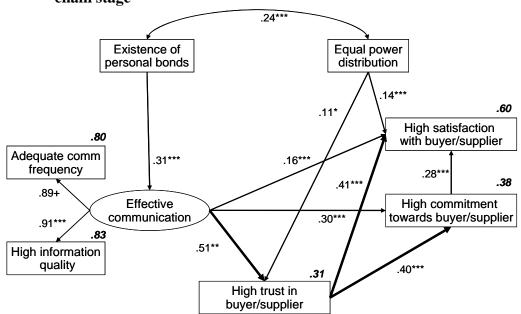*Equal Power Distribution –> Satisfaction, Trust*

Figure 6. Factors affecting relationship quality dimensions – processor-retailer chain stage
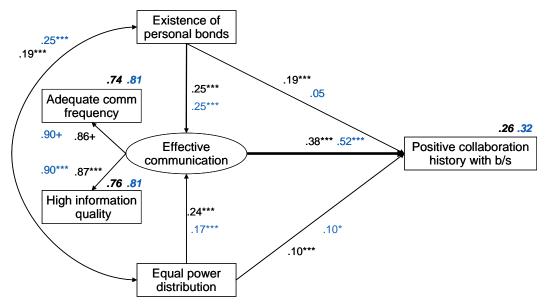

Notes: .00 = standardised estimated parameters; *** (**) statistically significantly different from zero at least at the 99% (95%) confidence level; + constrained parameter, thus no significance level available; **.00** = squared multiple correlations (R²); Model fit measures: CMIN/DF = 3.822 (*p* = .000); NFI = .977; RMSEA = .044; Sample size: 344 observations.
Source: author's estimations, compiled from survey data.

Relationship stability

The construct of relationship stability theoretically and empirically has been much less explored as discussed above. As a consequence the suggested measures in the literature have been less thoroughly tested in previous research. This may also be the reason why in the SIR construct in the general model (Figure 3) two measures of relationship stability had to be excluded on statistical grounds (the items did not fulfil the reliability criteria as, for instance, assessed by Cronbach's alpha). For reasons of comparability and consistency to the previous results (Figure 3), in the following only the relationship stability indicator Positive Collaboration History is used as a dependent variable.

The resulting SEM (Figure 7) is parsimoniously specified but yields a highly satisfactory model fit (CMIN/DF = 1.015 (*p* = .398); NFI = .998; RMSEA = .003.). The figure displays chain stage-specific estimates (black: farmer-processor, blue: processor-retailer) only. However, the aggregate (non-chain stage-specific) estimates are all in between the two stage-specific ones with every single one being statistically highly significant. Overall and stage-specifically, about 30% of the variance of the Positive Collaboration History variable is explained.

Figure 7. Factors affecting stability in agri-food relationships

Notes: .00 = standardised estimated parameters: farmer-processor (n=1,086); processor-retailer (n=344);
*** (*) statistically significant at least at the 99% (90%) confidence level; ***.00*** = squared multiple
correlations (R^2); Model fit measures: CMIN/DF = 1.015 (p = .398); NFI = .998; RMSEA = .003.
Source: author's estimations, compiled from survey data.

The most important determinant for relationship stability (Positive Collaboration History) is Effective Communication. This holds in both chain stages but the effect is even stronger at the processor-retailer chain stage. In the processor-farmer relationship the existence of Personal Bonds positively impacts on relationship stability, but it does not in processor-retailer relationships. Equal Power Distribution seems to be equally important for relationship stability at both chain stages but the estimate in the processor-retailer is only significant at the 90% confidence level. Both Personal Bonds and Equal Power Distribution enhance Effective Communication, thus turning it into a powerful mediating variable. In addition, Personal Bonds and Equal Power Distribution are also positively correlated thus reinforcing each other. Simplifying and summarising again, the following causation patterns may be proposed:

Effective Communication –> Positive Collaboration History
Equal Power Distribution –> Effective Communication, Positive Collaboration History
Personal Bonds –> Effective Communication, (Positive Collaboration History)

Discussion and conclusions

In the globalised business environment in which today's enterprises operate it has become an essential part to connect more closely with others, and above all with customers and suppliers. In other words, building sustainable relationships has become a key source of group (or chain) competitive advantage. As a consequence, business managers need to know what sustainable inter-enterprise relationships are and how they can be managed systematically in order to improve company and chain performance.

This paper has discussed the 'sustainable inter-enterprise relationship' (SIR) construct. It consists of a quality and a stability component. Relationship quality reflects the overall mean outcome of a sequence of transactions/interactions which make up a business-to-business relationship and is itself composed of the (i) perceived commitment of a business partner, (ii) satisfaction with that partner, and (iii) trust in the partner. Previous research suggests that these three components are interrelated with each other. Relationship stability refers to the inter-temporal fluctuations in the quality outcomes of business transactions/interactions and is composed of the (iv) degree of mutual dependence of the business partners, (v) extent of conflict resolution capacity and (vi) existence of a positive collaboration history with a business partner.

Previous empirical results quantifying the determinants on SIR have shown that effective communication, the existence of personal bonds, equal power distribution between buyers/suppliers and the exit of key people all have significant impacts on relationship sustainability as a whole. It has also been shown that these effects differ between different agri-food chain stages. However, so far it has been unknown how these key determinants affect SIR components individually. This knowledge gap has been addressed in this paper.

The new empirical analyses presented above show that with regard to relationship quality trust in a business partner seems to be the most crucial component, taking the role of a powerful mediator. While commitment and satisfaction within a B2B relationship are also directly enhanced by effective communication (and equal power distribution), trust indirectly reinforces the effects of communication, personal bonds and equal power distribution while buffering the negative impact of key people leaving on commitment and satisfaction. However, the chain stage-specific results show that trust is much more of an issue at the farmer-processor stage than in the processor-retailer relationship. In the latter, effective communication seems to be more important. The empirical results also reveal that high relationship satisfaction is ultimately a result of many, mutually reinforcing factors, in particular of trust, effective communication, commitment and (to a minor degree) equal power distribution. Personal bonds and the impact of key people leaving only indirectly affect the relationship quality components commitment and satisfaction. However, personal bonds are important for relationship stability, and in particular the here investigated component of a positive collaboration history with a buyer/supplier. This holds generally but is in particular true at the farmer-processor stage. Yet effective communication is again the main determinant of relationship stability, by holding an important mediation role. Equal power distribution has a minor impact on relationship stability.

Furthermore, it is now clear that personal bonds in business relationships mostly help to enhance (directly and indirectly) trust and relationship stability. This is interesting to find since business relationships – as inter-group relations – are generally thought to differ from inter-personal relationships because of the former's formality and supposed independence from individuals (Lambert and Knemeyer, 2006). It is therefore clear that in particular trust building in business relationship at least partly occurs also on a personal basis. This is reinforced by the finding that if key people leave, trust (and only trust) will be negatively affected. Together with the finding that personal bonds and key people leaving are positively correlated, this suggests that "key people" are those who

build personal bonds and when they leave business partners loose trust in the partner business. This is in particular an issue at the farmer-processor chain stage.

The main practical implications for business management arising from these findings is first, that the suggested framework can help to gain a better understanding of what sustainable inter-enterprise relationships actually are. Having a better understanding of such relationships allows for better managing them and thus to improve unsustainable ones. For example, if two companies have a relationship problem, the suggested SIR framework can help them to investigate whether it is actually a trust, commitment, satisfaction or stability issue. If it turns out to be a commitment issue then from the discussed models it is clear that commitment may be increased by improving trust and communication. If it is primarily a trust problem, then building personal bonds may help best. Satisfaction is more complex to increase but without enhancing commitment satisfaction may not be easy to improve. Stability, finally, seems to be a main function of effective communication and personal bonds.

Future research within this domain may more closely look at the role of trust in agrifood chain relationships. Here, the mediating role of this variable has been highlighted. However, this aspect could be explored in more depth and formality. There are statistical procedures (mediation tests) which can be applied for a more thorough investigation of the strength and significance of the postulated reinforcement/buffering effects.

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