Challenges of a Vertical Coordinated Agri-Food Business for Co-operatives

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Today, Raiffeisen co-operatives still play a key role in the German agri-food sector because of or despite their long history. Nevertheless, despite their present importance, questions about their future role in a changing agri-food business have to be raised. As a result of changes in the agri-food business a change within the vertical coordination can be seen, ie vertical coordinated systems have been established. Hence, the questions arise "what role can co-operatives play in such vertical coordinated chain systems" and "how can they deal with the related managerial challenges".

Introduction

The beginnings of co-operative groupings on German soil can be traced back to the Germanic tribes. The organisational form in which co-operatives were developed by German tribes was the kinship. The kin was not based on voluntary agreement, but had its roots in the blood relationship with the next of kin. The ultimate authority in these compulsory family associations which cultivated and used the soil in common was the oldest member of the kin, who was vested with absolute power over life and property of the family members. Economic activity and social development of the individual were only possible within the limits set by the patriarchal order; the affiliation with the kin was the very prerequisite for the individual's participation in economic and legal life (Anschhoff and Henningsen, 1986; Faust, 1977; Paulick 1956; von Gierke, 1954). Today in Germany co-operatives have changed to the Raiffeisen type being true democratic, voluntary associations. Even though nowadays in Germany co-operatives are active in many sectors still the agri-food sector is one of the most important ones (Raiffeisen, 2004; Hanf and Kühl, 2008). For example, out of the five biggest dairy companies three are co-operatives (Statistisches Jahrbuch, 2004). However, in the last years the agri-food sector has been prone to severe changes (Balmann et al, 2006; Boehlje, 1999; Hanf, 2000; Hanf and Drescher, 1994). Besides changes of the Common Agricultural Policy, changes resulted also from alterations in consumer demand as well as changes induced by retailers and processors to gain inter-firm efficiency gains. However, among these other factors, Bovine Spongiform Encephalopathy (BSE) and Foot and Mouth Disease (FMD) which hit Germany in winter 2000/01 had a severe influence on the structure of the sector. Jointly consumers and politicians demanded more transparency of the whole production process in order to ensure the reliable transfer of quality attributes (such as the production method etc) from the farm suppliers up to the final consumers. As a result, this development catalysed the formation of vertical coordinated systems (Hanf and Hanf, 2007). The results of a Pan-European survey show such chain systems could be either hybrids or fully integrated firms. However, the results clearly show that the majority of such chain systems are vertical co-operations (Kagerhuber and Kühl, 2002). Such vertical systems have in common that they are strictly coordinated by a leading firm that is in general a well-branded processor or in the case of retail brands a retailer. On the one hand, these 'chain captains' have to be customer/consumer oriented in order to stay in the market but at the same time they have to use many resources in order to manage the whole supply chain. In this context the questions "what role can co-operatives play in such vertical coordinated chain systems" and "how can they deal with the related managerial challenges" arise. In order to answer these questions the paper is structured as follows. The following chapter will introduce vertical coordination and elaborate on the hybrid form 'network'. Particular emphasis is laid on supply chain networks and their management. Afterwards a brief introduction of the German Raiffeisen co-operatives will follow in which the characteristics of these co-operatives will be elaborated. In the fourth chapter this paper will discuss whether co-operatives are capable of dealing with the challenges induced by vertical coordination and how their management has to respond to these challenges. The paper ends with a short summary.

Journal of Co-operative Studies, 42.2, August 2009: 5-13 ISSN 0961 5784©

Vertical Coordination as a Result of the Changes

Vertical Coordination in the Agri-Food Business

As in most developed countries in Germany the vast majority of food products are sold through retail chains. Hence, one can say that to some extent retailers dominate the agri-food sector. Here, a major determinant has been the concentration process at the retail level. For example, the top five German retailers have a cumulative market share of about sixty percent and the top ten retailers have an aggregated market share of about eighty-five per cent (o V, 2008). This concentration indicates that retailers face fierce competition which demands that retailers forage for all efficiency gains possible. Arguably, producing at an efficient level has always been a prerequisite for company success. However, while in the past enterprises were seeking efficiency and quality improvements solely in their own firms, nowadays companies recognise that intra-firm efficiency gains are no longer sufficient and are moving to address inter-firm issues as well. Particularly in the agri-food sector, efforts to improve the efficiency throughout the whole value chain can be regarded as a competitive necessity. The majority of the medium-sized and large firms in the food industry are using supply chain management in order to gain efficiency by, for example, reducing stocks, optimising logistics, and reducing waste. The persistent competitive importance of consumer orientation has provoked the previously logistic-oriented concept of supply chain management to have added the concepts of 'efficient consumer response' and 'collaborative planning, forecasting and replenishment' addressing the demand side (Lindgreen and Hingley, 2003; Mau, 2000; Xu and Beamon, 2006).

Another important change in the agri-food business is the changing perception of quality. However, even though people have long been concerned about the quality of their food during times of food scandals, people are becoming even more routinely aware of, and concerned about, food quality. In Germany, the Bovine Spongiform Encephalopathy (BSE) and Foot and Mouth Disease (FMD) crisis of winter 2000/01 can be regarded as the straw that broke the camel's back. Consumers perceived this crisis as perhaps the doomsday of modern food processing. Consumers, politicians and the press unanimously clamoured for transparency of the whole production process resulting in a change in the perception and the expectations of food quality by consumers and politicians affecting the consumption patterns of 'good' food. The most striking consequence of these dramatic food scares was the fact that politicians, consumers and also producers and suppliers assessed that food quality is no longer the responsibility of a single firm. Instead, the whole food chain needs to work together to deliver the 'new quality' (Hanf and Hanf, 2007).

The suggested developments point to a need for increased verticalisation in the agri-food sector. Vertical coordinated systems involve the exchange of goods not primarily conducted by market transactions. Thus, verticalisation implies these chain organisations are either hybrids or vertically-integrated companies. However, as food products are usually not produced in strict (vertically-integrated) food chains they are, instead, produced in vertically-coordinated networks (Brito and Roseira, 2005; Gulati et al 2005; Hanf and Kühl, 2005, Kagerhuber and Kühl, 2002; Lazzarini et al, 2001; Menard, 2004; Menard and Klein, 2004).

Summing up, in order to sell notable amounts of food products firms have to sell through retailers. Hence, requirements regarding efficiency and quality set by them have to be regarded as necessities to stay in the market. Thus, verticalisation and its consequences such as the building of vertical networks can be viewed as essential.

Networks

Networks address all questions on inter-organisational relationships of more than two firms (Claro et al, 2004, Lazzarini et al, 2001, Zylbersztajn, 2004). Generally they can be defined as "specific properties of the transaction relationships, typified by relational relationships in which formal and informal sharing and trust building mechanisms are crucial" (Zylbersztajn and Farina, 2003). An approach to classify networks in four groups is taken by Burr (1999). The four groups are referred to as spontaneous, self-organising, project-orientated and strategic networks. The spontaneous network is described as being polycentric and the intensity of the relationship is rather low. The network companies are equal, ie none of the companies is able to coordinate the other network companies. Therefore, such a network has no broker. The project-orientated network can also be described as being of short term nature and having a low intensity of relationship. Even though networks are polycentric by nature this type of a network has some hierarchical coordination mechanisms installed. Thus, there is a central company acting as a broker. The self-organising network is characterised as being set for a long term and the intensity of the relationship is rather high. Without having a focal company (broker) there is no hierarchical coordination. Strategic networks have a broker coordinating the participating of firms in a hierarchical style. The intensity of the relationship within the network is rather high and the network is set for a long term, too. In such a hierarchical-pyramidal network with a broker, a strategy leading focal company builds the core element of the network being either manufacturer or retailer. Because of the long lasting explicit or implicit contracts the other network actors are heavily depending on the focal company. The level of dependency is higher for vertical than for horizontal ties (Wildemann, 1997). Even though it seems as if the dependency is rather unilateral applying the Resource Dependency Theory a mutual dependency is becoming evident. The influence of an institution matters to the resource dependency relationships it has with other institutions (Pfeffer and Salancik, 1978). If the focal organisation itself is dependent on critical inputs of other organisations, these organisations will have some power over the focal company (Medcof, 2001).

Summing up, networks are any given kind of co-operation with more than two actors involved. Hence different forms exist – ranging from short term, non-hierarchical up to long term, hierarchical ones.

As shown, the vertical linkages are relevant in order to guarantee the food quality the consumer. Thus, I will refer to strategic networks in the following chapters. In the context of the agri-food business the term 'supply chain networks' (SCN) or netchains is often used (Lazzarini et al, 2001, Neves, 2003, Zylbersztajn and Farina, 2003). Studying vertical procurement relationships in the agri-food business, one has to take into account that such relationships are formed by heterogeneous firms (eg retailers, processors and farmers) but also that the relationships are formed to pursue a clear aim. Hence, they can be characterised as a strategic network disposing over a pyramidal-hierarchical structure (Jarillo, 1988; Wildemann, 1997; Gulati et al, 2000). This means that, on one hand, a focal company (chain captain) is present (Mentzer et al 2001; Hanf and Dautzenberg 2006), and on the other hand, there are firm, dyadic, and network levels (Duysters et al, 2004). For the German agri-food business the focal company has to take into account that the majority of network members are SME. Quite often such companies do not have a sophisticated IT-infrastructure, high man-power, and sufficient quantity of commodities. Especially for agricultural goods the total amount of supply needed has to be delivered by various farmers. Thus, the focal company has to manage such horizontal co-operations itself or it has to coordinate through system suppliers.

Summing up, to secure process quality and efficiency supply chain networks - a specific kind of network – have to be formed in the (German) agri-food business. Such strategic networks are pyramidal-hierarchically structured over a 'chain captain' that has to manage the entire food chain.

Management of supply chain networks

Vertical (procurement) relationships involve exchange between adjacent stages of the value chain. Thus, many organisations have to act together, with each organisation dependent on the performance and actions of the others (Brito and Roseira, 2005, Lazzarini et al, 2001). Thus, the crucial question is how to organise the participating firms along the supply chain. Here different problems can occur. The first set of problems stems from conflicts of interests among the different actors. The canonical problem is the famous prisoner's dilemma (Gulati et al, 2005). Such problems can be solved by aligning the interests of the different actors through formal and informal mechanisms (Gulati and Singh, 1998; Granovetter, 1985; Kogut and Zander, 1996; Williamson, 1975; Zaheer and Bell, 2005).

The second set of problems addresses alignment of the actions of the different actors (Levy and Grewal, 2000). Coordination problems arise if actors are unaware that their actions are interdependent and if there is uncertainty that makes the others' actions unpredictable (Gulati et al, 2005). Thus, either partners fail to share accurate knowledge about the decision rules that others are likely to use or they fail to understand how one's own actions are interdependent with those of the others (Gulati et al, 2005:419). Programming, hierarchy, and feedback, as well as culture, commitment, and a collective strategy are mechanisms for overcoming coordination problems (Malone and Crowston, 1994; Kogut and Zander, 1996). Simatupang et al (2002) name logistics synchronisation, information sharing, incentive alignment, and collective learning as general coordination modes. Related topics include revenue sharing (Cachon and Lariviere, 2005), decision support systems (Xiao et al, 2005), and the use of modern IT infrastructures (Müller, 2001).

Summing up, chain management consists of both the alignment of interests and actions of the various involved firms, and both tasks have to be addressed simultaneously. Hence, it is a complex, time and resource demanding task that has to be done by the 'chain captain'.

Challenges for co-operatives in a vertical coordinated agri-food business

Co-operatives in Germany

Even though the beginnings of the co-operative grouping on German soil can be traced back to the German tribes (von Gierke, 1954), the Raiffeisen co-operatives which are addressed in this paper 'only' date back to the year 1869 (Anschhoff and Henningsen, 1986). Today, Raiffeisen co-operatives still play a key role in the German agri-food sector because of or despite their long history (Raiffeisen, 2004). Having shown that the agri-food sector in Germany is changing rapidly towards a higher degree of vertical coordination, questions arise about whether co-operatives are capable of dealing with these upcoming challenges and how they have to adapt their management. In order to answer these questions firstly the current co-operative system in Germany will be described. Afterwards the role of German Raiffeisen co-operatives will be discussed using the facts worked out in the previous chapter.

The German Raiffeisen co-operative system can be described as rich in tradition and highly developed. It is a multi-tier system of the co-operatives in Germany. The first tier is the local trading and service co-operatives, eg purchasing and marking co-operatives. These local co-operatives provide the basis of regional co-operative business centres representing the second tier. The national co-operative centres are the third part of the system (Anschhoff and Henningsen, 1986). The principles of Raiffeisen co-operatives can be delineated by the identity of users and owners, the democratic principle of voting and the non-existing of barriers of entry. Additionally, the legally manifested business aim to nurture their members can be seen as a further characteristic of Raiffeisen co-operatives (Anschhoff and Henningsen 1986, Laurinkari and Brazda, 1990). Traditionally, the aim to establish countervailing power has been regarded as the most important duty of a co-operative (van Dijk, 1997). Other business aims like correcting market failure, guaranteeing markets and enhancing margins can be seen as levers to operationalise the main business aim. These business aims are corresponding to the ones of the Sapiro I and II co-operatives and the Nourse I and II co-operatives in the USA (Cook, 1997).

Summing up, in traditional German co-operatives 'one member (regardless of his economic importance) has one vote'. The business aim of them is to nurture their members (businesses). Furthermore they are open associations where the members are the principals hiring a (professional) management.

After presenting some general facts on Raiffeisen co-operatives in table 1 the development of the Raiffeisen co-operatives in Germany is shown.

While the total number of co-operatives and the total number of members has been steadily decreasing a significant increase in the total turnover can be observed. As table 1 indicates the majority of the co-operatives have remained essentially small and medium-sized organisations. However, as the decrease of total numbers indicates there is a tendency to increase the size by merging. Furthermore, in various branches of the German agri-food business many leading players are co-operatives. For example, in the dairy sector out of the five largest dairy processor companies three are co-operatives (LZ, 2009). In the meat sector the second and third largest slaughterhouses are co-operatives or of co-operative origin (LZ, 2009a). In the wine business over a third of the whole production is produced by wine co-operatives. In this sector, they are of particular importance since the co-operatives are more or less the only ones that are able to cater to retailers.

In sum, one can say that co-operatives are still of high importance in the German agri-food business occupying key positions in many sectors.

	1950	1970	1990	2001	2002	2003
Total No of Raiffeisen co-operatives	**23,753**	**13,764**	**5,199**	**3,632**	**3,423**	**3,286**
Credit with commodity business	11,216	4,920	1,474	354	301	274
Supply and marketing	2,710	1,740	645	473	458	430
Dairies	5,726	3,705	846	378	354	347
of which processing enterprises	2,569	823	255	87	83	78
Livestock and meat	329	263	205	112	117	106
Wine-growers	508	500	310	256	238	236
Fruit, vegetable, gardening	205	201	114	125	121	117
Centres	83	90	53	32	29	27
Agricultural co-operatives				795	769	751
Other Raiffeisen co-operatives	2,976	2,345	1,552	1,107	1,036	998
Total proceeds turnover (Million Euro)	**3,463**	**17,461**	**39,030**	**39,431**	**37,596***	**37,500***
Total No membership (in thousands)	**3,278**	**3,870**	**4,487**	**2,653**	**2,495***	**2,385***

Table 1: Development of Raiffeisen co-operatives 1950-2003 (Raiffeisen 2004)
***Preliminary figures**

Co-operatives in supply chain networks

As shown the agri-food business is changing rapidly. One result is that vertical coordination in the form of non-market exchange relationships is increasing in importance. In this context, Fulton (1995) concludes if markets disappear as a result of an increased vertical coordination co-operatives may also begin to disappear. Hendrikse and Bijman (2002) share this assessment for the case that the investment on side of the processor or retailer becomes more important for the total chain value than the investments by the farmers. Hence, despite their contemporary relevance, co-operatives have to establish mechanisms to comply with the demands of these customers ie in order to supply them, co-operatives face increasing demands on process quality and quantity. However, using a principal-agent approach and the concepts of opportunistic behaviour, conflicts of interest, asymmetric information and stochastic conditions Eilers and Hanf (1999) show that it is not clear who is the principal and who is the agent, ie both the co-operatives and the members can be principals and agents. For this reason, neither leadership mechanisms nor selective terms of delivery can be enforced by the co-operatives, ie the members can deliver all the commodities which alternative dealers do not accept. Co-operatives being forced to accept these commodities face the problem of adverse selection. As a result new governance structures are being formed in which the management of the co-operatives gets more authority for decisions (Bijman and van Dijk, 2009). The supply side marketing co-operatives (eg dairy co-operatives and slaughterhouses) have some advantage compared to investor owned firms because of their property rights structure (Sykuta and Cook, 2001). A reason is that at the producer level the most practical coordination mechanism is contracting. Schulze et al (2007) and Schulze et al (2006) found that farmers rather have a little more trust in their own 'firm' than in an investor owned firm. However, Karantininis and Zago (2001) showed by applying a game theory model that instead of selling their commodities to (open membership) co-operative farmers would rather sell them to investor owned firms if they had the choice. Furthermore, by using a property right approach Cook (1995) pointed out five general sets of problems: Free Riding Problems, Horizon Problems, Portfolio Problems, Control Problems and Influence Cost Problems. Additionally, Fulton and Giannakas (2001) show that the cross-subsidisation and member heterogeneity in large centralised, multipurpose co-operatives leads to substantial financial pressures, because members of such co-operatives do not see a strong connection between the success of the co-operative and their own business.

Concluding, in order to survive in vertical coordinated markets Raiffeisen co-operatives have to strengthen their contracting policy. On the one hand they have to continuously enhance their relationships to their members and on the other hand they have to work out a quality policy that overcomes the aforementioned problems.

A way to overcome these problems is to form groups of members that share the same business aims. For wine co-operatives Hanf and Schweickert (2007) have shown that by grouping their members into homogeneous clusters some co-operatives were able to successfully master the quality and quantity demands of the German retailers. Another example is the third largest German slaughterhouse 'Westfleisch' which created on the one hand two closed chain systems 'BestSchwein' and 'TranspaRind' as a response of the meat scarce in winter 2000/01 (Beuck, 2002). On the other hand it abides by an open membership for the rest of its production in order to operate at full capacity.

Thus, if the traditional co-operatives get the quality issues under control they will play an important role in vertical coordinated supply chains. However, in general their role will be the one of a major supplier but not as 'chain captain'.

However, discussing vertical coordination and supply chain networks does not mean to concentrate solely on the question of whether a co-operative might act as a supplier and what to do to ensure this role. It also means discussing whether a co-operative might act as a chain captain managing the whole network. The before mentioned general agency problems (Cook, 1995), quality problems (Eilers and Hanf, 1999), and the problems caused by heterogeneous business interests of the members (Fulton and Giannakas, 2001) show that in general co-operatives already have a hard time to overcome these restraints in order just to stay in supply chain networks. However, in some cases co-operatives are capable of acting as a 'chain captain'.

In order to answer the question whether a co-operative is able to be a 'chain captain' one has to recall the characteristics of supply chain networks. They are hierarchical-pyramidal networks possessing a centralised decision making authority, coordinating the whole network, and being purely customer oriented. Hence, a major problem is to explain to their members why the traditional member orientation has to be altered or at least complemented with a customer orientation. Hanf et al (2009) showed that German wine co-operatives used market power and the bad reputation of retailers to convince their members that the co-operative had to be more customer orientated in order not to be delisted. The coordination task of the whole network is very resource demanding.

Since all co-operatives face the situation of a given budget this means that they have less budget/resources for other (member related) activities. However, key to be able to take over the function as a 'chain captain' is the centralised authority[1]. Having gained this authority they are able to select their members and if necessary a member is dispersed. Thus, these co-operatives have a closed membership. Furthermore, the co-operative has the right to define quality norms for their supply (Hanf and Schweickert 2007). Whereas, in Germany such thoughts are fairly newly introduced, the concept of 'new generation co-operative' has been discussed for quite some time in the US.

The 'new generation co-operative' can be understand as Sapiro III organisations in which asset appreciation mechanism, base equity plans as well as increased share liquidity by delivery rights clearing houses have been developed (Cook 1995). The major advantage can be seen in the improvement of members` incentives to contribute to the risk capital of the co-operative (Chaddad and Cook, 2004). Drescher and Ratjen (1999) demonstrated that these thoughts are applicable in Germany but also showed the difficulties in implementing such concepts in practice.

In sum, one can say that some co-operatives are capable of taking over the role and responsibilities of a 'chain captain'. However, it is necessary that they gain some power over their members. Hence, this is rather the exception than the rule.

Summary

The Raiffeisen co-operatives have been a major force in the agri-food business for more than a hundred years. However, the German agri-food business is changing significantly. Two of the major reasons for this development is the motivation to achieve inter-firm efficiency gains and to fulfil the demand of a higher process quality that comprises all stages of the value chain from the ‘stable to the table’. As a result the traditional spot market transactions are substituted by exchanges within vertical coordinated chain systems that are most often hybrid formations. Such hybrids can be described as strategic networks disposing over a centralised decision making authority that has to manage the whole network. This paper analysed the question of which role German co-operatives can take in such supply chain networks and which managerial challenges have to be mastered.

Just to stay in such vertical coordinated chain systems, co-operatives have to overcome some obstacles. Due to different reasons such as general agency problems or heterogeneous members co-operatives face some quality problems. An example from the German wine sector showed that the strategic grouping of their members and hence forming homogeneous member groups can be a way to deal with such problems. If a co-operative wants to become a ‘chain captain’ such efforts are not enough. In this case they must gain a centralised decision authority. Such efforts often result in the change from an open to a closed co-operative. Because in most cases the members are not delighted to lose power over their own firm such events are rather the exception than the rule.

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Notes

1 This does not mean a return to the kinship of the German tribes, but it clearly means that the co-operative – as a firm – has to gain some power over their members in order to lower the double principal–agent problematic.