THE COMPARATIVE COSTS AND BENEFITS OF NETWORKING AND HIERARCHIES

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Abstract

This paper seeks to attract notice to the issue of networking costs. We analyze essential cost components of networking, and establish a *tertium comparationis*, i.e. a simple heuristic model, which allows for the comparative analysis of different governance modes. By drawing upon non-linear relationships between network activity and the cost-value ratio of networking, our framework asserts that too extensive a reliance on network resources might raise the relative value of the opportunity, implying a competitive disadvantage for interconnected firms. In stressing that differences in network value creation may not only be driven by firm- and relation-specific factors, but also by network activity itself, this paper entails several implications for the empirical investigation of actual networking strategies. We provide preliminary evidence for our main propositions using a sample of 150 franchisees. (132 words)

Keywords: forms of governance, costs of networking, non-linear costs and benefits of networking, cooperation, opportunity costs of networking.

The Comparative Costs and Benefits of Networks and Hierarchies

1 Introduction

A fast growing body of literature, emerging from a wide array of academic perspectives, deals with the subject of hybrid governance modes, in particular, network forms of organization. Basically, this literature sheds light on the question whether to produce a certain good or service in-house or not and, thus, addresses one of the most fundamental issues in strategic management, i.e., the choice of organizational structure. Yet, previous studies most notably stress the *beneficial* effects of networking. Organizational scholars and sociologists for example certify network forms of organization superior functionality regarding learning and knowledge transfer, resource acquisition or legitimization issues (e.g. Powell et al. 1996; Uzzi, 1997; Gulati, 1995; Baum & Oliver, 1991; Starr & Macmillan, 1990). However, despite the intensive debate on collaborations, dysfunctionalities and costs of networking still remain underexplored. This shortcoming in turn exacerbates an in-depth understanding of how collective action is organized (Parkhe, Wasserman, & Ralston, 2006). In this vein, Podolny & Page (1998) state that…

> *"…this attention to the functionality of network forms of organization explains why economic actors rely on network forms of organization, but it does not explain why they do not."*

More precisely, the focus on the benefits of networking could explain varying reliance on networks *between* industries, since the relevance of certain benefits such as learning and knowledge transfer differs from industry to industry. But, it still remains unclear why a fraction of actors *within* an industry still relies on hierarchical governance modes and hence, does not invest in social capital. Typically, firms value potential benefits of investment opportunities in physical capital (e.g. a production facility for in-house fabrication) on the basis of market-oriented interest rates. These interest rates resemble the opportunity costs of investment and, thus, serve as a basis for decision making. However, just as financial capital comes at a cost, social capital is not for free either.

This paper seeks to attract notice to the issue of networking costs. We analyze essential cost components of networking, and establish a *tertium comparationis*, i.e. a simple heuristic model, which allows for the comparative analysis of different governance modes. Specifically, by drawing upon non-linear relationships between network activity and the cost-value ratio of networking, our framework asserts that too extensive a reliance on network resources might raise the relative value of the opportunity, implying a competitive disadvantage for in-

terconnected firms. Thus, incorporating an opportunity cost calculus, i.e. net benefits from alternative governance modes, might help explaining why economic actors do not always perceive networks as a panacea and deliberately choose other forms of organization from the outset. In stressing that differences in network value creation may not only be driven by firm- and relation-specific factors, but also by network activity itself, this paper entails several implications for the empirical investigation of actual networking strategies.

The structure of this paper is as follows. Chapter 2 gives a short overview over the theoretical background. In particular, we introduce the costs and benefits of networking, their respective components and their development with respect to different levels of networking activity, i.e. the number of network partners. A simple heuristic model summarizes our thoughts on the cost-benefit ratio of networking. This article concludes with an empirical example in chapter 3 and a short summary in chapter 4.

2 Theoretical foundations and heuristic model

Despite recent literature's intensive debate network forms of organization, related theories still remain a loosely connected set of concepts implying numerous underexplored issues (for a brief review cp. Parkhe, Wasserman, & Ralston, 2006). The diversity of scientific perspectives on network forms of organization might have contributed to this fact. Whereas economic research mainly focuses on transaction cost minimization issues in the context of dyadic tie formation, i.e. strategic alliances, long-term buyer-supplier relationships etc. (Williamson, 1985; Kogut, 1988) sociologists' network approach emphasizes the consideration of strategic benefits from optimizing not just a single relationship but the firm's entire network of relationships (Gulati, Nohria, & Zaheer, 2000). The social network approach emphasizes positive effects of firms' relational and structural embeddedness (Granovetter, 1973) on features such as learning, resource accessibility or, generally speaking, the generation of social capital (e.g., Burt, 2005; Nahapiet & Ghoshal, 1998; Powell, 1990; Uzzi, 1997). Hence, scholars have been furthering our understanding of how dyadic tie formation may result in valuable relationships by means of a cost minimizing setup of effective governance regimes. And, which network-level strategies result in maximized benefits. However, both views have been criticized for neglecting the flip side of the coin, i.e. differing value effects of single ties on the one hand (e.g. Zajac & Olsen, 1991), and the network-level costs of tie formation and maintenance on the other hand (e.g. Labianca & Brass, 2006).

Transaction cost theory argues that high asset specificity results in high costs of market usage, i.e. search costs, costs of contract design, monitoring and enforcement. This mainly

follows from the central assumption that economic actors behave opportunistically and, consequently, do their utmost to maximize individual benefits. Hence, installing effective formal safeguards (e.g. a legal contract) against appropriation hazards in an uncertain environment is difficult and expensive, implying a transaction cost advantage of hierarchical governance modes under high asset specificity (Williamson, 1985). Network theorists emphasize that transaction cost theory unveils a critical limitation here. Misconceiving that transactions can be treated as isolated entities or discrete events and furthermore disregarding the potential development of informal or relational safeguards such as norms and trust (Zajac & Olsen, 1991; Jones, Hesterly, & Borgatti, 1997). For instance, transaction economists object that the prospect of repeated interactions with one partner even intensifies moral hazard as a result of the fundamental transformation: the number of alternatively available transaction partners decreases in expanding contract duration because of transaction-specific investments and specialization (Williamson, 1985). Thus, seen from the transaction cost economics point of view repeated interaction amplifies the risk of exploitation and as a consequence raises transaction costs. In contrast, network theorists stress that if transactions are evaluated in the context of the history of prior events and other related transactions a network form of organization can even lower transaction costs (Dore, 1983; Gulati, 1995; Gulati, Nohria, & Zaheer 2000, Zajac & Olsen, 1991). As an example, repeated interactions with one partner can enhance social norms as well as trust and thereby alleviate hold-up problems insofar as transacting parties anticipate voluntary cooperative behavior instead of opportunism.

We define a network form of organization as any collection of actors ($n > 2$) that pursue repeated, enduring exchange relations with one another. Thereby, networks can comprise different kinds of actors and relations. Actors can be any kind of social unit, including individuals, firms and organizations. Relations can be any kind of linkage, for instance, formal role relations, social interactions, and workflows as well as any kind of exchange of material and immaterial resources (Contractor, Wasserman, & Faust, 2006). This definition includes a wide range of joint ventures, strategic alliances, franchises, knowledge sharing or outsourcing agreements (Podolny & Page, 1998). The value of networks for economic institutions such as firms resides in their ability to provide efficient access to critical information and resources, thereby enabling their members to gain competitive advantage (Fortune, 2003). In a recent article Lavie (2006) advanced the strategic management literature by extending the resource-based view to networks as units of analysis. Incorporating network resources of interconnected firms, the author offers a systematic theoretical explanation of alliance members' competitive advantages. In particular, he explains how firm-, relation-, and partner-specific factors

affect network resources' contribution to the amount of rents extracted from alliance networks. To facilitate empirical testing of his propositions, Lavie (2006) develops an integrated model of both well received and newly established types of rent – namely, the internal, relational, inbound spillover and outbound spillover rent, all of which are determined in their size by the combined value and rarity of shared and non-shared resources. Lavie (2006) provides an excellent contribution to further our understanding of how economic rents are generated through applying resources which are external to the firm. Nevertheless, as stated by the author himself (Lavie, 2006: 651), one shortcoming may limit the empirical testability of the model, i.e. the negligence of networking costs in general and the lack of an opportunity cost calculus specifically. From this follows the implicit assumption, that networking will always entail positive rents.

Why should network dysfunctionalities and costs of network forms of organization be taken into consideration? Though scholars emphasize that data on alliance failure is hard to obtain, the scarce empirical evidence reports on a very high percentage of strategic alliances (more than 50%) which either do not operate the way they are supposed to or even fail (Kogut, 1988; Page & Podolny, 1998; Park & Ungson, 2001; Parkhe, 1993; Porter, 1987). In case of alliance failure, one cannot reasonably argue that the involved parties abandon their main strategies and economic goals. Rather, one should assume that – in most cases – alternative governance modes have become superior relative to the alliance form in terms of costs and benefits, implying a competitive *disadvantage* for interconnected firms. For a governance form to be superior, it must yield more efficiency than other governance forms in terms of adapting, coordinating and safeguarding exchange (Williamson, 1991; Jones, Hesterly, & Borgatti, 1997). Hence, integrating costs of networks, in general, and opportunity costs, specifically, is a necessary precondition for measuring a competitive advantage. This could also explain why economic actors do not always perceive networks as a panacea and deliberately choose other forms of organization from the outset.

2.1 The costs and benefits of networking

Generally speaking, the value resulting from a focal firm's network tie depends on the content, intensity and form of the dyadic relation, as well as on the overall network structure it is embedded in (Powell & Smith-Doerr, 1994). As already outlined above, network relations can comprise a wide array of contents like the transfer of goods or services, assistance, information or formal role relations. Thereby, dyadic relations can be either of a unilateral or mutual form. The intensity of those relations reflects different dimensions of exchange such as the

frequency of usage, the extent to which resources are transferred and the relation's importance for the firm – this in turn resulting from the existence of complementarities between the partners (e.g. Baranson, 1990). One main advantage of intense relations is the exchange of complex and tacit knowledge (Nahapiet & Ghoshal, 1998). Moreover, strong relations are reliable in terms of assistance, can provide legitimation and typically allow a better and more frequent recourse to external resources. However, weaker ties hold the value of increased flexibility given that less trust building is necessary to establish such relations. Provided that the overall network structure offers actor heterogeneity, weak ties give access to more diverse and rather codified information (Granovetter, 1973). The net effect of different levels of intensity or form depends on the network's purpose and other facets, particularly, the overall network structure.

Important metrics of network structure with respect to the assessment of network value are density, heterogeneity and size (Burt, 1992; Witt & Rosenkranz, 2002). Density is the proportion of ties in a network relative to the total number possible (Wassermann & Faust, 1994). The related concept of structural embeddedness can be defined as the extent to which dyad's mutual contacts are connected to one another, i.e. in how far parties are connected indirectly by third parties this in turn influencing the degree of information flow (Granovetter, 1973, 1992). Heterogeneity and size measure the variety and the number of actors within the network, respectively. It is worth noting that, all else equal, and with growing network size, density decreases because actors are limited in management capacity and the number of possible ties increases exponentially (Granovetter, 2005). Overall, network structure can hinder or facilitate the development and diffusion of values, norms and information on other actors' actual behavior and thereby serves as foundation for the development of social mechanisms which coordinate and safeguard exchanges in networks (Jones, Hesterly, & Borgatti, 1997). In this respect, network structure affects another main influence factor on the value of a focal firm's ties: the cost of networking.

The costs of networking not least emanate from three basic requirements: the need to control, the need to coordinate, and the need to reciprocate (Gulati & Singh, 1998; White & Siu-Yun Lui, 2005). The danger of being exploited by an opportunistic exchange partner requires the establishment of certain safeguards. The purpose of a safeguard is to provide, at minimum cost, the control and 'trust' that is necessary for transactors to believe that the exchange will make them better off (Williamson, 1985). However, formal safeguards such as legal contracts between parties typically codify only a small subset of obligations while the lion's share of relevant obligations is determined informally (Buckley & Casson, 1988; Park & Ungson,

2001). Moreover, not all cooperative ties do comprise or demand contractual agreement, which puts even more emphasis on the establishment and functionality of informal safeguards. Informal safeguards such as trust and commonly shared norms of behavior can lower transaction costs as they reduce the need for costly contracting and monitoring. Trust is the expectation held by a trustor (i.e., a representative of a firm) that one or several trustees (i.e., representatives of another firm or other firms) will cooperate (i.e., not act dishonestly or otherwise opportunistically against the trustor), even if the trustor holds no power over the trustee to ensure that he does so (Sako, 1992; Lorenzen, 2002). However, building trust implies considerable up-front investment into the relationship and needs to be cultivated as the relation matures (Dyer, 1997). The amount of investment thereby depends on the parties' basic willingness to cooperate and on the incentives to defect. Small networks can foster the emergence of trust, given that reputation can leverage group conform behavior (Henrich, 2004). Low information transfer costs make it likely that information on non-cooperative behavior – eventually in the form of gossip – will spread. Consequently, parties will try to protect their reputation by behaving cooperatively (Burt, 2005).

Differences in resources and capabilities are a key reason for cooperation between two or more firms (Sakakibara, 1997; Hamel, 1991). However, these differences might entail a lack in organizational fit, e.g. caused by a divergence in believes and culture. In order to overcome these structural incompatibilities, firms need to invest a certain amount of time and effort to communicate and coordinate, even in the absence of opportunistic appropriation hazards (Doz, 1996).

The very logic of networking is mutual exchange driven by reciprocity (Witt, 2004). In contrast to altruism, reciprocity is a conditional behavioral pattern which can be described as a demand to return favor for favor, and harm for harm (Fehr & Gächter, 1998). In other words, the extent to which a party cooperates in a dyadic relationship hinges on the perception whether the exchange partner acted in a friendly way (or is likely to act friendly in future), or not. The classification of interactions being friendly or harmful is affected by equity considerations. That is, an actor in an exchange relation will expect that the rewards of each actor be proportional to his input (Homans, 1961). However, the perception of the individual cost-benefit ratio is strongly influenced by his perception of other actors' ratios (Adams, 1963), which implies that exchange relations between more than two partners require considerably greater efforts to monitor interactions and contributions. Hence, if an actor perceives an exchange relation to be imbalanced, he is likely to lower his contribution. From this follows, that every resource or benefit a party receives from one of its network partners comes with an

obligation to reciprocate. In many cases these obligations can directly be translated into monetary values, e.g. the value difference between the market price of a resource and the price granted by the exchange partner. Sometimes these obligations even outweigh the value of the underlying exchange good (Granovetter, 2005), suggesting that – ultimately – there ain't no such thing as a free lunch.

Network ties do not only offer options but also entail constraints (Portes & Sensenbrenner, 1993; Parkhe, 1993; Uzzi, 1996; Granovetter, 1992). For example, on a relational level, relationships might hinder from alternative tie establishment. Hence, ties can generate opportunity costs, either because relations are exclusive, in the sense that a current partner would assess an engagement with a direct competitor as an unfriendly act (Gulati, Nohira, & Zaheer, 2000), or because ineffective ties – e.g. resulting from environmental change – cannot be cut and substituted due to negative reputational effects. Even though only few benefits are expected for the future, failure to reciprocate may result in strong sanctions and in a serious damage to the reputation of being a trustful contact (Gargiulo & Benassi, 1999; Labianca & Brass, 2006). Networking might not only entail relational and structural but also cognitive lock-in effects (Fried, Knoll, & Duschek, 2006). Frequent interaction and tight relationships foster the development of commonly shared interpretative patterns (Nahapiet & Ghoshal, 1998). Hence, parties embedded in close networks can find it difficult to make individual choices because they are so locked into believes and behavior that have become routine. One possible consequence of this organizational "arthritis" is an increasing likelihood of failures (Burt, 2005).

2.2 Network activity and the cost-benefit ratio of networking

Several studies implicitly assume a linear additive relationship between the connectedness of a firm and the value effects of additional shared resources. We have concerns about this view since we believe that this assumption may only hold for a limited range of network activity levels.

In the beginning of the network formation process – at low levels of networking activity – the average costs of tie formation and maintenance are considerably high. The firm that initiates networking activities is likely to have less experience in formal contract negotiation, cannot resort to standardized action patterns in terms of alliance formation and has only little reference for potential network partners signaling the own trustworthiness. The firm has to bear a high amount of fixed costs: Ties that do not have any precedent are very expensive (Burt, 2005), because the firm needs to gather a lot of information on e.g. objectives, the potential partner's resource base, his reputation and/or the partner's cooperative abilities. Additionally,

there are reciprocity based costs of signaling cooperative behavior. Gift exchange, involving the provision of valuable information or critical resources at no cost, may need to take place in order to overcome a lack of trust (Grabowski, 1999), aiming to fuel the mechanisms of reciprocity.

At moderate levels of network activity, the costs for the establishment of formal safeguards against opportunistic risks and appropriation hazards (i.e. contract formulation, enforcement etc.) may decline due to the development of routines and specific experience in contract negotiation. A growing number of network partners furthermore facilitate the establishment of new ties. Gulati (1995) found that the ability of network tie formation positively correlates with the number of preexisting ties, for example. The reputation of being a trustworthy exchange partner reduces signaling efforts on the one hand, and indirect contact established by third parties reduces the costs of information asymmetries on the other hand. Firstly, the growing number of network partners gives rise to the development of social mechanisms such as trust and commonly shared norms which foster cooperative behavior (Lorenzen, 2002). Reputational lock-ins – due to potential observation of non-cooperative behavior by common partners – can furthermore reduce opportunism induced costs (Coleman, 1990; Burt & Knez, 1995).

At high levels of network activity and with a growing number of links, it is reasonable to assume that rising coordination costs increase the average costs of networking (White & Siu-Yun Lui, 2005). Furthermore, a very large network might lead to the breakdown of informal institutions which eventually leads to rising costs of control (Davis, 2006). Particularly, increasing the number of partners can limit the level of trust within the network. In this vein, Granovetter (2005: 34) states that: *"the larger the group, the lower its ability to crystallize and enforce norms, including those against free riding."* Monitoring each partner's contributions, exchanging information on inadequate behavior and appropriate sanctions in the face of free riding necessitates great efforts (Gulati & Singh, 1998). Hence, less information about reputation and less peer control increase the likelihood that a tie's net value will be negative (Podolny & Page, 1998). Consequently, at high networking activity levels, and with a growing number of links, it becomes more likely that a firm experiences increasing opportunism and therefore higher costs of control. This fact may lead to a decline of the cost-benefit ratio of networking and to the perception that the network size exceeds a reasonable limit.

Turning to the benefits of networking, we presume that the amount of benefits obtained is initially increasing in network activity, firstly, because of relatively low-priced acquisitions of scarce resources – such as reputation, market knowledge or financial capital –, and, secondly,

because of benefits from specialization (Park & Ungson, 2001). Furthermore, positive externalities increase the benefits derived from networking; e.g. a broader base of partners and increasing interactions deepen the understanding of partner specific capabilities and facilitate the identification of required resources and information, implying a more effective use of network ties (Argote et al., 2003). In terms of information transfer, increasing interaction strengthens the knowledge base of the involved partners and, hence, improved absorptive capacities lead to greater effectiveness in knowledge exchange (Powell et al., 1996; Cohen & Levinthal, 1990). A growing network size might also lead to increased benefits from public goods such as group status and reputation or e.g. brand awareness in the case of franchising.

However, some of the ties do outlive the duration of their functionality, and restricted tie breaking capabilities caused by reputational costs entail diminishing benefits (Podolny & Page, 1998; Portes & Sensenbrenner, 1993). This follows from limited management capabilities. With the broadening of networking activities, inefficiencies in information flows may arise. A higher number of network partners may exacerbate intensive exploitation of connections, eventually leading to decreasing benefits – e.g. losses in innovativeness because of overembeddedness –, from further network extensions (Uzzi, 1996, 1997). Moreover, scarce management capacity can lead to decreasing reciprocity based benefits. With an increasing number of network partners, the focal firm may not be able to maintain the intensity of interaction with former partners. Following the logic of reciprocity, these partners will limit their input as well (Witt, 2004). Consequently, at high network activity levels, and with a growing number of links, it becomes more likely that a firm experiences decreasing cooperative intensity. This fact may lead to a decline of the cost-benefit ratio of networking and to the perception that the network size exceeds a reasonable limit.

2.3 Opportunity costs of alternative governance modes

The neglect of positive opportunity costs from alternatively available governance modes implies that the analysis lacks a *tertium comparationis*. In order to determine the competitive advantage of an interconnected firm, one has to answer the basic question of "Compared to what?". Arend & Seale (2005) propose several governance modes as potential measures for opportunity costs. In case of a strategic alliance network for example, the opportunity might be regarded as the net gains from an internal venture, which resembles hierarchy. This seems to be an adequate choice for two reasons. First, an internal venture fulfills the requirement of being the most appropriate substitute for alliance networks in terms of comparable strategic ends, risks, and commitments. Second, the net gains from hierarchy are by definition insensi-

tive to variations of network cost determinants, representing a constant opportunity measure over the full range of network activity levels. Constant net gains from internal venturing stem from the fact that the nature of hierarchical transaction and coordination costs is truly different from that of the costs of networking (Kali, 2003).

In network forms of organization, transaction costs arise from interfirm rivalry, and coordination costs are caused by managerial complexity, i.e. efforts to coordinate different autonomous organizations (Park & Ungson, 2001). Hence, the absence of opportunistic appropriation hazards and structural incompatibilities leads to net gains in hierarchical modes which are constant over all levels of network activity (Williamson, 1985). By establishing a meaningful and rather simple benchmark, hierarchy may then serve as a point of reference for determining an alliance network's superiority and the member's competitive advantage.

In the following, we will summarize our ideas on the comparative costs and benefits of networks and hierarchies with a simple heuristic model.

2.4 A simple heuristic model

We assume both the costs and benefits of networks to be a function of the effort devoted to distinct managerial network activities (White & Si-Yun Lui, 2005), in turn being represented by the number of commitments (Lavie, 2006). The gradients and the position of both the benefit and the cost curve are determined by the intermediation environment of the respective industry. The intermediation environment affects the costs and benefits of bilateral link formation between two firms and, therefore, reflects industry characteristics in terms of information asymmetries and uncertainty (Kali, 2003) as well as the basic willingness of potential alliance partners to share resources. We assume the cost function of networks to be u-shaped: $C(e) = a \cdot (e-b)^2 + c$, with c, $b \geq 0$ and $a > 0$, where c denotes the lowest possible cost level corresponding to the activity level e = b. With regard to the gains of networking, we assume the benefit function to be inversely u-shaped: $B(e) = -f \cdot (e-d)^2 + g, \forall\ e \geq 0,$ $B(e) \geq 0$ and to ensure non-negative benefits, $B(e) = 0$ applies for all $e \geq 0$ and $B(e) < 0$ with $f > 0$ and d, $g \geq 0$, where g denotes the maximum level of benefits from networking at the activity level e = d. The net gains from networking can now be compared to the net gains from the use of hierarchy for organizing the same activities: $H(e) = h$ with $h \geq 0$. Figure 1 graphs the comparative costs and benefits for the two governance modes.

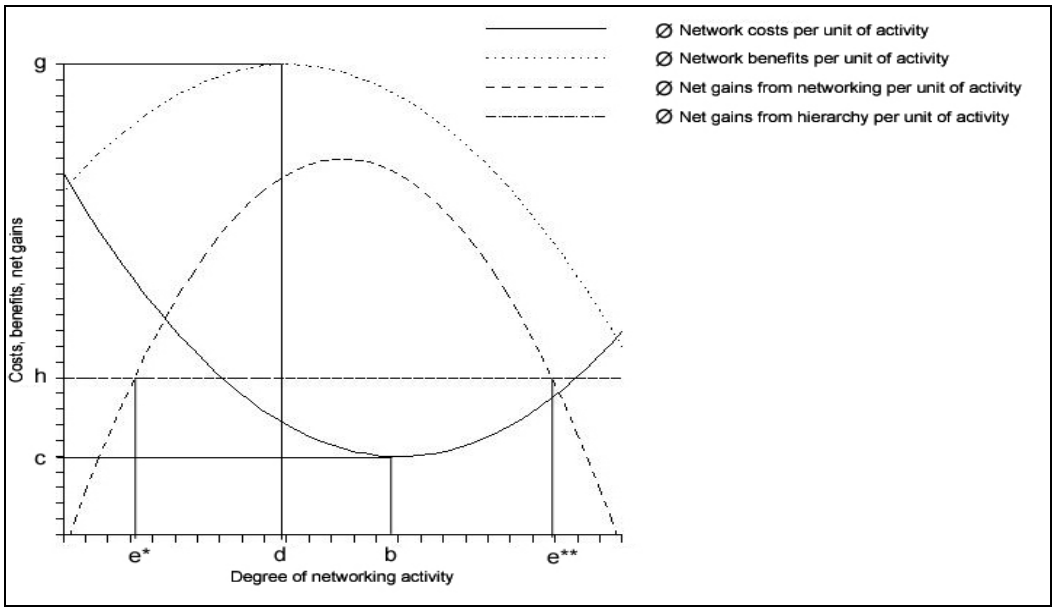

Figure 1: Comparative costs and benefits of networks and hierarchy

For $B(e) - C(e) > H(e)$, which corresponds to activity levels between e* and e**, the potential benefits from networking exceed the costs insofar as they cover the opportunity costs, inducing a competitive advantage for interconnected firms. For $B(e) - C(e) < H(e)$, which corresponds to activity levels lower than e* and higher than e**, interconnected firms are disadvantaged relative to those which use hierarchical governance modes.

The simple heuristic model suggested above emphasizes that economic actors might deliberately choose other organization structures than networking or might also be indifferent between alternative governance modes as a result of a cost-benefit analysis.

3 Empirical tests

3.1 Sample

In the following, we test some of our main ideas on data collected from a sample of franchisees belonging to a German franchise chain. The data were drawn in the context of a broader research project analyzing franchisee satisfaction (see Schlüter, 2001). Our final dataset consisted of 150 observations which represent a fraction of 26% of the system's partners as a whole.

The attractiveness of testing our main propositions on franchising data specifically stems from the fact that franchising not only holds high practical relevance, but also a certain comparability to other cooperative forms of governance, such as strategic alliances. In contrast to other network forms, franchising features unambiguous network boundaries given the under-

lying contractual framework (Shane, 2001). Moreover, with respect to the analysis of network structure, franchising offers a certain consistency in terms of the homogeneity of actors due to franchisor pre-selection of franchisees.

Since we focus on one single chain, our sample is not representative for the whole franchisee population in Germany. However, in terms of validation, tests for non-response biases were conducted, comparing the average parameter-values for age, gender and age of relationship of the sample with that of the population of the chain. The required data were provided by the franchisor. Non-response biases were not observed.

3.2 Hypotheses and variables

3.2.1 Hypotheses

Since we assume a non-linear relationship between networking activity and the costs and benefits of networking, one of our main propositions is that network oversize might imperil network members' competitive advantages derived from external resources. Hence, within the empirical tests, we concentrate our analysis on the range of activity levels behind the threshold of optimal network size.

The following hypotheses summarize our basic ideas with respect to the cost-benefit ratio of networking:

H1: After a certain threshold, and with a growing number of links, it becomes more likely that a firm experiences decreasing cooperation intensity, this fact leading to a decline of the cost-benefit ratio of networking. Franchisees will then perceive that network size exceeds a reasonable limit.

H2: After a certain threshold, and with a growing number of links, it becomes more likely that firms experience increasing opportunism and therefore higher costs of control, this fact leading to a decline of the cost-benefit ratio of networking. Franchisees will then perceive that network size exceeds a reasonable limit.

H3: After a certain threshold, and with a growing number of links, higher valued opportunities lead to a decline of the cost-benefit ratio of networking. Franchisees will then perceive that network size exceeds a reasonable limit.

3.2.2 Dependent variable

Network size exceeds a reasonable limit. To measure whether the network size exceeded a reasonable limit, we deployed a questionnaire item capturing the individual perception of network oversize. Item 0. (table 1) is operationalized using a Likert-type 7-point scale.

3.2.3 Independent variables

Franchisee cooperation intensity. This construct was operationalized using three items referring to the dimensions of cooperation intensity exemplified in chapter 2. Items (1.a -1.c) measured the frequency of interaction, the availability of exchange relations as well as the relevance of interaction with respect to the extent to which business related information was exchanged. It seemed appropriate to use a perceptual measure instead of quantitative data, since the perception of tie intensity provides the basis for the evaluation of benefits received from the network and consequently serves as a reference point for reciprocity-based interaction. Principal component factor analysis confirmed that the items are within one dimension (factor loadings ≥ 0.6). Consequently, an equally weighted component measure was built by averaging the parameter values of the items. A reliability test yielded a Cronbach's alpha of 0.65 which was well above the lower acceptability level of 0.6 (Hair et al., 1998).

Franchisee opportunism. To quantify perceived network partner opportunism franchisees were asked to report whether their partners solely have their own advantage in mind (item 2.).

Opportunity. Within the context of franchising, network membership is defined by the existence of a long-term contractual agreement between the franchisor and the franchisee. Upon payment of an initial fee and royalties, the franchisor provides franchisees with an organization, supply and distribution concept (Sydow, 1993). Moreover, the franchisee acquires the right to participate on all other franchisor and franchisee induced services such as experience conferences or other formal and informal information exchange programs. It is reasonable to assume, that the assessment whether the overall cost-service ratio is balanced or not is anchored to the perceived efficiency and effectiveness of alternative sources of supply, i.e., other governance modes such as markets or hierarchies. Hence, we use the dissatisfaction with the ratio of fee/prices and goods/services (item 3.) as an indicator for the perception of the alternative governance modes' net values.

Table 1. Constructs and measures

Construct	Description of measures	Cronbach's alpha
0. Network exceeded reasonable size	The number of partners has exceeded a reasonable size. (disagree-agree, 7-point scale)	
1. Franchisee cooperation intensity	a I only meet other partners at system-wide meetings and events. (agree-disagree, 7-point scale)	0.65
	b I can ask other franchisees for advice anytime. (disagree-agree, 7-point scale)	
	c I exchange information on business matters with other franchisees on a regular basis. (disagree-agree, 7-point scale)	
2. Franchisee opportunism	Every franchisee primarily has his own advantage in mind. (disagree-agree, 7-point scale)	
3. Opportunity costs	Overall, how satisfied are you with the ratio of fees/prices to goods/services? (satisfied-dissatisfied, 7-point scale)	
4. Franchisee centrality	The number of other franchisees within a 50km-radius.	
5. Franchisor coordination efforts	a My franchisor understands my problems and concerns. (agree-disagree, 7-point scale)	0.59
	b Disputes are not typical for the relationship between me and my franchisor. (agree-disagree, 7-point scale)	
	c My franchisor seeks compromises to accommodate conflicts (agree-disagree, 7-point scale)	

3.2.4 Control variables

We considered further determinants for the perception whether network size exceeds a reasonable limit to strengthen our estimations.

Franchisee centrality. Using two-digit postal codes we computed the number of partners in the area of a 50 kilometer radius (item 4.). Geographical proximity is assumed to facilitate cooperation in that it reduces the costs of information transfer and increases the visibility of reciprocal behaviour. Nevertheless, exceeding the threshold of optimal network size proximity can also lead to opposing effects given that information on non-reciprocal behaviour spreads more easily. In addition, increasing competition on local markets might increase uncertainty with respect to other partners' behaviour, this fact eventually leading to the perception of network oversize.

Franchisee-Franchisor coordination effort. Time and effort devoted to coordination activities for overcoming franchisee-franchisor conflicts is assumed to reduce franchisees' cooperation capacities. Moreover, in implementing communication structures and coordinating franchisees the franchisor influences the system's intermediation environment, given that centralized coordination can reduce coordination costs (Fortune, 2003). Items (5.a-5.c) capture the extent to which high efforts to coordinate between franchisees and the franchisor aggra-

vate the perception of network oversize. Factor analysis confirms that all three items load on a common factor. A compound measure was computed summing up and averaging the parameter values.

Table 2. Factor analysis

2 factors extracted (eigenvalues > 1); KMO: 0.534; Chi2: 163.09 (df=15); significance according to Bartlett's test: $p < 0.001$.					
Factor	Eigenvalue	% of variance	Cum. %		
1	1.839	30.65	30.65		
2	1.774	29.57	60.21		
Item				Factor 1	Factor 2
1.a				0.60	
1.b				0.83	
1.c				0.89	
5.a					0.86
5.b					0.51
5.c					0.86
Extraction method: Principal component factor analysis; rotation method: varimax with Kaiser normalization; values below 0.3 suppressed.					

3.3 Descriptive statistics

Table 3 shows the descriptive statistics on the variables. The average franchisee perceived that network size exceeded a reasonable limit to a moderate extent (mean = 3.56; s.d. = 1.98). Anyhow, with maximum values of 7 and minimum values of 1 the data showed a considerable variance across partners.

Table 3. Descriptive statistics

	Mean	S.D.	0.	1.	2.	3.	4.
0. Network exceeded reasonable size	3.56	1.98					
1. Franchisee cooperation intensity	4.20	1.20	-0.252**				
2. Franchisee opportunism	5.31	1.66	0.262**	-0.305***			
3. Opportunity costs	3.29	1.05	0.145†	-0.004	0.080		
4. Franchisee centrality	4.43	3.65	0.140†	0.088	0.091	0.076	
5. Franchisor coordination effort	3.20	1.10	0.325***	-0.060	0.206*	-0.287***	-0.108
N varies between 123 and 150; significance levels (2-tailed): *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; † $p < 0.1$.							

The independent variables showed the following parameter-values. First, the average franchisee perceived moderate to high values of cooperation intensity (mean = 4.20). This reflects a positive attitude towards the perception of cooperation. Second, the mean value of franchisee opportunism is 5.31. This suggests that the average franchisee observes quite a

strong focus on individual rather than collective advantages. Third, the data showed a slightly positive perception of the ratio of fees/prices and goods/services (mean = 3.29). Nevertheless, a value range of 1-7 reflects the existence of rather satisfied as well as unsatisfied partners. Fourth, the average franchisee counts 4.43 partners within a radius of 50 km (min = 0; max = 15). Fifth, the mean of franchisor coordination effort is 3.20 which points to quite efficient franchisor-franchisee relations.

3.3 Regression results

Table 3 shows the results of bivariate correlations, indicating tentative support for hypotheses H1-H3. To test whether these results are stable while controlling for network position and environmental factors, we employed ordinary least squares regression. The examination of variance inflation factors and condition indices indicate that the assumption of non-multicollinearity is not violated (Hair et al., 1998). Further tests reveal that the assumptions of normally distributed random errors and homoscedasticity were met.

Table 4. Regression results

Method: OLS	
constant	2.190† (1.156)
Franchisee cooperation intensity	-0.382* (0.149)
Franchisee opportunism	0.226* (0.111)
Opportunity costs	-0.005 (0.160)
Franchisee centrality	0.087† (0.045)
Franchisor coordination effort	0.445** (0.156)
n	116
F	6.225***
Adjusted R^2	0.184

Dependent variable: Network exceeded reasonable size. Standard errors in parentheses.
Significance levels (2-tailed):
*** p < 0.01; ** p < 0.01; * p < 0.05; †p < 0.1.

The overall model regressing the perception of network oversize on cooperation intensity, opportunism, opportunity costs, franchisee-franchisor coordination effort and franchisee centrality was highly significant. Our estimation accounts for 18.4% of variance within the data.

Table 4 shows the regression results. Franchisee cooperation intensity yielded a coefficient of -0.382 ($p < 0.05$), supporting hypothesis 1 which postulated a negative relationship between the perception of cooperation intensity and the perception of network oversize. Supporting hypothesis 2, the coefficient of franchisee opportunism (0.226; $p < 0.05$) confirms the positive relationship between perceived partner opportunism and perceived network oversize, indicating that higher costs of control affect the cost-benefit ratio of networking. Although the dependent variable was positively correlated to the opportunity costs of networking, the results do not confirm hypothesis 3. Surprisingly, the coefficient is weakly negative, but not significant. Franchisee centrality and franchisee-franchisor coordination effort were both significant.

4. Summary and conclusion

Our theoretical analysis as well as the empirical example indicates that there is no linear additive relationship between the connectedness of a firm and the value effects of additional external resources. In conclusion, this note seeks to encourage a more general approach to network analysis, allowing for opportunity costs of alternatively available forms of governance and non-linearities to affect the value of additional shared and non-shared resources. It follows from this perspective that differences in rent generation may not only be driven by firm- and relation-specific factors, but also by network activity itself. In particular, high activity levels of networking imply declining benefits due to inefficiencies in information flows and scarce management capacity which – in conjunction with restricted tie breaking capabilities – might hinder intensive exploitation of connections. Furthermore, when exceeding a certain threshold of network size, the costs of networking rise exponentially due to increasing costs resulting from control and coordination efforts.

Dyer, Kale and Singh (2001) report that 49% of alliances did not have established any kind of metric to measure network performance. Hence, network management is still dictated by heuristics and rules of thumb rather than anticipative management based on hard facts. Considering potential constraints and dysfunctionalities of networking, firms are in the danger of not recognizing rising costs from network extension which might result in a competitive disadvantage of the interconnected firm.

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