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Social networks and organizational similarity: an analysis of similarities in chairperson remuneration among Sweden's publicly traded firms

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Abstract

This article argues that information about different social networks can supplement more economically based explanations of organizational conduct, thus yielding more precise predictions about organizational behavior. This study finds that firms tend to remunerate their chairpersons more similarly when the firms are part of the same social network. Furthermore, the results show consistently that multiple networks operate as channels of social influence that affect organizational behavior. The implication of the findings is that social embeddedness is a factor that has to be taken seriously in any attempt at explaining the rationale for a firm's conduct in a group of firms belonging to the same system.

1. Introduction

In the quest for a better understanding of organizational behavior and decision-making, current research has increasingly come to emphasize the importance of a firm's social embeddedness (Granovetter, 1985; Pfeffer, 1987; Mizruchi & Schwartz, 1987; DiMaggio & Zukin, 1990; Uzzi, 1996). One of the reasons for this emphasis is simply that many of the firms' top decision-makers "know one another, see one

another socially and at business, and so, in making decisions, take one another into account" (Mills, 1956). Any type of interaction between the firms' top executives, formal or informal, implies a potential for sharing important information that can produce similarity in organizational behavior and decision-making (Homans, 1961). This article explores the consequences of this information potential in greater detail.

To assess how this information exchange can lead to similarity in organizational behavior, I draw on earlier work that explored social influence among individuals (see Brown, 1988). This provides me with a plausible mechanism for explaining how decision-makers' interpersonal relations can influence their decision-making concerning their firms.

The explicit decision I focus on is the level of remuneration to chairpersons in publicly traded firms, and how firm characteristics and social interaction between the firms' executives influence this decision. My working hypothesis is that the remuneration pattern of two firms will be more similar if they also share other organizational characteristics and if the two firms' decision-makers belong to the same social network.

Social networks among the investigated firms are crucial to this analysis. While it is difficult to account for all possible social networks linking the firms, it is essential to recognize the probability of multiple networks and, when possible, to assess their relative importance for the behavior being studied (Hedström, 1994; Brown, 1981). I will account for social influence in networks derived from information on board interlocks, geographical proximity, competitive relations, and list affiliation on the Stockholm Stock Exchange.

The structure of the article is as follows. First, I give a brief account of current research on organizational embeddedness. This is followed by a theoretical presentation of the mechanisms of organizational similarity, followed by my hypotheses, which I test empirically. The empirical analysis relies on data that combine information from annual reports with information on network attributes for all publicly traded firms in Sweden. The method I use is the so-called dyadic approach, which focuses on the observed similarity between pairs of observations. Thus, the unit of analysis is the dyads created by pairing each firm with all the other firms in the population.

2. Background

When Granovetter (1985) explained in his paper on organizational social embeddedness "that the behavior and institutions to be analyzed are so constrained by ongoing social relations that to construe them as independent is a grievous misunderstanding (p. 482)", he clarified the need for sociological applications that supplement traditional economical explanations of organizational behavior (Uzzi, 1996).

However, organization sociologists' contribution to our understanding of organizational social embeddedness is more about the origins than about the consequences of this embeddedness. The now large number of studies of corporate elites, which are dominated by resource dependence, social class, and institutional perspectives, are all illustrative of such explanations (Edward & Westphal, 1996; Gulati, 1995; DiMaggio

& Powell, 1991; Pfeffer, 1987; Burt, 1980; Mintz & Schwartz, 1985; Stockman, Ziegler, & Scott, 1985; Useem, 1980; Pfeffer & Salancik, 1978; Mariolis, 1975).

Other organization sociologists, in line with mainstream economists, tend to regard the effects of social structure as marginal, and explain decision-making about such things as compensation levels in terms of firm characteristics such as size, industry, and the gender composition of employees, rather than of interdependencies of social origin (Le Grand, Szulkin, & Tåhlin, 1994, 1995; Kalleberg, 1994; Blau, 1970).

Although the latter type of explanation of compensation levels is often informative, and in many cases sufficient, failure to consider alternative explanations such as the influence of a firm's social embeddedness may lead to erroneous conclusions (O'Reilly III, Main & Crystal, 1988), especially if the analysis focuses on similarities between firms as mine does here.

With regard to the former set of explanations, while it is crucial to study the origins of organizational social embeddedness, it is equally important to assess the consequences of these relationships, otherwise we run the risk of providing explanations for relationships that have no bearing on organizational behavior. Though rapidly increasing, such research is still rather uncommon. For example, Uzzi (1996) has shown that firms that are highly embedded in a network consisting of other firms have a higher potential for survival. Davis (1991) found that firms were more apt to adopt a "poison pill" approach to hostile corporate takeovers if they interlocked with firms that had already adopted such a strategy. Wade, O'Reilly III and Chandratat (1990) found an association between certain interlocks and the existence of "golden parachute" policies. Mizruchi (1989) showed that campaign contributions to political action committees (PACs) dedicated to business interests coincided with interlocking patterns.

3. Economic determinants and organizational similarity

Management compensation across firms is known to vary as a function of firm size, firm performance, and human capital factors like education, seniority, experience, among others (Tilly & Tilly, 1994; Westphal & Zajac, 1994; Meyersson, 1994; Boxman, De Graaf & Flap, 1991; O'Reilly III et al., 1988).

The usual explanation why firm size determines compensation level is that managing large firms is more complex and subject to more responsibility than managing small firms, which justifies higher compensation in large firms (O'Reilly III et al., 1988). The importance of firm size for management compensation in Swedish firms has been demonstrated (see Meyersson, 1994).

One reason why firm performance is likely to be a determinant of management compensation is simply that management is directly responsible for the performance of the company. Hence, we would expect a positive relation between a firm's performance and its level of management compensation (Fama & Jensen, 1986). However, empirical studies of this eloquent economic theory have not been able to demonstrate a consistent relationship between a firm's performance and its compensation level (Westphal & Zajac, 1994). One of the possible reasons for this apparent discrepancy

could be related to the agency problem. For example, firms with dispersed ownership may have less owner control, which might result in higher compensation levels since the directors will assess the compensation under less pressure and with less interference from the investors (see Shleifer & Vishny, 1995) for a more extensive discussion of the agency problem). Under such circumstances it is not unlikely that the level of compensation will reflect the directors' personal interest rather than the owners', regardless of the firm's performance.

Finally, human capital factors have been linked to several measures of compensation. However, the direction of this relationship is not altogether clear. Some argue that greater job skill and experience are positively related to personal compensation (see O'Reilly III et al., 1988). Others maintain that a manager's influence over the compensation committee increases with time (Westphal & Zajac, 1994). A third argument states that contracting new managers in other firms calls for high compensation in order to hiring managers away from other firms (Gomez-Meija, Tosi, & Hinkin, 1987). This last theory implies a negative relationship between the directors' tenure and their compensation, while the others imply a positive relationship.

How do these factors influence the *similarity* between the remuneration levels of two firms? Ideally, we would expect any pair of firms with equivalent scores on these firm-specific variables to compensate at an equivalent rate as well. However, this does not seem likely, particularly if we try to assess management compensation in the way I do here. A more likely conjecture is that knowledge about a firm's characteristics takes us part of the way towards predicting compensation levels. The reason for this is that the firm's characteristics merely provide us with information about a firm's predisposition when making this decision, and not about how they arrive at their decisions. Making decisions about compensation levels almost certainly involves other factors besides the firm's characteristics just described.

4. Social influence and organizational similarity

In the context of this study, it seems reasonable to expect, besides the standard economic determinants, some variation in firms' compensation levels due to (1) the economic benefits the compensated director can bring to the firm in the future, (2) the "going rate" for the category of employee to be compensated as well as for the specific candidate and, most importantly, (3) the decision-makers' personal beliefs regarding the appropriate level of compensation in relation to the standard economic determinants in conjunction with the level of future benefits and the going rates of director compensation.

Future benefits and going rate represent imprecise scales of judgment (March, 1984). We know from past research that a decision-maker often asks around about the actions and opinions of others, when facing ambiguous organizational decisions (Cyert & March, 1963). For practical purposes, this decision heuristic is usually practiced on people included in the subject's social network (e.g. Coleman, Katz, & Menzel, 1966; Granovetter, 1978; Burt, 1987; Sandell & Stern, 1998). The reason for this is that an individual gets the most reliable information from his/her social

network (Merton, 1968; Boudon, 1986; Brown, 1988), and that the personal network may be the only source of information for forming a well-considered decision in uncertain, novel, or otherwise ambiguous choice situations (e.g. Sherif, 1936; Hedstöm, 1994; Sandell, 1999).

The decision-maker's social network is also likely to be important for the formation of his/her personal beliefs about the size of the appropriate compensation. Festinger (1954) has suggested that one of the wider functions of consulting others is that it provides a tool for the constant assessment and evaluation of the correctness of the beliefs that guide behavior.[1] People do not necessarily consult others who are similar in a general way, but rather those who are similar in terms of attributes related to the belief in question (Brown, 1988). Thus, because less experiential information can be gained from asking people lower in the organizational hierarchy or of lesser competence, directors will prefer to ask someone in a similar position to themselves about such things as compensation.

So far, the implicit assumption has been that social influence is exerted directly through "face to face" interaction. However, Marsden and Friedkin (1993) have pointed out that social influence of the type discussed here does not require direct interaction. The only precondition, they say, is that an observer can spontaneously pick up information about another actor's behavior, and imitate it.[2]

However, the reasons why actors imitate others have rarely been sufficiently analyzed in the sociological literature (see Hedström, 1998). The analysis has either assumed that imitation is purely a reaction without any meaningful orientation toward the actor being imitated, or that actors are conformists with an overarching desire to be and to act like others (Sandell, 1998, p. 75).

Neither of these hypotheses seems to offer a likely explanation as to why one firm should follow the lead of another firm. A much more plausible explanation is that imitation is an effective way of obtaining normative guidance for beliefs or actions that might otherwise have to be evaluated by trial and error (Marsden & Friedkin, 1993). For example, Burt (1987) has argued that this is a likely strategy among competitors. Thus, just as the directors find it useful to consult other directors directly on ambiguous questions such as compensation, they will probably find it equally useful to look around at the actions of other directors.[3]

There is a strong and obvious resemblance between the logic behind the tendency of firms to imitate other firms, and the logic in Festinger's theory of social comparison. Hence, despite the conceptual differences between direct and indirect interactions, I will maintain that this is merely a question of semantics, and that it is only the

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[1] This is obviously not an act that is objectively rational in the narrow sense described by Elster (1983). To assess the correctness of one's beliefs by reference to the beliefs of others is always hazardous, since the others' beliefs may be false, and hence misleading. A better description would be to label the behavior as cognitively rational (Boudon, 1994). While such behavior is not scientifically guided, it is probably one of the most common ways in which individuals arrive at decisions.

[2] See also DiMaggio and Powell (1991) on mimetic isomorphism.

[3] Robert Cialdini (1984) refers to this as "the principle of social proof": When in doubt about the correct way, always look around at the actions of others for possible clues.

method used in making the comparison that separates the two: observation in the latter case and verbal communication in the former.

5. Social networks and organizational similarity

Before I embark on my empirical analysis it could be helpful to expound on the types of social ties or networks that may serve to carry the type of information I have discussed above.

The first concern is that the networks should include the right people, that is, that they include the decision-makers who decide on the matter under consideration, which in this case is chairperson remuneration. The following citations from the annual reports of some Swedish firms demonstrate that the relevant decision-makers are the board members:[4]

- At the annual meeting of shareholders it was decided that the remuneration to the Board should consist of a fixed amount of SEK X. The Board has decided to distribute the remuneration in question in such way that the Chairperson receives Y percent and the other members receive Z percent each.
- A remuneration of SEK X has been issued to the Chairperson for the year, which has been fixed by the Board within the limits of the amount of Board remuneration prescribed by the annual meeting of shareholders.
- According to the decision reached at the annual meeting of shareholders, remuneration to the Board shall consist of a fixed amount of SEK X, to be distributed according to the Board's decision.

Since board members are known to be eligible to sit on more than one board, it is reasonable to expect that board interlocks between firms provide valuable information about how others remunerate their chairpersons. Second, as suggested by Festinger (1954) and Brown (1988), people evaluate their own beliefs by comparing them with those of others. Hence, apart from providing information about the actions of others, board interlocks also provide decision-makers with a means for evaluating and comparing their beliefs about appropriate compensation with those of others. Once they have invoked the information potential from the board interlock, they can modify their opinions. This action is likely to result in greater congruence in the parties' beliefs about the size of a chairperson's remuneration (Homans, 1961). Furthermore, it seems reasonable to expect that the similarity between two firms will be greater, the more direct interaction there is between their board members.

Inasmuch as directors from the same area do not rely on boardroom participation for their contact with each other (Palmer, Friedland, & Singh, 1986), it is likely that the interlock only captures part of the contact potential between directors (Davis & Greve, 1997). I therefore form another network based on the physical location of the firms' headquarters.

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[4] Author's translations. I have deliberately left out numbers and names. I would also like to point out that these are just examples, and that most of the annual reports contain similar wordings.

As I mentioned above, "observe and imitate" is a likely strategy among competitors (see Burt, 1987). In order to take this into account, I include a third network based on the firms' industry affiliations.

Since the population of publicly traded firms in Sweden is fairly small (around 200 firms), it is possible that a firm will identify with other firms apart from their competitors. That is, instead of looking at competitors for clues about what is appropriate, decision-makers may look at the way other publicly traded firms go about solving their compensation issues. Since there are three main listings on the Stockholm Stock Exchange, the A-list (or primary list), the OTC-list, and the O-list, I introduce a fourth network based on the firms' list affiliation.[5]

In the light of the above theoretical discussion of the origins of organizational similarity, I will address two major questions in the following empirical analysis: (1) To what extent does similarity in chairperson remuneration in two firms depend on the firms' similarity in terms of economic determinants? (2) To what extent does similarity in chairperson remuneration in two firms depend on the firms' social embeddedness in the four dimensions just described? That is, I will explore the extent to which the presence of a board interlock between two firms, the geographical location of the two firms, their industry affiliation, and their list affiliation make the firms more similar with respect to the way they remunerate their chairpersons.

6. Data measures and method

The initial sample included all the (195) firms that were listed on the Stockholm Stock Exchange at the end of 1994 and 1995.[6] I excluded firms with a working chairperson who was entitled to a "salary" instead of remuneration as well as firms that failed to render a comparable account of issued remuneration in their annual reports. This yielded a final sample of 159 firms. For these 159 firms, I recorded relevant information from their annual reports. Besides annual report data, I had network data for all the initial 195 organizations. While I did not include the eliminated firms mentioned above in the analysis, I computed measures of network connectivity, when appropriate, using information from all the 195 organizations.

6.1. Dependent measure

Information on remuneration to chairpersons came from the firms' annual reports. In Sweden, the Trade and Industries Stock-Exchange Committee (Näringslivets Börskommitee) recommends that publicly traded firms provide a separate accounting of chairpersons' and CEOs' earnings in their annual reports. While this is only a recommendation, most firms follow it. In some firms, however, it is not always

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[5] The length of the firm's verifiable history and the dispersion of its stock constitute the difference in listing (see Stockholm Stock Exchange's Web site for further details: http://www.xsse.se/).

[6] I used this criterion only to ensure independent measures from the year before the dependent measure.

possible to distinguish the chairperson's remuneration from that of the other board members. Other types of compensation that chairpersons enjoy may also cloud the picture. Hence, I have only recorded remuneration in those cases where the annual report mentions the chairperson's remuneration explicitly.

Since the intention of this study is to investigate the similarity between chairperson remuneration in firm pairs, I first transform the independent measures of the two firms into a joint measure of similarity. The most straightforward way to measure the extent of similarity between pairs of firms is to employ a measure of absolute differences. Accordingly, I represent similarity between two firms with the following measure:

$$S_{ij} = \sqrt{(y_i - y_j)^2}, \tag{1}$$

where S_{ij} equals similarity in remuneration between organization i and j, and y_i and y_j equal the remuneration issued in organization i and j, respectively. Finally, in order to facilitate interpretation of the results, I reverse the sign of this measure so that a high level of similarity corresponds to high values of S_{ij}.

6.2. Organization characteristics

I measure firm size in two ways: number of employees, and assets (in million SEK). A firm's performance is measured in terms of profitability, which I define as return on equity in 1994. I collected information about the number of employees, assets, and profitability from the firms' annual reports. I also include information about the firms' market value in 1994 (in million SEK) as a combined size–profit measure. To control for the "agency problem", I include a measure of ownership concentration, where dispersed ownership implies less owner control. To account for the effects of human capital factors, I include two measures: the age of the chairpersons, and their time as board member of their respective firms. Data on market value, owner concentration, and the age of the chairpersons were collected from *Sundin and Sundquist's Owners and Power in Sweden's Listed Companies* (1995), and the information about the chairperson's tenure came from the firms' annual reports.

As in the case of the dependent measure, I transform all of these independent measures of two organizations' characteristics into a joint measure of similarity by using the same procedure as I used for the dependent measure above.

6.3. Relational measures

I derived interlock network data from a list of board members as reported in Sundin and Sundquist's *Owners and Power in Sweden's Listed Companies* (1995, 1996). I disregarded board members such as deputy members, accountants, deputy accountants, and staff representatives to avoid the inclusion of redundant ties in the final analysis. Furthermore, I also excluded the chairpersons themselves for obvious reasons. I used a dummy variable to represent the board interlock network that takes the value 1 (one) whenever two organizations share a board member, and 0 (zero) otherwise.

I measured geographic proximity by using information on the regional location of the firms' headquarters. (Sweden is divided into 25 regions.) Accordingly, I computed a dummy variable that took the value 1 (one) whenever two firms' headquarters were located in the same region of Sweden.

To indicate whether two organizations have a competitive relationship, I used the organization's industry code, which is a five-digit number that follows an international standard. To use information about all five digits is likely to cause the exclusion of possibly influential industries. I therefore defined a dummy variable that measures a competitive relationship to be 1 (one) if two organizations shared the same first digit in their activity code, and 0 (zero) otherwise. While this rough definition is likely to include less influential industries in the influential category, it is unlikely to miss substantial influences (Davis & Greve, 1997). I extracted data for the attributes denoting competitive relations and geographic proximity from the *Swedish Commerce and Industry Yearbook* (*Svenska Handelskalendern*).

Finally, based on the information from the Stockholm Stock Exchange about a firm's current listing, I computed a dummy variable that takes the value 1 (one) whenever two firms are on the same list on the Stockholm Stock Exchange.

6.4. Model

To explore the extent of the similarities that result from a homogeneity of network elements, I employ the dyadic approach. This approach consists of the specification of a linear model that relates the dependent measure of similarity of pairs of firms to the independent measures of similarities defined above. However, because I include each organization in multiple dyads,[7] traditional OLS estimates are rendered biased. Two frequently used ways of dealing with this problem are to use a least-squares dummy-variable regression (LSDV) or a random effect model regression (Mizruchi, 1989; Gulati & Gargiulo, 1996). I prefer the random effect model because it corrects for the problem of dependent observations with a randomly drawn probability distribution rather than relying on the sample, as the LSDV technique does. Thus, the random effect model allows one to make better generalizations. To be on the safe side, I checked whether the results were sensitive to model choice; as it turned out, there were no significant differences between the two models. The model is the following:

$$S_{ijt} = \alpha + \sum \beta_k Z_{kijt-1} + \sum \gamma_k X_{kijt-1} + v_i + \varepsilon_{ij}, \tag{2}$$

where S_{ij} is the similarity in chairperson remuneration as defined in Eq. (1) between firms i and j, Z_{kij} is the k variables describing the relationships between firms i and j, X_{kij} is the k measures of similarities in firm-specific characteristics, β_k and γ_k are regression coefficients, and v_i is the unit-specific residual. It differs between i's, but for any particular i, its value is constant. ε_{ij} is the ordinary residual with the usual properties.[8]

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[7] With N organizations there are $(N^2 - N)/2$ dyads, which in this case implies: $(159^2 - 159)/2 = 12,561$ dyads.

[8] See StataCorp (1997) for a more mathematical account of the random effect model.

7. Results

I will report the results in five models (see Table 1). In Model 1, I analyze similarity in chairperson remuneration as a function of similarities in firm characteristics. In Model 2, I introduce my network measures. In Model 3, I add a measure controlling for the alternative hypothesis that any observed similarity between two firms is the result of two firms facing the same market price for chairpersons. Finally, in Models 4 and 5, I examine the nature of the observed network effects in more detail.

Model 1 (see Table 1) shows the effect of the independent measures of similarity in organization characteristics. The results reveal that similarity in remuneration is strongly correlated with similarity in firm size, indexed by "number of employees" and total "assets". These results thus agree with my hypothesis based on the suggestive findings of prior research that size is important when explaining the firms' compensation levels (Meyersson, 1994; O'Reilly III et al., 1988).

My second hypothesis concerns firm performance. As the result in Model 1 shows, similarity in both profitability and market value is strongly associated with the firms' similarity in remuneration. The fact that "market value" and "profitability" are significant supports the notion of performance-related compensation (Fama & Jensen, 1986). However, since "market value" can be considered a compound of both size and revenue, it simultaneously strengthens the argument about a relationship between firm size and management compensation.

The presence of a positive relationship between firm performance and compensation in this study implies that alternative explanations, such as the agency problem discussed above, should be of minor influence. The weak negative effect of "owner concentration" in Model 1, and the negative and insignificant effect of this measure in Models 2–5 confirm this notion.

Finally, Model 1 also explores the hypothesis regarding the relationship between remuneration and human capital factors. Of the two similarity measures, "chairperson's age" and "chairperson's tenure", only similarity in age contributes significantly to the model. These results suggest that the level of remuneration is a function of factors related to life experience rather than factors related to on-the-job experience or increased power over the compensation committee (Westphal & Zajac, 1994).

One of the characteristics of the dyadic approach is that it is not possible to comment on the direction of the underlying relationships in Model 1. All that can be inferred is that firms that are similar in terms of the independent measures are also similar in terms of the dependent measure. In order to achieve a more precise interpretation of the results in Model 1 (Table 1), I correlate each firm's remuneration level with its organizational characteristics (see Table 2).

The correlation coefficients in Table 2 reveal a positive relationship between the firm size measure "No. of employees", and the size of the chairperson's remuneration. With some caution, it is thus possible to infer that the regression estimate for "No. of employees" in Model 1, Table 1, implies that two firms with few employees compensate at a lower and equivalent rate, and that two firms with many employees remunerate at a higher and equivalent rate. The same interpretation applies to all the significant similarity measures in Table 1, Model 1.

Table 1
Generalized least-squares regressions predicting the similarity in chairperson remuneration (Z-values in parentheses)

Similarity in	Model 1	Model 2	Model 3	Model 4	Model 5
No. of employees	2.994	3.072	3.017	3.025	3.023
	(26.821)[a]	(27.758)[a]	(27.385)[a]	(27.434)[a]	(27.464)[a]
Assets	0.001	0.001	0.001	0.001	0.001
	(18.163)[a]	(17.031)[a]	(15.378)[a]	(15.279)[a]	(15.188)[a]
Profitability	16,109.620	17,215.200	15,319.340	15,416.470	15,494.910
	(6.602)[a]	(7.093)[a]	(6.333)[a]	(6.373)[a]	(6.412)[a]
Market value	2.258	2.302	2.261	2.266	2.267
	(21.060)[a]	(21.670)[a]	(21.388)[a]	(21.417)[a]	(21.458)[a]
Owner concentration	− 151.504	− 120.713	− 104.850	− 105.777	− 108.946
	− (1.995)[b]	− (1.604)	− (1.401)	− (1.413)	− (1.457)
Chairperson's age	508.388	464.539[a]	466.117	466.715 [a]	451.088
	(4.027)[a]	(3.715)	(3.748)[a]	(3.753)	(3.630)[a]
Chairperson's tenure	10.299	− 55.318	− 91.892	− 94.399	− 85.853
	(0.116)	− (0.627)	− (1.047)	− (1.075)	− (0.979)
Board interlock		29,945.530	25,715.210		26,151.230
		(6.328)[a]	(5.449)[a]		(5.546)[a]
Geographical location		− 2518.322	− 1730.495	− 1824.801	− 1689.010
		− (1.294)	− (0.893)	− (0.942)	− (0.873)
Industrial belonging		276.179	− 568.389	− 406.523	− 627.408
		(0.102)	− (0.210)	− (0.150)	− (0.232)
Stock exchange listing		21,109.970	13,738.570	13,640.960	12,850.370
		(14.015)[a]	(8.475)[a]	(8.400)[a]	(7.890)[a]
CEO compensation ranking			243.216	239.521	240.844
			(11.890)[a]	(11.614)[a]	(11.783)[a]
Indirect board interlock				2680.025	
				(0.993)	
Direct board interlock				6596.966	
				(0.619)	
Direct and indirect board interlock				30,901.960	
				(5.871)[a]	
Board interlock × stock exchange listing					54,328.110
					(5.104)[a]
Intercept	− 66,232.100	− 75,614.550	− 61,441.440	− 61,786.550	− 61,331.690
	− (9.246)[a]	− (10.527)[a]	− (8.425)[a]	− (8.454)[a]	− (8.408)[a]
Wald Chi-2	3700	4022	4205	4211	4239
Degrees of freedom	7	11	12	14	13
No. of firms	159	159	159	159	159
No. of dyads	12,561	12,561	12,561	12,561	12,561

[a] Significant at less than the 0.01 level.
[b] Significant at less than the 0.05 level.

Table 2
Correlation coefficients for remuneration and organizational characteristics ($N = 159$)

Variable	1	2	3	4	5	6	7	8
1. Remuneration	1.00							
2. No. of employees	0.65	1.00						
3. Assets	0.53	0.26	1.00					
4. Profitability	0.07	0.10	− 0.02	1.00				
5. Market value	0.63	0.64	0.33	0.11	1.00			
6. Owner concentration	− 0.19	0.05	− 0.24	0.12	− 0.06	1.00		
7. Chairperson's age	0.11	0.07	0.13	0.08	0.11	− 0.06	1.00	
8. Chairperson's tenure	0.06	0.09	0.18	0.13	0.08	0.09	0.28	1.00

In Model 2 (Table 1), I introduce the measures of my hypothesized network effects. The results are clear-cut. Firms that interlock and/or that are traded on the same list at the Stockholm Stock Exchange show a significant tendency to compensate chairpersons at a similar level, while the effect of regional and industrial proximity is negligible. Hence, it appears that the firms' remuneration policy is influenced both by the decision-makers' ability to communicate directly (Festinger, 1954), and their observation and imitation of others (Marsden & Friedkin, 1993).

The absence of similarity due to regional and industrial proximity is surprising, however. The influence of geographical and industrial proximity is well known (Marsden & Friedkin, 1993; Davis & Greve, 1997) and typically confirmed in studies of this type. One plausible explanation of the lesser importance of geographical proximity here is the disproportional geographical distribution — more than 3/4 of the publicly traded firms in Sweden operate in the Stockholm area. As far as the absence of effect due to industrial proximity is concerned, the explanation must be more speculative. One possibility is that when in doubt about what to do, publicly traded firms look at the actions of other publicly traded firms in general, rather than at the actions of others in the same industrial segment. The strongly significant estimate for the "stock exchange listing" measure supports this notion, and at the same time it informs us that firms do not compare themselves with publicly traded firms in general, but with firms traded on the same stock exchange list.[9]

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[9] A condition for substituting the industrial categorization for the wider concept "publicly traded firms" in this way is that the population of publicly traded firms has to be small enough to make a comparison across all firms feasible. In this case the number of publicly traded firms is just short of 200, which by most standards has to be considered quite small. In a larger economy such as the United States, a comparison with publicly traded firms in general becomes untenable and not very informative. Thus, we would expect that in a different context, industrial origin is a more useful guide to firm conduct. More precisely, the Stockholm Stock Exchange's primary list contains about 100 firms, the OTC-list and the O-list about 45 firms each.

To control for the possibility that any observed similarity in chairperson remuneration is simply the result of two firms facing the same market price for chairpersons, I include a market-based measure in Model 3. The measure I use is the similarity between two firms' ranking in terms of the size of CEO compensation.[10] As shown in Model 3, this measure is highly significant, and thus, it cannot be excluded that chairperson remuneration is a function of other market mechanisms than those emerging from my network measures. The inclusion of the market measure slightly diminishes the effect of my two significant network measures, but, as shown in Model 3, these are still strongly significant after the market-based control measure has been introduced.

As I suggested above, the more interactions there are between two firms' decision-makers the more similar would we expect the firms to be (see Homans, 1961). Ideally, we would like to have detailed information about interaction frequencies between the firms' decision-makers to test this hypothesis. Since I am not aware of any data set that contains network information of such detail for these firms, I have adopted an alternative approach to test this hypothesis.

A simple way of differentiating the contact frequencies of two firms is by including information about indirect interlocks, that is, whether organizations i and j independently share a board member with organization k.[11] For reasons of consistency we would expect firms with both direct and indirect interlocks to be more similar than firms with only direct or indirect interlocks, and firms with only direct interlocks to be more similar than firms with only indirect interlocks. Thus in Model 4, I include a set of dummy variables indicating the four following states: whether two firms enjoy both direct and indirect interlocks, direct but no indirect interlocks, indirect but no direct interlocks, and finally if they have no interlocks at all. This last category is my reference category.

One way to interpret these dummy variables is to regard them as indications of interaction intensity. Ceteris paribus, two firms that do not interlock either directly or indirectly tend to have an average difference in remuneration of SEK 30,901 more than firms that have the highest interaction intensity, that is, both direct and indirect interlocks (see Model 4). Although the two remaining dummy variables are non-significant, judging by the increment in the parameter estimates when the estimate for the dummy indicating low is compared with medium and high interaction intensity, it appears that similarity in remuneration increases with the intensity of the directors' interactions.

In Model 2, we saw that similarity depended on both direct communication and observation. Since it is not unlikely that any observed similarity is the result of the interplay between communication and observation, I also add an interaction effect

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[10] The reason for using information about CEO compensation instead of chairperson remuneration is that using the latter would imply that remuneration appears on both sides of the regression equation. The justification for using CEO compensation is that it is unlikely that the firms would face two different markets when compensating these two categories of top executives.

[11] From the directors' perspective, such ties permit social influence to operate between board members in organizations i and j while meeting in organization k (Johnsen & Mintz, 1989).

measure controlling for this dimension (see Model 5).[12] As the results in Model 5 indicate, the interaction measure is highly significant, which means that not only does similarity between the studied firms depend on their interlocks and their list affiliation independently, but that the magnitude of the effect of these variables varies in terms of their respective values. For example, holding the other effects constant, firms that interlock and are on the same list have an average *difference* in remuneration of SEK 54,328 *less* than firms that share only one of these dimensions.

8. Conclusions

The main argument of this paper has been that sociological explanations can supplement economic explanations in a way that enhances our understanding of organizational behavior. However, it is far from clear when or if such explanations are appropriate, or which types of organizational behavior may be particularly affected by social interdependencies. Another concern is that the mechanism causing social influence among organizations is often unclear; nor is it clear what type — or types — of network may operate as a channel for social influence. In this article I have provided a mechanism that triggers social influence among organizations as well as an assessment of the relative importance of multiple social networks for the channeling of this influence.

The results demonstrate that the behavior of Sweden's publicly traded firms is indeed a consequence of their firm characteristics in combination with their social embeddedness. Not surprisingly, the by far most important variables of firm characteristics are the measures of firm size, followed by the profitability measures. Of less importance are my measures related to the chairpersons' experience. Two of the four hypothesized network effects turn out to be significant — board interlocks and list affiliation. In this study, contrary to prior research findings, the effects of geographical proximity and industrial proximity are negligible and non-significant. I argue that this somewhat surprising finding is a result of contextual effects such as the relatively small size of the Swedish economy and stock market.

I also make a distinction between social influence through communication and through observation. The significant effect reported for board interlock and the list affiliation demonstrates that both observation and direct communication are important channels of social influence among the organizations.

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[12] The correlation between the board interlock measure and the interaction measure was 0.85, while it was only 0.15 for list affiliation. A correlation coefficient as high as 0.85 is a very strong indication that autocorrelation is present in the model causing inefficient estimates and biased standard errors for my interlock measure when it is introduced together with the interaction measure. To correct for this problem, substitute the original interaction measure for the residuals obtained by regressing the measure of direct interlocks on the original interaction measure (direct interlock × stock exchange listing). The only difference introduced by this measure is that the interlock variable's coefficient estimate is no longer biased; the estimates for the variable list affiliation as well as for the interaction effect are exactly the same as they are when the original interaction effect measure is used.

In relation to my discussion about the effect of direct communication, I suggest that increased similarity should follow from increased contact intensity in terms of interlocking. The results support this hypothesis, which obviously strengthens the paper's theoretical argument, namely that directors' decisions are influenced by social comparison. I also argue that it is unlikely that communication and observation are isolated channels of influence. A more likely assumption is that they are intertwined, and that influences stemming from direct communication, for example, may be reinforced when confirmed by observation. The interaction effect reported in the last model in Section 7 supports this notion. The fact that both of these effects are significant is a strong indication that social embeddedness is a factor that has to be taken seriously in any attempt to explain the rationale for any firm's conduct in a group of organizations belonging to the same system.

The paper also explores the alternative explanation that any observed similarity between the firms is simply due to the fact that the firms are facing a similar market for executives. The market-based measure introduced in Model 3 supports the notion that firms facing the same market situation are more similar. However, it does not alter the observed similarity resulting from my network measures, thus suggesting that both these mechanisms are operating on the dependent measure.

Finally, and in addition to the observed network effects, it is worth noting that the economic determinants included in this study are similarity measures — which, moreover, show a strong positive relationship to similarity in remuneration. In certain ways this indicates that the existence of normative behavior among the publicly traded firms is likely to be based on observation. This finding suggests that the population of publicly traded firms in Sweden as a whole functions as a reference group for the behavior under consideration. One consequence of this is that studies investigating a sample based on firm size, for example (see Mizruchi, 1996) might misapprehend normative aspects originating from the excluded firms' characteristics.

A more general implication of this study is that information about different compilations of groups at the micro-level can yield important insights about the way explanatory factors can differ across units at different levels of aggregation. In terms of the results I have presented here, firms tend to behave more like other firms when their directors are part of the same social network than when they are not. Furthermore, as the results of this study imply, it is essential to recognize the possibility of multiple networks and, when possible, to assess their relative importance for the behavior under study. Hence, to neglect these multi-dimensional micro-level dependencies when modeling firms' behavior is likely to lead to a misspecification error.

It seems unlikely that similar structural dependencies should not be present even in other types of reward structures in these companies. Another important, and possibly conflicting, relational aspect also needs investigation, namely how overlapping ownership among firms feeds into the model as a possible source of similarities or dissimilarities among the firms. It is my conviction that if we want to explain top-level organizational decisions, then the structure of interaction among the directors of the relevant organizations also has to be taken into account. And although network studies are complex and demanding as far as data are concerned, the present study has shown that this is both a possible and an important task.

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