

How to manage free riders in a network of competitors: the case of animal genetic selection industry in France

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Abstract

Setting up a network is considered as a key factor for the success of a small and medium enterprise (SME) to innovate and to create value through innovation. Moreover, there are difficulties in setting up such a network in the case of competing companies. Such 'coopetition' is based on knowledge transfer and resource sharing. But this kind of partnership may be used in an opportunistic way by some partners. The objective of this paper is to focus on these difficulties in managing a network of competing SMEs in order to manage an innovation whilst avoiding opportunistic strategies, using the analysis of the animal genetic selection industry in France.

Keywords: innovation, coopetition, cooperative

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1. Introduction

Technical innovation is one of the main sources of value for companies (Audretsch *et al.*, 2002; Link and Scott, 2001). Small and medium enterprises (SMEs) are considered more reactive than big companies to exploit these innovations. This is due to their small size and the simplicity of their line management (Bhattacharya and Bloch, 2004; Link and Rees, 1990). Nevertheless, innovation and its integration into the production process can be difficult to manage for an SME. This is because a wide range of knowledge and resources is needed to manage and incorporate innovation (Dhanaraj and Parkhe, 2006). Creating networks or cooperation are a successful alternative for SMEs to manage innovation. This cooperation can be formalized through joint ventures aimed at sharing R&D efforts (Belderbos *et al.*, 2004; Fukugawa, 2006). It is thus possible for these companies to share their own resources or to access a common resource. Such cooperation between SMEs is regarded as the main success factor of innovative SMEs (Zeng *et al.*, 2010). It mainly happens with companies involved in the same industrial sector or those with a client/supplier relationship (Miotti and Sachwald, 2003). Such associations between competitive SMEs are very rare as innovation is a factor in differentiation. Nevertheless they have been observed in the Japanese automobile supply chain. In this case they are due

to the incentive to collaborate from automobile companies to their suppliers (Sako, 1996).

It is possible to identify two factors in the success of such industrial networks (Veflen Olsen *et al.*, 2012):

- The importance of a central coordination structure (Hanna and Walsh, 2002) which should be a neutral third party.
- The importance of trust between members that they all are willing to share knowledge (Fuller-Love and Thomas, 2004).

With these two conditions it is possible to set up democratic governance allowing transparency and legitimacy in the management decisions (Cotta, 2001). Nevertheless, this democratic governance can have several disadvantages due to the similarity of the network members (Assens, 2013). This can lead to inertia in the collective's decisions (Miles and Snow, 1992). Conflict may also arise between members who are heavily involved in the network and some free riders who try to take advantage of it without sharing their resources. The risk of such a strategy is greater when there are important changes in companies' environment.

In this paper we aim to focus on such free riders' attitude in the sector of genetic selection in animal production. One

of the characteristics of the French agricultural sector is the importance of cooperative companies. At the moment these companies are trying to cooperate for innovation and to achieve a critical size in a specific market (Lewi and Perri, 2009; Thomas, 2008). This cooperation is formalized through the creation of cooperative unions, which are cooperatives of cooperatives. In this case the members of a union cooperate for several actions but can still compete in other domains.

2. Theoretical aspects of coopetition

Coopetition is a paradoxical strategy of cooperation between competitors. Because of this cooperation each competitor can increase its profits (Ritala, 2012). This cooperation between competitors allows to strengthen the performance the innovation capacity of each company, specifically in open innovation (Chesbrough, 2007). This strategy can take the shape of research and development consortium, the creation of common subsidiaries, suppliers networks, sharing of supply chain,... (Luo, 2007). Nevertheless, coopetition doesn't aim to eradicate competition, but on the contrary to locally standardize competition behaviours in the industry sector (Hunt, 1972). This strategy can be considered as a mutual agreement in order to concentrate the all sector on a reaction against a threatening regulation or a technological risk (Dagnino *et al.*, 2007). Coopetition

is so based on the sharing of resources between competitors. There is so a risk that the benefit of this strategy will be one-sided used when the competition take place again. The main problem is so in deviant behaviours when the cooperation hides specific interest. Such strategy can so lead to conflict of interest if it is not possible to balance between competition and cooperation (Bengtsson and Kock, 1999). This balance can be broken up by opportunistic behaviours of competitors (Das and Rahman, 2010). It is possible to manage such behaviours taking into account the type of coopetition. These types depend form the timing of the process (sequential or simultaneous) and of the fact that the process is internal or external of one company (Table 1). Theses dysfunction risks and the way to manage them were shown for three of the four coopetition forms. In the case of simultaneous competition and cooperation, which is external of the firm, there is few management tools proposed in the literature. The case that we present in this paper allows to explore this kind of coopetition.

3. The research methodology

This research on deviant behaviour in coopetition is based on a case study on a network of cooperatives companies. This is the good scale to study coopetition as underline by Hunt (1972):

Table 1. Type of coopetition.

	Internal coopetition inside the company	External coopetition: between competing companies
Sequential cooperation and competition process	<p>Deviant behaviour risk surrounded by the legal and financial boundary of the company:</p> <ul style="list-style-type: none"> • multipoint competition; • separate cooperation and competition steps depending of the creation value process. <p>Separate teams in charge of cooperation and competition to avoid conflict of interest (Bengtsson and Kock, 1999)</p>	<p>Risk of deviant behaviour, bounded by market norms and regulation or by a neutral intermediary (Wilhelm, 2011)</p>
Simultaneous cooperation and competition process	<p>Risk of deviant behaviour bounded by three principles:</p> <ul style="list-style-type: none"> • distinguish the resources coming from the cooperation with the ones owned by the company; • cooperating on support activity of the value chain and competing on operational activity; • work on complementarity to avoid substitution at the end of coopetition (Bengtsson and Kock, 1999; Luo, 2005). 	<p>Risk of deviant behaviour can't be bounded by law as the competitor are independent. Market regulation are insufficient to manage coopetition (Bengtsson and Kock, 1999; Lado <i>et al.</i>, 1997; Luo, 2007).</p>

... analyses competitive rivalry at an intermediate level, between the industry level and the firm level, making it possible to grasp differences that exist within an industry. It is at this intermediate level that networks and relationships between competitors can be observed and analysed.

This network is formalized through a specific cooperative, the UNCEIA, which is the national union of animal selection companies. In 2010 the UNCEIA employed 43 staff: it is a federation of 36 companies carrying out animal artificial insemination and 11 animal genetic selection companies (9 for cattle, 1 for goats and 1 for sheep). The goal of this federation is to support the interests of the animal insemination sector, to innovate and invest in order to improve the selection programs and to give advice to the members of the federation. To do so, a 2 million euro budget is devoted to R&D. This research was funded by UNCEIA while we organized the general assembly of the network in 2011 on cooptation. This case study is based on interviews with several employees of UNCEIA. We then cross checked (Jick, 1979) the information with interviews with agricultural journalists and with suppliers. We also used other data, such as reports on activity, financial data, and articles from the professional newspapers. The case was then submitted to the UNCEIA CEO as suggested by the 'feed-back Survey' principle (Crozier, 1963) which recommends validating the case with the actors involved. It is thus exploratory research to highlight the competitive advantages of the cooperative union and how they should regard the 'free rider' behaviour of several members of the union. The people we interviewed are shown on Table 2.

4. Cooptation in the case of UNCEIA

The UNCEIA: a cooperative of cooperatives

UNCEIA is a union of agricultural cooperatives which federates genetic selection companies and artificial insemination companies in the animal genetic selection sector and specifically for cattle, goats, sheep and pigs. As a network company, its budget comes mainly from the subscriptions of its members. In return the UNCEIA provides technical and legal advice, offers lobbying services to the animal genetic sector and shares the financial and technological R&D resources in order to improve livestock breeding.

'Pure and perfect' cooperation: a boom in open innovation

Artificial insemination of livestock dates from the 40s. Its aim is to increase animal production by genetic selection. This selection is based on the analysis of descendant performance, which takes 7 years. The use of this technology has been encouraged by French government policy since the Second World War in order to increase animal production and to ensure animal race traceability for public health reasons (Labatut, 2009). During this period (from the 40s to 2000) the development of artificial insemination was based on a shared learning process (Hatchuel, 1994) between the technicians of the insemination centres, livestock cooperatives and the suppliers linked to the animal sectors such as POLYCEM or IMV. Each French department had its own insemination centre.

Table 2. People interviewed (semi structured interviews, 2 hours average duration).

Job of interviewee	Company
chairman	UNCEIA network
general manager	UNCEIA network
deputy director in charge of communication	UNCEIA network
general manager	company member of the network
general manager	company member of the network
deputy director	
agricultural journalists	insemination newspaper 'Bulletin technique de l'insémination animale', agrapresse hebdo
agricultural journalists	agricultural newspaper pleinchamps
agricultural journalists	agricultural newspaper typex

The insemination technique develops as an open innovation (Loilier and Tellier, 1999): a collaborative process with sharing of the property rights between the actors of the sector (Chesbourg, 2003; Le Masson *et al.*, 2006). There are several reasons for this development:

- The insemination centers consider that the technological innovation of selection is very far from their main activity.
- The absence of commercial risk in the open innovation favours collaboration (OECD, 2008).

Moreover the legal context favours such innovation. Scientists from the different insemination centres collaborate, comparing the different outcomes. Such collaboration between peers is easy as the insemination centres have a monopoly within their territorial zones. This monopoly is granted by the government because of the public service rendered by the insemination centres. Thus, the livestock law published in 1966 allows every farmer to access artificial insemination under the same conditions anywhere in the French territory. The cooperatives have to provide high quality insemination material to any farmer in exchange for the monopoly in their territorial subdivision. During this period the French agricultural ministry tasked the UNCEIA to federate the insemination cooperatives. The selection techniques used between 1960 and 1995 were based on the 7 year period of observation, with performance monitoring of the animals. Improvement in the techniques has allowed the UNCEIA to work with public agronomic research organizations such as INRA and the livestock institute.

Competition within the cooperation: the end of the open innovation

At the end of the 90s two changes disturbed this harmony between the partners of the UNCEIA: technological change and a legal one.

The selection technology changed radically with the use of genomics. The qualities needed in a good breeding animal can be predicted in advance and the results are then refined using the statistical data collected from farmers. The success of the prediction are thus related to the number of the farmers who provide their data. The skills needed to increase competitiveness (statistical knowledge, molecular biology, etc.) change and are no longer owned by the insemination centres but by the UNCEIA. One of the main challenges is the building of a statistical database by the UNCEIA and INRA. This database includes 90,000 farmers and can be used to analyse the genetic traits of 4 million cows. In order to refine the predictions the UNCEIA started collaboration with companies from other European countries. The federal

role of UNCEIA thus reinforces this technology and the collaboration with public research (INRA, Institut de l'Élevage, CNIEL, INTERBEV).

At the same time some of the members of the UNCEIA are becoming free riders and try to leave the union, as explained by the UNCEIA CEO:

Our cooperatives union, UNCEIA has nowadays some difficulties linked to completion in the animal insemination sector. During the past period the UNCEIA invested in genomic research. The insemination centres get a lot of profit from these investments because of the simplification and the increase of efficiency due to genomic. But in order to allow this collective effort to go on it is necessary to preserve cooperation between cooperative companies even if the economic environment incites them to compete.

The changes in French legislation in 2006 explain the emergence of free riders. Before 2007, the cooperative companies were protected against competition in their territorial zone. But since 2007, with deregulation, any cooperative can operate in the territorial zone of another. Meanwhile the activity of the cooperatives decreased because of the milk and meat crisis. Insemination cooperatives were therefore tempted to stop the sharing of innovation within the UNCEIA as this innovation can provide a competitive advantage.

Due to these changes the cooperatives joined together in order to maintain their competitiveness by decreasing their costs. This concentration led to the emergence of 4 selection cooperatives instead of nearly 11. These cooperatives represent 71% of the subscriptions of the UNCEIA, giving them great power in the decision process. Taking their size into account these companies are tempted to insource the R&D in order to gain a competitive advantage against their competitors which are also members of the UNCEIA. At this point the free riders' strategies emerge and affect the activity of the UNCEIA. Some of the 4 think of developing their activity outside of their territorial zone, competing directly with other members of the UNCEIA. This would tend to increase the free-riding behaviour in the UNCEIA, with some cooperatives beginning to compete with the other members and using the technology developed by the UNCEIA. The first step of this strategy is to convince the insemination centre to change from one selection cooperative to another, which led to tension between selection cooperatives. Another one is to buy one of the common suppliers. This led to difficulties for the others

to access this supplier. Such deviant behaviour leads to a decrease of UNCEIA's R&D ability. This is an unsatisfactory situation as no one cooperative in the network has the critical size to manage the innovation process on its own.

The case analysis: the management of coopetition

The management difficulties of the UNCEIA are great: is it possible to control the deviant behaviour of some actors that cannot be ignored in the strategic decision without legal or capital power? How is it possible to preserve cooperation and solidarity between the members of the network when some of them are free-riders? To answer these questions it is necessary to look at the organization of the UNCEIA: a network company with a democratic governance and involved in an open innovation process. The UNCEIA is developing its technology using the principle of open innovation between peers (Chesbrough, 2007; Loillier and Tellier, 1999) which is similar to the development to open source software. But the sustainable management of such good is not so easy as it is not possible to exclude somebody from the use, even free riders. It is thus necessary to make rules in order to avoid deviant behaviour among peers. Such regulation has to balance between too much authority and too much permissiveness:

- A use of too much authority could lead to a lack of innovation, which occurs when the members strongly involved in the innovation process try to reinforce their power of decision in the network. This could lead to decreasing interaction between the members which could lead to a loss of serendipity (Katz and Gartner, 1988) between the members of the network.
- Too much permissiveness could lead to a breaking up of the network because the members are no longer able to absorb the social rules in place. Therefore most of the members will have a peripheral position in the network. They will need to build relation with intermediary actors in order to have an influence in the network. The relation with the other members will then become less formal (Granovetter, 1985). The risk is therefore a widening social gap between the members that could lead to conflict between them.

Hence the innovation process is hard to manage when self-management is no longer able to provide the balance between social cohesion of the network and the ability of the network to adapt itself. Members' action to preserve this balance works against it as it tends to increase the inequilibrium while the network is increasing. Hence we find that small networks with keen members take the place of bigger ones that increase too fast (Fourcade and Torrès, 2003). It is possible to avoid these management

difficulties of such networks and innovation processes if a bigger company takes care of the process.

In the case of the UNCEIA the open innovation process involves competing companies. The management therefore has to take into account the coopetition regulation mechanism (Bengtsson and Kock, 1999):

- To split up cooperation and competition, taking into account the nature of the market: companies can cooperate in some markets and compete in others. This allows conflict to be avoided.
- To split up cooperation and competition taking account the stage of the creation of value process. It is therefore recommended to cooperate in the upstream stages and to compete when close to the consumer.
- To split up the two kinds of relationship (cooperation and competition) in the companies, with some people involved in the cooperation process while the others are involved in competition.

Hence it can be useful to separate cooperation and competition, taking into account the kind of strategic challenge (Bengtsson and Kock, 1999).

For the UNCEIA, the main point is to manage the cooperation in the network in order to develop and to preserve a competitive advantage in Europe while the members of the network are competing in France, as long as this competition does not affect the European advantage.

Regulation of free-rider behaviour in the coopetition

It is possible to use several regulations in order to avoid behaviour that compromises the coopetition (Hannachi and Coléno, 2012): peer regulation, a trusted third party, a contract and a mediation structure (Table 3). Deviant behaviour can be managed through tacit agreement and by peer reciprocity between the members of the UNCEIA. A normalization of the deviant behaviour can be ensured by collective pressure. If this solution fails or in case of conflict a third party could provide mediation. Moreover a good practice bill in the UNCEIA defines the right and duty of all the members. The definition of the rules to gain access to the common technology will avoid free riding. Other structures like a joint venture could be used as a mediation structure when reaching new markets or in the case of new cooperative projects. Finally, sharing of employees, technologies and capital could reinforce the relationship. Cross participation on the boards of the other members can reinforce cooperation (Lomi, 1999).

Table 3. Management of deviant behaviour in the coopetition.

Peer regulation	Tacit agreement and reciprocity rules between competitors
Trust referee	A neutral third party can solve conflicts between competitors
Bill of good practice	Rules on rights and duties of the members
Mediation structure	Joint venture and cross participation between competitors

5. Conclusion

This work on cooperatives illustrates the need for competing companies to increase the value of their complementarity. The success of a company is not only linked to its ability to develop on its own but also on its ability to collaborate with competitors in industrial, commercial and R&D domains. Nevertheless cooperation between competitors is not simple to manage as shown by the UNCEIA case. The desire to cooperate with competitors is not natural (Bengtsson and Kock, 1999). It depends on the place the company has in the market. If a company dominates the market it will try to take advantage of this position. On the other hand, if a company needs to access an external resource to gain a competitive advantage it will be tempted to adopt cooperative behaviour. So coopetition emerges when a company is dominating the market and is in need of external resources. Nevertheless, the dependence of the different companies involved in the coopetition could change in the course of time and so can the balance of power. For example, in the UNCEIA case, the expansion of a selection company changes the equilibrium between the members of the network. This increases the risk of free riding.

This work on the UNCEIA could be generalized to other cooperative network-companies such as banks or insurance cooperatives when there is a governance crisis.

To remedy such a crisis it is therefore necessary to introduce more consistency into the company statutes, trying to strike a balance between how much members receive and how much they share. The more a member is involved in the network-company, the more he should get from the network. Conversely, when a member decides to be inactive he should get less from the network and be free to compete with other members. This balance should give more consistency to the governance of the network, avoid free riding and increase the confidence of the members (Veflen Olsen *et al.*, 2012). So the longevity of a network-company is based on adaptable governance, going from informal cooperation at the beginning to a more formalized one later (Benson-Rea and Wilson, 2003). The aim of this

formalization is to set up distribution rules and to recognize the role of a third party coordinator.

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