

The efficient governance of clusters –

An analysis of different modes of cluster management

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Paper presented at the *EMNet 2009*-Conference
School of Economics and Business, University of Sarajevo, Bosnia and Herzegovina, September 3 – 5, 2009
(<http://emnet.univie.ac.at/>)

Abstract

A cluster manager assumes essential coordination and organization tasks in a cluster varying from information services and support in the application for funds, to the evaluation of cluster firms. This paper analyzes from an economic perspective where the cluster manager should be organizationally embedded in order to perform the tasks at best and, consequently, to optimize the performance of the whole cluster. Therefore, two ideal types of organizational structures can be identified: First, the cluster can be governed by managers that are simultaneously managers of member firms, and second, it is possible that it is governed externally by cluster managers engaged in independent institutions that are beyond economic competition. To evaluate the efficiency of the respective organizational modes of cluster management, the incurring agency costs are examined. As a result, this paper emphasizes the different incentive structures of both forms of governance proposing that each form is applicable to the cluster concept, depending on the respective specific conditions of the cluster.

Keywords: strategic network, modes of network management, organization, cluster, cluster management

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1. Introduction

A cluster is a network of interconnected but distinct companies and institutions in a particular field of industry, whose scope is limited to a geographical area.² By affiliating to a regional cluster, firms can enhance their competitiveness and capacity for innovation³ through benefiting from externalities, such as knowledge spillover, higher incentives for innovation as well as access to resources and technologies.⁴ These positive externalities are likely to help the companies to gain or sustain a competitive advantage in comparison to their competitors who are not part of the network.⁵ Hence, critical for the success of a cluster is how the externalities can be internalized by the cluster members. This internalization confronts the cluster with communication, coordination and control tasks that become more complex with an increasing number of integrated firms. One reaction to these challenges is to deploy a central cluster manager. He assumes essential coordination tasks varying from information services and support in the application for funds, to the evaluation of cluster firms.⁶ Nassimbeni (1998) argues that these service structures in regional network help to maintain the relationships between the member firms and binds them like glue.⁷

This paper models a cluster, or particularly the cluster manager, as an intermediary institution that helps to bring transaction partners together and facilitates key strategic decisions of the firms.⁸ The intermediary upgrades the economic image of a region, fosters a location's specificity and contributes to an increasing performance of local firms by structuring the cluster activities.⁹ If the intermediary is absent and co-opetition within the cluster is neither supported nor organized, this institutional void will have a negative impact on a firm's positioning, its innovation capabilities and thus its efforts to internationalize.¹⁰

Given the missions and expectations the cluster management board is confronted with, the question arises how this intermediary institution should be composed in order to perform the tasks at best and, consequently, to optimize the per-

² See Porter (2000), p. 16; Nassimbeni (1998), p. 543.

³ See Porter (1998a), p. 80.

⁴ See Porter (2000), p. 16; Gulati/Nohria/Zaheer (2000), p. 203; Maskell/Lorenzen (2004), p. 993.

⁵ See Bell (2005), p. 288.

⁶ See the surveys of the Gallup Organization (2006), pp. 44-48, and Bühner et al. (2008), pp. 49-55, in order to understand which kind of support managers demand from public authorities. In part, public authorities can delegate these support tasks to a professional cluster management.

⁷ See Nassimbeni (1998), p. 543.

⁸ Earlier research about the theory of intermediation is fundamental to this and the following argumentation. See for example Spulber (2003) and Benston/Smith (1976).

⁹ See Ricart et al. (2004), p. 178, 184-188, with Khanna/Palepu (2003).

¹⁰ See Ricart et al. (2004), p. 185.

formance of the whole cluster. Therefore, two different organization modes can be identified: First, the cluster can be governed by managers that are simultaneously managers of member firms, and second, it is possible that it is governed externally by cluster managers engaged in independent institutions that are beyond economic competition. However, for implementing an efficient governance structure its effects on transaction and agency costs must be examined. Therefore, this paper attempts to contribute to the actual cluster and network literature by analyzing the consequences of the form of governance on the sum of transaction and agency costs that exist within the relationships in the cluster. It aims at identifying criteria that signal which type of governance should be preferred in practice under which circumstances.

This article is structured as follows: In a first step, strategic networks and regional clusters are defined and their main differences are identified through a literature-based approach. In a second step, the article explains to what extent a cluster management is able to reduce transaction costs and to enhance the cluster's efficiency. In a third step, after having demonstrated why a cluster manager is necessary, I discuss – after analyzing the consequences of the organizational embedding of the cluster manager on the agency costs – under which circumstances a cluster should be governed by firm managers or by an independent third-party cluster manager. The implications and limitations of this discussion are presented in the concluding part of the article.

2. Strategic networks vs. regional clusters: a literature-based approach

Next to network content and network structure, research on networks focuses on the field of network governance. Networks are understood as a particular form of governance that allow inter-firm resource and knowledge exchange as well as cost reduction compared to market or hierarchical coordination.¹¹ According to Williamson (1975) markets and hierarchies figure as two alternative coordination mechanisms for economic transactions.¹² Depending on the efficiency of the respective transaction model, a firm decides whether to buy the product or service in question via the market or to make it in-house. If opportunistic behavior can be expected, transaction costs are high and hierarchical structures should be preferred. In contrast, firms should exchange via the market, if transaction costs are low because contracts are written and can be enforced.¹³ But Provan and Kenis (2007) and Nassimbeni (1998) argue that there exist also hybrid – or intermediary

¹¹ See Thorelli (1986), Powell (1987) and (1990), Larson (1992) and Gulati/Nohria/Zaheer (2000).

¹² See Williamson (1975), p. 3f., with Coase (1937).

¹³ See Gulati/Nohria/Zaheer (2000), p. 209.

– forms of organizations, such as networks, which combine governance items of markets and hierarchies¹⁴ and are embedded in a continuum where the two addressed coordination mechanisms figure as poles.¹⁵ Even if networks are considered a distinct form of governance, the mechanisms used to manage the network as a whole still remain unclear. Provan and Kenis (2007) propose a typology of three governance types: (1) shared governance, (2) lead-organization or hub-firm governance and (3) governance by a network administration organization. While participants of the network are actively involved in shared and hub-firm governance, governance by a network administration organization is carried out by an external, separate and independent entity that is specifically created to manage the network. Furthermore, they suggest that the success of the adoption of a particular form of governance relies on factors like trust, size, and goal consensus.¹⁶ Nevertheless, they lack conclusions on the economic efficiency of network management in dependence of the governance choice plus some empirical evidence on their propositions. This typology helps to classify two similar, but distinct types of networks – the strategic network and the regional cluster – that are characterized in the following having recourse on the main literature streams.

Jarillo (1988) defines strategic networks as “long-term, purposeful arrangements among distinct but related for-profit organizations that allow those firms in them to gain or sustain competitive advantage vis-à-vis their competitors outside the network. (...) Essential to this concept of strategic networks is that of ‘hub firm’, which is the firm that, in fact, sets up the network, and takes a pro-active attitude in the care of it.”¹⁷

Taking up this definition, Sydow (1992, 2006) emphasizes that a strategic network is managed by one or more focal firms that define the relevant market and predict the network strategy as well as the preferred technology.¹⁸ The managing firm decides which firms are allowed to join the network and establishes formal and stable relationships with them that focus more on cooperation than on competition.¹⁹ Following Dhanaraj and Parkhe (2006), these hub-firms take a central position in the network; they are prominent and powerful and lead the network through assembling the resources and capabilities of its members.²⁰ According to these views, strategic networks can be ranged in participant-governed networks, be it managed by a hub-firm or a board of different firms’ representatives. The in-

¹⁴ See Provan/Kenis (2007), p. 232f.

¹⁵ See Nassimbeni (1998), p. 538.

¹⁶ See Provan/Kenis (2007), p. 234-236, with Provan/Fish/Sydow (2007), p. 504.

¹⁷ Jarillo (1988), p. 32.

¹⁸ See Sydow (1992), p. 82 and Sydow (2006), pp. 395-397 and Sydow/Windeler (1998), p. 267.

¹⁹ See Sydow (1992), p. 82 and Sydow (2006), p. 396.

²⁰ See Dhanaraj/Parkhe (2006), p. 659.

centives for cooperating in strategic networks are to benefit from selectively low coordinating costs and generate as a result sustainable competitive advantages.²¹

In opposition to strategic networks, regional clusters are characterized by the geographical proximity of its members.²² In keeping with Porter (2000), members or actors of regional clusters are not only firms positioned in an industry's value chain, but also companies of related and supporting industries, universities or other research organizations and public institutions.²³ However, the cluster actors do not only cooperate like in a strategic network, but they also compete with each other, which aims at enhancing their competitiveness and capacity for innovation.²⁴ The productive and innovative environment in the cluster fosters entrepreneurial activities, start-ups and spin-offs. Lechner, Dowling and Welpé (2006) show that this co-competition positively influences an entrepreneurial firm's development and its sales.²⁵ Taking these aspects into consideration, Maskell and Lorenzen (2004) argue that a cluster contains within itself more market elements than strategic networks and grants more flexibility to its members.²⁶ Thus, relationships can be changing and short-term, and firms can enter and leave the network more flexibly.²⁷

Regarding the issue of a cluster's management, there is no theoretical framework within the rich literature on the cluster concept that deals with the optimal governance of clusters. Motivated by Motoyama (2008) who elucidates that, due to a dialogue with the network theory, cluster theory could amplify its application,²⁸ we weigh up if the recommendations concerning network management identified in strategic network literature can be transferred to clusters.²⁹ As noted before, Jarillo (1988) and Sydow (1992, 2006) suggest that a so-called "hub firm" should take over the management of the strategic network.³⁰ But this proposition seems to be not adopted by cluster concepts and there exist not only such participant-governed but predominantly externally governed clusters.³¹ It appears to be more plausible to apply the already mentioned distinction of internally and externally governed networks, proposed by Provan and Kenis (2007), to the field of

²¹ See Jarillo (1988), p. 38.

²² See Sydow (2006), p. 397.

²³ See Porter (2000), p. 16.

²⁴ See Porter (1998b), p. 197f.

²⁵ See Lechner/Dowling/Welpé (2006), p. 523, 534.

²⁶ See Maskell/Lorenzen (2004), p. 992f.

²⁷ See Siebert (2006), p. 12.

²⁸ See Motoyama (2008), p. 353.

²⁹ Provan/Fish/Sydow (2007) provide a detailed review of theoretical and empirical literature on networks.

³⁰ See Jarillo (1988), p. 32; Sydow (1992), p. 82, (2006), p. 395.

³¹ For example the 21 Bavarian clusters which are part of the state-wide top-down Cluster Initiative that has been implemented in 2006 and covers 19 key industries. For further information please see the first evaluation report of the Bavarian Cluster Initiative from Bühner et al. (2008).

clusters. The respective type of governance frequently is determined by the process of evolution of the cluster. Therefore, we distinguish referring to Fromhold-Eisebith and Eisebith (2005) bottom-up clusters emerged through the alliance of actors and publicly initiated top-down clusters.³² While bottom-up clusters commonly are governed by private firms, top-down clusters are managed by a third-party institution whose actors are not directly involved in the member firms.

Table 1 summarizes the discussed characteristics of strategic networks and regional clusters.

Table 1: Characterization of strategic networks and regional clusters (Source: own version)

	Strategic networks	Regional Clusters	
		Bottom-Up-Cluster	Top-Down-Cluster
Geographical extension	Geographically distributed	Geographically concentrated	
Evolution	Formal, intentional	Emergent	Publicly initiated
Governance structure	Participant-governed network	Participant-governed cluster	Externally governed cluster
Character of competition	Cooperation	Co-opetition	
Stability	Typically stable, long-term relationships	More flexible and changing relationships are possible	
Embedding in the continuum	Between market and hierarchy	Between market and hierarchy, but closer to market	

The incentives for firms to participate in strategic networks or clusters and the advantages that they provide are numerous and in most cases applicable to both coordination modes. According to Maskell and Kebir (2006) and Brown et al. (2007) main benefits and goals of networks – and hence main research areas – are the increase of competitiveness, local knowledge spillovers, and the regional development.³³ The membership in a strategic network or a regional cluster enables a firm to specialize in its core competencies and to render its resource allocation processes more efficient because it can outsource some functions to other member firms. As Johanson and Mattsson (1987) and Jarillo (1988) state, this division of business is an element of market coordination enhancing a firm's competitiveness and is critical for the success of the network.³⁴

Whereas the increase of competitiveness is an advantage that is inherent in clusters as well as in strategic networks, other benefits identified by Maskell and Kebir (2006) and Brown et al. (2007), in particular local knowledge spillovers and the regional development, are more outstanding in regional clusters. Whereas

³² See Fromhold-Eisebith/Eisebith (2005), p. 1251.

³³ See Maskell/Kebir (2006), pp. 34-37 and Brown et al. (2007), pp. 4-6.

³⁴ See Johanson/Mattsson (1987), p. 34f., and Jarillo (1988), p. 35.

Maskell and Lorenzen (2004) accentuate knowledge creation and knowledge spillover as main benefits of networks,³⁵ Tallman et al. (2004) point out that a member firm can create a sustainable competitive advantage by having recourse not only to firm-specific, but also to cluster-specific knowledge.³⁶ In this context, Gilbert, McDougall and Audretsch (2008) examine that firms that are located in clusters are able to absorb more knowledge than firms outside the cluster and thereby enhance their innovation capacity.³⁷ Through the membership in a cluster firms get access to collective information, to distinct resources, markets or technologies and benefit from economies of scale and scope in their relationships.³⁸

Concerning the regional development, a cluster is more interconnected with the respective region, its image and the multitude of local firms, for the most part SMEs. Following Ricart et al. (2004), a cluster or the cluster manager fills an institutional void and thereby advances the competitiveness of a region.³⁹ For these reasons, cluster activities comply not only with entrepreneurial, but also with public missions and thus have to be seen in context with location marketing efforts.

3. Reduction of transaction costs realized by a cluster manager

First of all, it is essential to elaborate why it is preferable to employ a central cluster manager. Through the cooperation in a cluster, firms can specialize in activities that generate a competitive advantage, realize economies of scale and reduce the transaction costs incurred in their activities. This is the main benefit of cooperating pursuant Jarillo (1988).⁴⁰ If the number of members significantly rises, the installation of a central cluster manager – regardless of the type of governance – entails further economies of scale and scope, predominantly in the field of communication as well as information procurement and processing.⁴¹ There are convincing reasons that a professionally governed cluster acts more efficiently from a transaction cost perspective compared to a cluster without a central cluster manager. The cluster manager coordinates as an intermediary institution on the one hand the transactions between the members as well as on the other hand the transactions between the members and public cluster sponsors, such as, for example, the Federal Ministry of Education and Research or the European organizations allocating the European Structural Funds.

³⁵ See Maskell/Lorenzen (2004), p. 993.

³⁶ See Tallman et al. (2004), p. 268.

³⁷ See Gilbert/McDougall/Audretsch (2008), p. 417f.

³⁸ See Gulati/Nohria/Zaheer (2000), p. 203 and Bell (2005), p. 288.

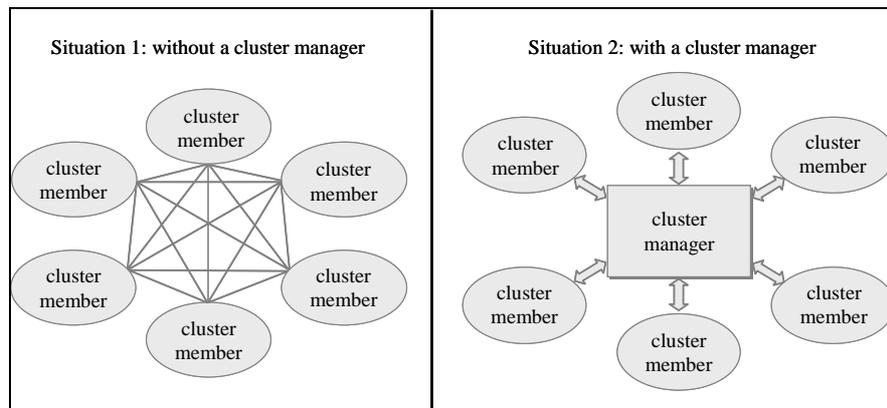
³⁹ See Ricart et al. (2004), p. 184f.

⁴⁰ See Jarillo (1988), p. 35.

⁴¹ See Williamson (1975), pp. 45-47.

As the in figure 1 developed model points out, a cluster manager reduces the number of ties between the members and thereby operates transaction cost-cutting. In situation 1, the size of the cluster is limited by the limits of information and communication processing. In such a network, it is costly to make joint decisions and to maintain the relationships.⁴² While in this case a maximum of $n*(n-1)/2$ ties between the cluster members are possible, the cluster manager in situation 2 lowers them to the number n .

Fig. 1: The ties between the cluster members with and without a cluster manager; source: own illustration referring to Williamson (1975), p. 46



Through this reduction of ties, the intermediary cluster manager limits the money and time the members spend to search for and evaluate each other, to negotiate over and to monitor the cooperation.⁴³ He realizes economies of scale and scope in collecting, bundling, assessing and providing information, and helps to match cooperation partners. Thus, he processes the transactions more efficiently if we compare it with situation 1 where the cluster members have to detect potential partners on their own.⁴⁴ However, with regard to transactions that aim at initiating cooperations, the transaction cost advantage of situation 2 is attached to the condition that the potential cooperation partners do not know each other. Otherwise, a bilateral arrangement between the partners occasions lower transaction costs. Furthermore, the cluster manager is able to offer services like joint marketing operations (e.g. participation in a fair), maintaining the member database, initiating cooperations and knowledge spillover, and organizing cluster events (e.g. workshops, benchmarking events). In addition, he interlinks the cluster with other clusters of related industries.⁴⁵

⁴² See Williamson (1975), p. 45f.

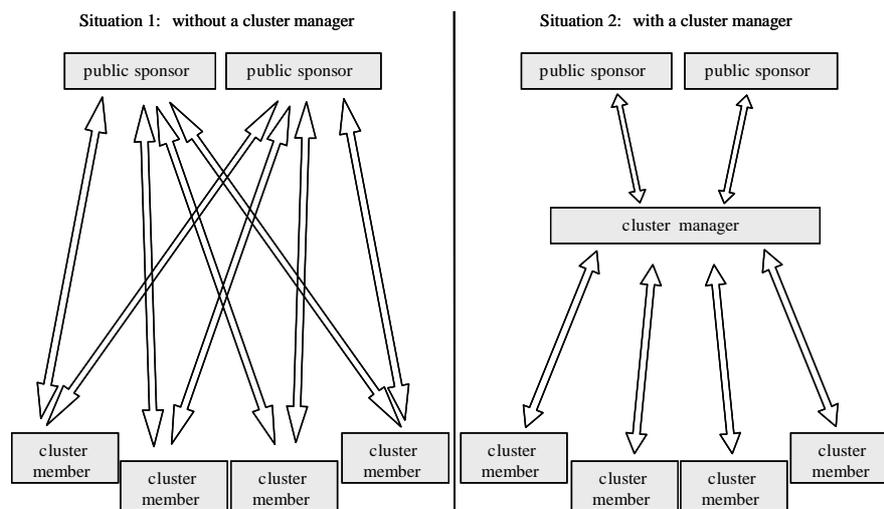
⁴³ See Spulber (2003), p. 255, and Spulber (1996), p. 145-149.

⁴⁴ See hereto analogously the discussion of an intermediary institution's role in Ricart et al. (2004), p. 184f.

⁴⁵ See Buhl/Meier zu Köcker (2009).

Beyond that, the cluster manager occupies an intermediary position in the relationships between the cluster members and the public cluster sponsors, as figure 2 illustrates. He equally lowers the number of ties in these relationships aiming at reducing the associated transaction costs compared to a situation without a cluster manager.

Fig. 2: The ties between the cluster members and the public sponsors with and without a cluster manager; source: own illustration.



Fundamentally, the cluster members benefit from the specialized intermediary institution in situation 2 because it is able to provide specific support and information, e.g. about the different application processes for public funds. In this context, the cluster manager is a central contact person that makes the members aware of distinct funding programs, informs them about the requirements and supports them in the application process. He thereby contributes to an efficient allocation of public funds. However, the cluster manager does not only transform information, but also money,⁴⁶ as the cluster management in a publicly initiated cluster receives public financial support which it passes on to the members by offering the mentioned services.

These models show that the cluster manager prohibits that the cooperations and relationships within the cluster are negatively influenced by the limited capability of information processing of its members. Nevertheless, additional administration and coordination costs that are caused by the installation of a central cluster management in situation 2 have to be taken into account in efficiency analysis. If they

⁴⁶ See Spulber (2003), p. 255, who argues that intermediaries also transform products or services they get from sellers before passing them on to buyers.

exceed the sum of economized transaction costs, we have identified an inefficient cluster. Certainly, the argumentation above demonstrates that the effect of lowering the transaction costs is expected to be so significant that these additional costs are unlikely to offset it.

4. How to staff the cluster management – an agency cost perspective

While a cluster manager is able to reduce transaction costs no matter if he is a member of an independent institution or a company manager, differences in efficiency may be stated regarding the control and agency costs. In the context of clusters, cluster members are modelled as principals that assign the cluster manager – who acts as an agent – with the configuration, maintenance and management of the cluster. Fundamentally, the cluster manager or the cluster management board should coordinate the network and align the interests of the involved cluster members.⁴⁷ In this context, Dhanaraj and Parkhe (2006) allot an important role to the network management in the brokering and recruitment activities where it has to minimize conflicts emerging from mistrust or opportunistic behavior on the part of the relationships between the members.⁴⁸ Nevertheless, agency problems also arise when the goals and interests of the involved cluster members and the cluster manager diverge and the latter has incentives not to integrate the members' objectives when designing and adjusting the cluster's strategy.

The considered relationships between the cluster members and the cluster manager are characterized by asymmetric and incomplete information, especially with regard to the respective goals. Assuming that economic actors aspire to maximize their individual utility and that the actors pursue different interests, problems based on goal conflicts and thereby resulting opportunistic behavior may emerge.⁴⁹ Following Williamson (1985), "opportunism refers to the incomplete or distorted disclosure of information, especially to calculated efforts to mislead, distort, disguise, obfuscate, or otherwise confuse."⁵⁰ Furthermore, the assumption of bounded rationality leads to intendedly rational behavior of the cluster manager which is in reality limitedly rational because of the limited capacities of humans to process information.⁵¹ Thereby resulting agency problems can negatively affect the cluster performance which can be either defined as the achievement of a superior competitive position through the management of innovative capacities or as

⁴⁷ See Winkler/Schemitsch/Kaluza (2008), p. 79, and Dhanaraj/Parkhe (2006), p. 660.

⁴⁸ See Dhanaraj/Parkhe (2006), pp. 661-664.

⁴⁹ See Picot/Dietl/Franck (2008), p. 72.

⁵⁰ See Williamson (1985), p. 47.

⁵¹ See Williamson (1996), p. 56.

the capability to advance and advertise the cluster as an outstanding location of the respective industry. Thus, mechanisms have to be installed in order to enhance the likelihood that the activities promote the attainment of cluster-level goals and to align the interests the best possible, which results in higher control and agency costs.⁵² More precisely, the members have to make costly efforts to verify and to monitor the cluster manager's behavior.⁵³ Following Kenis and Provan (2006) some form of control is necessary in networks or clusters "to coordinate network activities and to ensure that network-level goals, and not just organization-level goals, are achieved."⁵⁴

We assume that the incentives for a cluster manager to realize the whole cluster's goals and to enhance the cluster performance vary with the different governance modes described in chapter 2. Thus, we question in the following how incentives are built in the different types of cluster management to contribute to the resolution of goal conflicts and to promote cluster performance. As efficiency is the criterion for an effective cluster management, we analyze in how far the level of agency costs depends on the organizational embedding of the cluster management – either in the management of one or more member firms or in an independent institution. Therefore, these two modes of cluster governance are studied each regarding how the organizational embedding affects the amount of agency costs (1) in the selection process of cluster firms, (2) in the operationalization of the cluster strategy and (3) when coordinating specific investments. These categories are designed based on the four main functions of network managers identified by Sydow and Windeler (1994), whereby the functions of regulating and evaluating the network are subsumed in the operationalization of the cluster strategy.⁵⁵

4.1 Cluster management by managers of member firms

Dhanaraj and Parkhe (2006) emphasize the role of the hub firm in the selection process, in the processes of managing knowledge mobility, the appropriation of innovation rents and network stability.⁵⁶ While they demonstrate that the hub-firm can constrain opportunistic behavior and free-riding among the cluster members, they do not debate the possibility that agency problems emerge because of the pursuit of self-interests by the hub-firm itself. Provan and Kenis (2007) identify an asymmetrical distribution of power in such lead-firm governed networks, but assume that the goals of the hub-firm are aligned with the cluster goals.⁵⁷ From an

⁵² See Kenis/Provan (2006), p. 228.

⁵³ See Eisenhardt (1989), p. 58.

⁵⁴ Kenis/Provan (2006), p. 228.

⁵⁵ See Sydow/Windeler (1994), p.5, and Sydow (2006), pp. 408-413.

⁵⁶ See Dhanaraj/Parkhe (2006), p. 661.

⁵⁷ See Provan/Kenis (2007), p. 235.

economic perspective, we have to contest the assumed alignment of interests. The cluster manager who is part of a member firm or the hub-firm has strong incentives to promote his firm and to focus on the entrepreneurial alignment of the cluster. This entrepreneurial direction results in two different implications for the behavior of the cluster manager, which may be whether favorable or unfavorable for the cluster members:

On the one hand, the entrepreneurial orientation of the cluster manager can enhance the dynamics of the cluster. Being a firm manager, he might have a better understanding of the market dynamics and can transfer this knowledge to his job in the cluster. This can result in the cognition of chances and opportunities and thus in a dynamic development of the cluster which could strengthen its competitive position vis-à-vis other networks or clusters. Furthermore, as his personal utility is directly attached by financial bonuses, for example, to the firm performance, he can try to maximize the latter by using the possibilities emerging in the cluster, which is considered as positively by the cluster members as long as it is associated with the goals of the cluster.

On the other hand, entrepreneurial behavior may entail that the cluster manager prioritizes his own firm's interests higher than the cluster's interests. Guided by the behavioral assumption of self-serving orientation, a cluster manager who occupies at the same time a leading position in a member firm sets himself as his personal goal the maximization of the firm's profit. He is supposed to maximize it by means of his powerful position in the cluster, even if he derogates other cluster members or neglects common cluster goals. In how far this profit maximizing behavior leads to goal conflicts between the cluster and its manager, which mechanisms can be implemented to prevent such conflicts and how this affects the agency costs, will be analyzed in the following.

4.1.1 Selection of cluster members

A cluster manager actively selects potential member firms by purposefully addressing firms or by presenting the cluster at relevant events.⁵⁸ Vis-à-vis these potential future cluster members, he enters a second principal-agent-relationship. Being a principal this time, he has to screen the future members aiming at identifying possible hidden characteristics and at not being deluded by them. To enlarge the cluster, to bring together the best possible members or to manage complementarities between the members may serve as a point of reference for an efficient selection.

Focusing again on the initial principal-agent-relationship between the incumbent cluster members and the cluster manager, we can state that the members assume and expect the cluster manager to screen potential new members by impos-

⁵⁸ See hereto Sydow/Windeler (1994), p. 5, and Sydow (2006), p. 409f.

ing criteria that are optimal for the cluster as a whole. Referring to the management of complementarities through selecting well fitting partners, the entrepreneurial cluster manager certainly has knowledge advantages compared to an external cluster manager because he usually knows the regional firms and can specifically address them.

But there is uncertainty about the cluster manager's real qualities, his intention and efforts in the selection process. Being the agent in this case and at the same time part of a member firm, it seems to be rational for the cluster manager in this context of incomplete information to exploit his discretionary freedom⁵⁹ and to address and choose firms that are primarily beneficial to the development of his own firm. So, the criteria in the screening process are subjective and self-interested and the cluster manager thereby prefers to select firms that are advantageous for his own cooperation or research projects. If this aims at establishing a good fit between the cluster manager and the selected firm, there are sparse objections to his choice except that the interests of the incumbent members – the principal – might be not taken into account, which can lead to the external effect of diminishing profits for the rest of the cluster members.

Adding a time perspective to these considerations, the cluster manager's purpose to select firms by means of opportunistic criteria, even if he hinders the development of the whole cluster, appears to be short-term. Under the conditions described above, mistrust will emerge and predominate the relationships between the cluster members and the cluster manager, which consequently can bring the whole cluster to a halt.⁶⁰ Trust cannot arise in inter-firm relationships when "the partners determine that their expectations are either unmet or under met or that one partner is opportunistic or unreliable."⁶¹ Therefore, the cluster manager should be aware that, in the long term, the performance and the reputation of his firm increase when the whole cluster prospers. In order to assure and to elucidate to the other members that the membership can foster the competitiveness and innovation capacity of all, the cluster manager consequently has to make efforts to weaken the reproach of selecting cluster members opportunistically. He tries to enhance his credibility by signalling his will to accept all firms that are able to contribute to achieve common cluster goals. To put it another way, he signals his screening capacity to the cluster members, to his principal.

Nevertheless, because of the still incomplete information, the cluster members need to control the cluster manager's selection criteria and efforts. One mechanism to control the selection process could be to install a monitoring board composed by representatives of the cluster members that intends to decrease the information disadvantage of the cluster members. Both activities, signalling and monitoring, involve a certain amount of costs.

⁵⁹ See Williamson (1985), p. 47; Powell (1990), p. 297.

⁶⁰ See Lorenzoni (1995), p.154.

⁶¹ Adobor (2006), p. 126.

Besides the signalling and monitoring costs, the welfare loss that still remains counts among the agency costs.⁶² Welfare is lost because there is still persistent mistrust on the part of the cluster members and because possible residual opportunistic behavior on the part of the cluster manager cannot be excluded. In this situation, the agency costs are deemed to be high.

4.1.2 Operationalization of the cluster strategy

An important task of the cluster manager is to operationalize the cluster's strategy by organizing events as workshops, common fair stands, facility visits or round tables and by initializing cooperation and research projects. To manage this, the cluster manager regulates the relationships within the cluster, implements a common information and communication system, manages cooperation projects and evaluates the cluster members.⁶³ Therefore, he installs a platform for collaboration and communication and for the exchange of information. Furthermore, he is responsible for public relations, develops programmes for further training and supports the members in the acquisition of third-party funds.⁶⁴ Because of his knowledge and understanding of the industry and its development, the entrepreneurial cluster manager is able to seize promising ideas and to configure a demand-oriented set of operational measures. Nevertheless, based on the organizational embedding of the cluster manager in a member firm, some behavioral hazards can be derived.

With regard to his incentives to act opportunistically, the self-interest-seeking cluster manager might be motivated to pursue his own interests even if he harms the performance of some other firms or the whole cluster. The profit orientation underlies the decisions of the cluster manager and prevents him from taking decisions that focus on the long-term sustainable development of the cluster because he is primarily interested in his rents. Provan and Kenis (2007) already have raised this issue of a unilateral focus on the hub-firm's interests, but did not concentrate on the thereby resulting conflicts on an operational level.⁶⁵ As the interests of the cluster manager and the rest of the cluster members may diverge, he has some freedom, can act opportunistically and push the cluster development to a direction that is beneficial for his own company, but not for the entire cluster.

The cluster manager's discretionary freedom exists because the relationships within the network are characterized by the fact that the other cluster members cannot judge or evaluate the efforts that the cluster manager spends on organizing activities that seek to realize the optimal cluster strategy. For the cluster manager,

⁶² See Jensen/Meckling (1976), p. 309f.

⁶³ See Sydow/Windeler (1994), p. 5f., and Sydow (2006), pp. 411-413.

⁶⁴ See for example Buhl/Meier zu Köcker (2009).

⁶⁵ See Provan/Kenis (2007), p. 242.

it is rational in the context of incomplete information to apply his energy more to projects that advance his own firm than to those that necessarily advance the cluster. So, he has high incentives to limit his efforts concerning subjectively less promising cooperation or research projects and, from his perspective, poorly performing partners.⁶⁶

As this reluctance is not observable for the other members, mechanisms to align the interests or to monitor the cluster manager's activities and operational decisions have to be implemented in order to guarantee a sustainably successful cluster.

Concerning the alignment of interests, incentives for the cluster manager not to act opportunistically have to be created. In the long term, the interests of the cluster manager and the rest of the cluster members converge, when it is perceptible for him that his firm benefits from a promising cluster development. This can be either the case when he financially participates in long-term cooperation projects or when he benefits from reputational gains, for example, arising from the success of the cluster.⁶⁷ Then it is rational for him to secure the success of the cluster, which increases the profit generated within the network and thereby raises the profits that the hub-firm can appropriate sustainably. By signalling his will to promote the whole cluster, the cluster manager can contribute to build trust within the network, which is substantial for the transfer and exchange of knowledge. From the perspective of the cluster members, opportunistic behavior is considered less likely when the cluster manager credibly asserts his long-term intentions.⁶⁸

Even if the cluster manager signals his incentives not to act opportunistically, he will be supposed to do so because he still has discretionary freedom which he can exploit to the detriment of the other cluster members. Due to this suspicion of opportunism, the cluster has to invest in control and monitoring mechanisms to reduce the moral hazard arising through asymmetric information.⁶⁹ A monitoring board composed of members of cluster firms, research institutions and other stake holders, for example, can be charged with the definition of the strategy and with the monitoring of its implementation. This board has to ensure that the capabilities developed within the hub-firm are not reflected in a higher and self-interested impact of the firm on the appropriation of the cluster rents.⁷⁰

Agency costs in this case consist of the signalling as well as the monitoring costs, not neglecting possible welfare loss due to the hesitance of the members to trust in the cluster manager and due to residual opportunistic behavior that occurs because the implemented mechanisms fail.

⁶⁶ See Wincent/Anokhin/Boter (2009), p. 58.

⁶⁷ See Picot/Dietl/Franck (2008), p. 78f.

⁶⁸ See Jarillo (1988), p. 37.

⁶⁹ See Wohlgemuth (2002), p. 61.

⁷⁰ See Dhanaraj/Parkhe (2006), p. 667.

4.1.3 Central coordination of specific investments

One advantage for a firm or an institution of joining a cluster is that it hopes to benefit from knowledge spillover and knowledge transfer. Through providing a platform for collaboration and communication, a cluster manager can ascertain the realization of this advantage. He has the function to allocate resources in the cluster⁷¹ which can result in a further agency problem.

In the cluster context, an example for such a platform could be a common research laboratory, whose installation often is supported by public funds. The cluster manager, who is responsible for setting up and managing the use of the laboratory, has high incentives to operate it according to the specific needs of his firm and not to integrate the wants of the other involved actors. The cluster members recognize that the cluster manager could have the intention to make use of this laboratory predominantly for research projects that are beneficial to his firm and that he could try to deny the other members the access to the laboratory due to pretended capacity restraints, for example. This situation harbors a hold-up potential that the cluster manager can exploit. By exploiting the hold-up situation, the hub-firm seeks to strengthen its competitive advantage and impedes that the others could contest its dominant position in the network through extended research and development activities. The rest of the cluster members – in our case the principal – anticipate the hold-up situation, hence it is not profitable for them to invest specifically in the laboratory by providing human capital, for example. Therefore, they underinvest which consequently means that the laboratory is not provided to an optimal extent at the cluster-level. As a result, the public funds are not allocated efficiently in this common laboratory.

The problems resulting from the hold-up potential can be solved by granting contractual securities in respect of the configuration and the use of the laboratory or by using the reputation of the hub-firm as security and possibility to sanction the exploitation of the hold-up situation. Thereby, this aspect of reciprocity transforms the unilateral dependence in the relationship into a bilateral one.⁷² Hence, the cluster manager is interested in acting for the purpose of the cluster members because opportunistic behavior would entail more negative consequences through the impending sanctions than positive consequences.⁷³ Through the installation of these mechanisms, a misallocation of public funds can be prevented.

Due to the efforts to hedge against the exploitation of the hold-up situation, the incurring costs have to be considered as high. Besides, residual welfare loss cannot be excluded and is added to the agency costs, because it is probable that an optimal situation will not be attained despite the implanted sanction mechanisms.

⁷¹ See Sydow/Windeler (1994), p. 5f., and Sydow (2006), p. 411, and Buhl/Meier zu Köcker (2009), p. 27f.

⁷² See Williamson (1985), p. 190f.

⁷³ See Picot/Dietl/Franck (2008), p. 79f.

4.2 Cluster management by third-party managers

A cluster manager who is not part of a member company but rather member of an independent intermediary institution charged with the cluster management is an individual that is also driven by its personal interests. As his main task is to ensure that network goals are met⁷⁴, the external cluster manager is considered as successful by setting up and managing the cluster.

With regard to the inducement to enhance and promote cluster performance, a third-party cluster manager that is beyond economic competition seems to have lower incentives to foster actively the cluster's development. In order to guarantee a maximum of neutrality, external cluster managers often are employed as public servants and, as no performance-linked elements are integrated in their contracts, a dynamic and outstanding cluster performance will not increase their individual utility. Consequently, the cluster manager has weak performance incentives, which entails two behavioral implications: On the one hand, he is hardly motivated to make efforts to enhance the cluster's performance. On the other hand, however, a weak incentive structure leads to the insight that the external cluster manager is not driven by a bias towards distinct members or by an opportunistic propensity.⁷⁵

Which consequences can be deduced from this assumption for the removal of information asymmetries, the installation of conflict preventing mechanisms and the amount of agency costs, will be discussed in the following subchapters.

4.2.1 Selection of cluster members

Concerning the selection of cluster members, the independent cluster manager aims at addressing and accepting all firms that cover a relevant field of the cluster's activities, as far as he disposes of the knowledge to identify the future members. This seems to follow the same lines as the goals of the incumbent cluster members that expect the cluster manager to accept members that advance the development of the whole cluster. As the cluster manager has only low incentives to act opportunistically in this mode of governance, he is supposed to apply selection criteria that are almost adjusted to an optimal composition of the cluster in order to achieve long-term cluster objectives. An independent cluster manager is not likely

⁷⁴ See Provan/Kenis (2007), p. 236.

⁷⁵ This assumption is adopted by Hansmann (1980, 1987) who answers the question of why non-profit firms exist by reasoning that the value that is protected because of their weaker incentives to take personally advantage of their incompletely informed customers outweighs the inefficiencies in this governance form resulting, for example, from weak incentives to minimize cost or from the limited access to capital.

to exploit existing information asymmetries, which favors the creation of a transparent and trustworthy atmosphere. So, he tries to signal that he is willing to select future cluster members that are advantageous for the development of the whole cluster.

Nevertheless, an opportunistic propensity of the cluster manager cannot be completely excluded as he could use a short-term successful cluster as stepping-stone towards the next career level. Therefore, it is also important that he signals his screening capacity to the cluster members, which enhances the emergence of trust, and that certain monitoring mechanisms, as a monitoring board, for example, are implemented by the cluster members. The signalling and monitoring efforts as well as the welfare loss that results of still to a small extent incomplete information are added and amount to the agency costs.

4.2.2 Operationalization of the cluster strategy

The cluster manager disposes of a lot of instruments to operationalize the strategy of the cluster.⁷⁶ As he is subject to a weak incentive structure, his incentives to act opportunistically are scarce, analogously to the field of the selection of new members. He is interested in accomplishing his tasks and managing the cluster whereby he will neither make efforts to considerably promote the cluster nor vitiate its development. Thus, conflicts of interests are not immediately evident.

An independent cluster manager is inclined to depict all the relevant fields that are integrated in the respective industry without preferring one cluster member over another and without promoting self-interested goals. Hence, his efforts in initiating cooperations or workshops, for example, do not depend on in how far the cluster manager but the cluster benefits from it.

The cluster manager contributes to lower information asymmetries by credibly signalling and revealing his goals and implementation concepts. Thus, his discretionary freedom is small and only little monitoring efforts are required by the cluster members. From this it follows that little agency costs are involved in the context of the operationalization of the cluster strategy.

4.2.3 Central coordination of specific investments

An external cluster manager also assumes the task to allocate resources in the cluster and to coordinate central specific investments. Taking up the example of the research laboratory from subsection 4.1.3, we see that there is no hold-up potential that the cluster manager as agent could exploit.

⁷⁶ See subsection 4.1.2.

As he is not part of a cluster member and not directly involved in research projects, he does not have the intention or any incentive to benefit from the operation of the laboratory or to exclude others from its use. His primary focus in this context is to manage the cluster and its R&D activities by providing central resources that require specific investments. Taking into consideration capacity restraints and the characteristics of the single research projects, he can grant access to the interested cluster members and thus guarantee that the central resources are provided in a way which is optimal for the success of the cluster. Public funds that sponsored the installation of the research laboratory thus are allocated efficiently.

The central coordination of specific investments is that important because common sources, that the actors are not able to create as a single firm or institution, can be supplied to the members. The research laboratory, for example, is especially lucrative for SMEs that cannot afford own high-tech laboratories and for the members that want to cooperate in a neutral environment.

In this case, we have no relationship of unilateral dependence between the cluster manager and the cluster members that would demand to install mechanisms to convert it into bilateral dependencies. As the cluster members do not have to fear to be exploited by the cluster manager, they have incentives to invest specifically, so that the central resources are provided to an appropriate extent.

5. Discussion

All in all, we have noted that the discussed forms of governance show considerable differences in their incentive structure. In a participant-governed cluster, it is possible that the interests of the cluster manager and the cluster members diverge. As the cluster members cannot evaluate appropriately the qualities and actions of the cluster manager and thus have to deal with asymmetric and incomplete information, the discretionary freedom of the cluster manager is wide-ranging in this form of governance and implies more principal-agent-problems and higher agency costs than in externally governed clusters.

In particular, agency costs incur as follows: Regarding the selection process, we have stated that the cluster manager in a participant-governed cluster has more freedom and stronger incentives to pursue individual interests in selecting members and to act opportunistically than an independent cluster manager. This pertains equally for the operationalization of the cluster strategy. Therefore, in a participant-governed cluster, more effort has to be made to align the interests of the cluster members as principals and the cluster manager as agent and to monitor the latter. As a result, agency costs are higher when a cluster manager is part of a member firm. With regard to the central coordination of specific investments, an independent cluster manager is able to eliminate the hold-up potential that exists

in the relationship between a manager of a hub-firm and the cluster members and to ensure thereby the right amount of specific investments.

Hence, we can identify a trade-off between a cluster manager making efforts to enhance cluster performance and a neutral cluster manager: While a cluster manager who is part of a member firm is conducted by strong incentives to act opportunistically, he also has high incentives to integrate the entrepreneurial perspective in the cluster management and to enhance the dynamics of the cluster. An external cluster manager, indeed, has weak incentives to act self-interestedly and to hazard negative consequences for the cluster members, but is not motivated to make enormous efforts to promote the cluster.

As an implication of this trade-off, we assume that we have to differentiate different clusters which require different governance structures. Referring to the review of the different types of networks in section 2, there exist clusters that combine not only elements of clusters but also several elements of strategic networks, as rather stable, long-term relationships and the focus on cooperation, for example. Such clusters can be defined as vertical clusters characterized by the integration of the whole value chain and, especially, the supply chain. Vertical clustering lowers coordination costs and entails a finer segmentation of the value chain enabling the firms to increase their advantages resulting from specialization.⁷⁷ In vertically structured clusters, a lead-firm manager might be an appropriate cluster manager. He has knowledge advantages concerning the subcontractors and, thus, can identify and manage complementarities between the firms, develop them, and make use of them. Certainly, the other cluster members are aware of the discretionary freedom of the lead-firm, but they accept it and therewith the concentration on its interests, knowing that their profits depend directly on the profit of the hub-firm.

Whereas vertical clusters attach importance to the network of lead-firms and their suppliers, horizontal clusters predominantly address firms of the same level of the value chain which undertake similar activities.⁷⁸ The horizontal form of clustering emphasizes co-opetition and leads to a better comparability of the solutions produced under similar conditions.⁷⁹ In this competitive environment, superior solutions will prevail faster. In horizontally structured clusters, the success of the members depends on their capacity of continuously improving their problem solving mechanisms, and not directly on the performance of a single firm, as in vertical clusters. Therefore, the members of a horizontal cluster would not accept the predominant position of a lead-firm, but are willing to pass tasks like coordinating the network, initiating projects and marketing the location of the cluster on to an independent and neutral cluster manager.

⁷⁷ See Maskell (2001), p. 930-932.

⁷⁸ See *ibid.*, p. 928ff.

⁷⁹ See Bathelt/Malmberg/Maskell (2004), p. 36.

6. Conclusion and limitations

In a first step, after having delineated regional clusters and strategic networks, this paper has shown in how far transaction costs are reduced through the installation of a central cluster manager be it a hub-firm or an external cluster manager. In a second step, the paper argues that the agency costs in participant-governed clusters exceed the costs in externally governed clusters. As economic agents are guided by self-interest, internal cluster managers have incentives to maximize the benefits of their own firm, even if they harm the other members of the cluster. So, they can abuse their discretionary freedom, which they have due to incomplete and asymmetric information. By contrast, the paper hypothesizes that external cluster managers keep down the agency costs because they occupy a neutral position in the network and their personal utility is not directly interlinked with the success of the cluster. Hence, less signalling and monitoring activities are necessary and the welfare loss resulting from agency problems also is smaller than in participant-governed clusters. In the last step, the different forms of governance have been connected to the vertical or horizontal dimension of a cluster. It has been discussed that horizontal clusters might require a third-party cluster manager, whereas a vertical cluster can be participantly-governed.

This outcome contributes to the academic cluster research by elucidating the significance of incentives in the choice of a governance form. Furthermore, it opens the discussion of the organizational embedding of the cluster management and its particularities.

Nevertheless, the significance of this paper is limited due to its theoretical nature. To be able to recommend preferring one governance form over another, further qualitative and quantitative research has to clarify the conditions under which externally governed clusters perform better than participant-governed clusters and vice versa. Furthermore, the modes of cluster governance have to be refined. As Provan and Kenis (2007) have noted, participant-governed networks can be lead-firm governed as well as multi-firm governed networks.⁸⁰ We also have to distinguish several forms of externally governed clusters, as, for example, clusters organized as registered associations, clusters that are managed by a state ministry or clusters without any legal structure where the cluster manager is integrated into a research institution. The literature-based research in this paper has to be complemented in the next step with qualitative interviews with cluster managers who provide, due to their experience, important insights for the analysis of the governance of clusters. These interviews promise to sustain the generation of hypotheses based on the argumentation of the present paper.

⁸⁰ See Provan/Kenis (2007), p. 234.

References

- Adobor, H. (2006): "Inter-firm Collaboration: Configuration and Dynamics", in: *Competitiveness Review*, Vol. 16 (2), pp. 122-134.
- Bathelt, H.; Malmberg, A.; Maskell, P. (2004): "Clusters and knowledge: local buzz, global pipelines and the process of knowledge creation", in: *Progress in Human Geography*, Vol. 28 (1), pp. 31-56.
- Bell, G.G. (2005): "Research notes and commentaries. Clusters, networks, and firm innovativeness", in: *Strategic Management Journal*, Vol. 26, No. 3, pp. 287-295.
- Benston, G.J.; Smith, C.W. (1976): „A Transactions Cost Approach to the Theory of Financial Intermediation“, in: *Journal of Finance*, Vol. 31 (2), pp. 215-231.
- Brown, K.; Burgess, J.; Festing, M.; Royer, S.; Steffen, C.; Waterhouse, J. (2007): "Towards a New Conceptualisation of Clusters", in: Chapman, R. (ed.): *Proceedings of ANZAM (Australian and New Zealand Academy of Management)*, Sydney, pp. 1-13.
- Buhl, M.; Meier zu Köcker, G. (2009): „Innovative Netzwerkservices. Netzwerk- und Clusterentwicklung durch maßgeschneiderte Dienstleistungen“, Bundesministerium für Wirtschaft und Technologie, Berlin.
- Bührer, S.; Kroll, H.; Stahlecker, T.; Brandt, T.; Zimmermann, A.; Kulicke, M.; Koschatzky, K.; Baier, E. (2008): „Zwischen-Evaluation der Cluster-Offensive Bayern. Abschlussbericht, Fraunhofer Institut für System- und Innovationsforschung (ISI), Dezember 2008“, n.p.
- Coase, R.H. (1937): "The nature of the firm", in: *Economica*, Vol. 4, pp. 386-405.
- Dhanaraj, C.; Parkhe, A. (2006): "Orchestrating Innovation Networks", in: *Academy of Management Review*, Vol. 31 (3), pp. 659-669.
- Eisenhardt, K.M. (1989): "Agency Theory: An Assessment and Review", in: *Academy of Management Review*, Vol. 14 (1), pp. 57-74.
- Fromhold-Eisebith, M.; Eisebith, G. (2005): "How to institutionalize innovative clusters? Comparing explicit top-down and implicit bottom-up approaches", in: *Research Policy*, Vol. 34 (8), pp. 1250-1268.
- Gallup Organization (2006): "Innobarometer on cluster's role in facilitating innovation in Europe. Analytical Report", n.p.
- Gilbert, B.A.; McDougall, P.P.; Audretsch, D.B. (2008): "Clusters, knowledge spillovers and new venture performance: An empirical examination", in: *Journal of Business Venturing*, Vol. 23, No. 4, pp. 405-422.
- Gulati, R.; Nohria, N.; Zaheer, A. (2000): "Strategic Networks", in: *Strategic Management Journal*, Vol. 21 (3), pp. 203-215.
- Hansmann, H.B. (1980): "The Role of Nonprofit Enterprise", in: *The Yale Law Journal*, Vol. 89 (5), pp. 835-901.
- Hansmann, H.B. (1987): "Economic theories of nonprofit organizations", in: Powell, W.W. (ed.): "The Nonprofit Sector: A Research Handbook", Yale University Press, New Haven.

- Jarillo, J.C. (1988): "On strategic networks", in: *Strategic Management Journal*, Vol. 9 (1), pp. 31-41.
- Jarillo, J.C. (1993): "Strategic networks: Creating a borderless organization", Oxford.
- Jensen, M.C.; Meckling, W.H. (1976): „Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure“, in: *Journal of Financial Economics*, Vol. 3 (4), pp. 305-360.
- Johanson, J.; Mattsson, L.G. (1987): "Interorganizational Relations in Industrial Systems: A Network Approach Compared with the Transaction-Cost Approach", in: *International Studies of Management and Organisation*, Vol. 17 (1), pp. 34-48.
- Kenis, P.; Provan, K.G. (2006): „The Control of Public Networks“, in: *International Public Management Journal*, Vol. 9 (3), pp. 227-247.
- Khanna, T.; Palepu, K. (2003): "Multinationals as Global Intermediaries", in: *Harvard Business School Note*, pp.1-16.
- Larson, A. (1992): "Network dyads in entrepreneurial settings: a study of the governance of exchange relationships", in: *Administrative Science Quarterly*, Vol. 37, pp. 76-104.
- Lechner, C.; Dowling, M.; Welp, I. (2006): „Firm networks and firm development: The role of the relational mix“, in: *Journal of Business Venturing*, Vol. 21, No. 4, pp. 514-540.
- Lorenzoni (1995): "Creating a Strategic Center to Manage a Web of Partners", in: *California Management Review*, Vol. 37 (3), pp. 146-163.
- Maskell, P. (2001): "Towards a Knowledge-based Theory of the Geographical Cluster", in: *Industrial and Corporate Change*, Vol. 10 (4), pp. 921-943.
- Maskell, P.; Kebir, L. (2006): "What qualifies as a cluster theory?", in: Ashem, B.; Cooke, P.; Martin, R. (eds.): "Clusters and regional development – critical reflections and exploration", Routledge, London and New York, pp. 30-50.
- Maskell, P.; Lorenzen, M. (2004): "The Cluster as Market Organisation", in: *Urban Studies*, Vol. 41 (5/6), pp. 991-1009.
- Motoyama, Y. (2008): „What Was New About the Cluster Theory?: What Could It Answer and What Could It Not Answer?“, in: *Economic Development Quarterly*, Vol. 22 (4), pp. 353-363.
- Nassimbeni, G. (1998): "Network structures and co-ordination mechanisms. A taxonomy", in: *International Journal of Operations & Production Management*, Vol. 18 (6), pp. 538-554.
- Picot, A.; Dietl, H.; Franck, E. (2008): "Organisation. Eine ökonomische Perspektive", Stuttgart.
- Porter, M.E. (1998a): "Clusters and the New Economics of Competition“, in: *Harvard Business Review*, Vol. 76, November-December, pp. 77-90.
- Porter, M.E. (1998b): "On Competition", Boston.
- Porter, M.E. (2000): "Location, Competition, and Economic Development: Local Clusters in a Global Economy“, in: *Economic Development Quarterly*, Vol. 14 (1), pp. 15-34.

- Powell, W.W. (1987): "Hybrid organizational arrangements: new form or transitional development?", in: *California Management Review*, Vol. 30 (1), pp. 67-87.
- Powell, W.W. (1990): "Neither Market nor Hierarchy: Network Forms of Organization", in: *Research in Organizational Behavior*, Vol. 12, pp. 295-336.
- Provan, K.G.; Fish, A.; Sydow, J. (2007): "Interorganizational Networks at the Network Level: A Review of the Empirical Literature on Whole Networks", in: *Journal of Management*, Vol. 33, No. 3, pp. 479-516.
- Provan, K.G.; Kenis, P. (2007): "Modes of Network Governance: Structure, Management, and Effectiveness", in: *Journal of Public Administration Research and Theory*, Vol. 18, No. 2, pp. 229-252.
- Ricart, J.E.; Enright, M.J.; Ghemawat, P.; Hart, S.L.; Khanna, T. (2004): "New frontiers in international strategy", in: *Journal of International Business Studies*, Vol. 35, No. 3, pp. 175-200.
- Siebert, H. (2006): "Ökonomische Analyse von Unternehmensnetzwerken", in: Sydow, J. (ed.): „Management von Netzwerkorganisationen. Beiträge aus der Managementforschung“, Wiesbaden, pp. 7-27.
- Spulber, D.F. (1996): „Market Microstructure and Intermediation“, in: *Journal of Economic Perspectives*, Vol. 10 (3), pp. 135-152.
- Spulber, D.F. (2003): "The Intermediation Theory Of The Firm: Integrating Economic And Management Approaches To Strategy“, in: *Managerial and Decision Economics*, Vol. 24 (4), pp. 253-266.
- Sydow, J. (1992): „Strategische Netzwerke: Evolution und Organisation“, Wiesbaden.
- Sydow, J. (2006): „Management von Netzwerkorganisationen – Zum Stand der Forschung“, in: Sydow, J. (ed.): „Management von Netzwerkorganisationen. Beiträge aus der Managementforschung“, Wiesbaden, pp. 387-471.
- Sydow, J.; Windeler, A. (1994): „Über Netzwerke, virtuelle Integration und Interorganisationsbeziehungen.“, in: Sydow, J.; Windeler, A. (eds.): *Management interorganisationaler Beziehungen – Vertrauen, Kontrolle und Informationstechnik*. Opladen, pp. 1-21.
- Sydow, J.; Windeler, A. (1998): "Organizing and Evaluating Interfirm Networks: A Structurationist Perspective on Network Processes and Effectiveness", in: *Organization Science*, Vol. 9 (3), pp. 265-284.
- Tallman, S.; Jenkins, M.; Henry, N.; Pinch, S. (2004): "Knowledge, clusters, and competitive advantage", in: *Academy of Management Review*, Vol. 29 (2), pp. 258– 271.
- Thorelli, H.B. (1986): „Networks: Between Markets and Hierarchies“, in: *Strategic Management Journal*, Vol. 7 (1), pp. 37-51.
- Williamson, O.E. (1975): "Markets and Hierarchies: Analysis and Antitrust Implications – A Study in the Economics of Internal Organization“, New York.
- Williamson, O.E. (1985): "The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting“, New York.
- Williamson, O.E. (1996): "The Mechanisms of Governance“, New York.

- Wincent, J.; Anokhin, S.; Boter, H. (2009): "Network board continuity and effectiveness of open innovation in Swedish strategic small-firm networks", in: *R&D Management*, Vol. 39 (1), pp. 55-67.
- Winkler, H.; Schemitsch, H.B.; Kaluza, B. (2008): „Principal-Agent-Probleme in projektorientierten Wertschöpfungsnetzwerken – Problemidentifikation und Lösungsansätze“, in: Becker, J.; Knackstedt, R.; Pfeiffer, D. (eds.): „Wertschöpfungsnetzwerke – Konzepte für das Netzwerkmanagement und Potenziale aktueller Informationstechnologien“, Heidelberg, pp. 65-85.
- Wohlgemuth, O. (2002): „Management netzwerkartiger Kooperationen. Instrumente für die unternehmensübergreifende Steuerung“, Wiesbaden.