6. Networks, distributed knowledge and economic performance: evidence from quality control in corporate legal services

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This chapter examines the relationship between distributed knowledge and economic performance in a professional, or 'collegial', organization. It identifies a few conditions under which the pattern of knowledge flows is most productive for firms stressing quality professional services. In such organizations, the production of services for clients is difficult to routinize, professional expertise and advice cannot be easily standardized, and therefore 'internal' transaction costs related to flows of resources, including knowledge, can be assumed to be a large part of total costs for the firm as a whole. The practical problem for professional services firms can be represented as reducing complexity and constructing certainties in order to provide quality advice (Dingwall and Lewis 1983; Lazega, 1992b; Sciulli, 1986) for clients. In order to achieve such knowledge-intensive work on a regular basis, intelligence is shared in two types of situation at least: in common work on cases or in case-related advice relationships. Saying that intelligence is 'shared', however, does not do justice to what really happens in social exchanges and in the flows of knowledge and experience. The important characteristic of such flows is shown to be that knowledge as a resource is efficiently distributed/allocated through two processes: selection of exchange partners (social niche seeking) and concentration of the authority to know (through status competition). Some members emerge as having the authority to know, although such status is fragile (Blau, 1964). These processes of knowledge allocation are micropolitical processes because they multiply the number of authorities and trigger status competition, but they are efficient too. Efficiency can be measured, I argue, in statistical evidence concerning the relationship between crude measurements of economic performance and position in social networks related to this allocation of knowledge. An empirical study of a medium-sized north-eastern US corporate law firm is used for that purpose. Distributed knowledge is measured through two types of networks: a network of co-workers with whom

the 'Whole Picture' of the case is shared; and the advice network within the firm. Members' individual performance data (hourly rates, number of hours worked, fees brought in) are analysed as an effect of position in these networks. Dependence of economic performance on the overall pattern of ties in the two networks is also established. This suggests that proxy measurements – based on social network analysis – of productivity are possible in knowledge-intensive organizations, a thorny issue in contemporary economics (Gadrey, 1996). This approach to productivity, however, must recognize that knowledge and 'learning goods' in general are massively produced, allocated and circulated in society (and particularly in an organizational society) through politicized social exchanges that differ from market processes.

QUALITY CONTROL FOR KNOWLEDGE-INTENSIVE WORK

Maintaining quality through capitalization of authorized knowledge and sharing experience is not an easy process in knowledge-intensive organizations. A professional services firm (PSF) is usually not a capital-intensive organization producing material goods and relying on economies of scale in an industrial sense. It produces knowledge-based services evaluated by their level of quality. But quality is difficult to measure. There are formal mechanisms, such as official peer review committees, that can perform this task; but these mechanisms raise suspicion of being politicized. The question is then: does such a firm rely on its own multi-level social exchange system to provide an informal mechanism of overall peer review and quality control? If so, how does it ensure accumulation and distribution of authorized knowledge and experience?

Lawyers' work, for example, is knowledge intensive in the sense of 'knowledge-in-action' (Flood, 1987; Gallouj, 1992; Lazega, 1992a) accumulated by experience, or 'judgement' – a word often used by members to characterize the quality of a colleague's legal work. This experience is necessary to the provision of legal advice to corporations. This task often requires designing new solutions to complex problems, taking risks, and sometimes persuading the client to adopt untested strategies. For this kind of innovative work, often invisible and not very spectacular, one needs a certain accumulation of knowledge-in-action or experience. Managing this capital of expertise means using all the available information technology (libraries, online services, a firm electronic memory and so on), but also – and most importantly – recruiting the best possible attorneys, keeping them, and helping them manage and update their knowledge base. Management consultants often call this the 'human capital' of the organization. Members must build and convert tacit and innovative knowledge into a shared instrument, and perhaps eventually into more

codified and routinized knowledge where pieces of information are already related to one another. Tacit knowledge can only be mobilized at the local level, in a decentralized way, between individual members. Indeed, if tacit knowledge and what collective learning produces are difficult to capitalize in a database, actors' 'live' and educated thinking must be taken into account.

Among members, concern for quantity is widespread, but the solution is relatively simple: the more partners and associates work (especially partners because their hourly rates are high), the more revenue they bring in. Concern for quality is also permanent, but here the solution cannot be standardized (by definition of a profession). Legal practice being knowledge intensive, based partly on a series of information management tasks, formal instruments are available (such as library, computer memory and standard documents). But there is no predefined standard of quality for this type of work. Much of it consists of using past experience to adjust to new problems through individual and collective learning (Gadrey, 1994; Gadrey and De Bandt, 1994; Favereau, 1994; Hatchuel, 1994a and 1994b; Starbuck, 1992). Thus it has to be done in common: cognitive efforts are more or less shared in brainstorming processes familiar to knowledge-intensive organizations. To avoid using the cognitive psychologists' term of 'distributed cognition', I use here the expression distributed knowledge.[1] Recall that partners, and to a lesser extent associates, are strategic in their effort to choose quality and loyal co-workers. They are constrained by specialization and (other) partners' decisions. Instead of an elusive predefined standard of quality, brainstorming processes include an informal quality control through common monitoring and through advice seeking. Thus economic performance and quality control depend on a social mechanism supporting individual efforts and competencies. The exchange system within and beyond social 'niche' boundaries is shown to provide a structural solution to problems of motivation and supervision in the absence of strong hierarchy.

In the light of this definition of professional work, distributed knowledge (as an organizational response to environmental complexity) is supposed to help. But contrary to what is asserted by many PSF specialists, information technology and human capital are not sufficient to ensure a high level of quality. Activities driven by market reaction do not necessarily encourage innovation and creativity (Alter, 2000; Gallouj, 2002); they can develop short-term adaptation. This raises the issue of quality control as a social process, and that of sharing experience in order to improve the quality of work when needed. The way in which the firm manages this issue is often called 'peer review'; it is the starting point of empirical analysis in this article. Many partners in PSFs tend to consider formal peer review to be costly, difficult to implement and inefficient. But informal peer review also takes place in order to try to maintain a high level of quality. Members observe

each other's performances and evaluate (mostly informally) each other's production: they praise big successes, and indirectly sanction (that is, criticize and gossip about) blunders and mistakes (Bosk, 1979; Reynaud, 1989; Wittek and Wielers, 1998).[2] In the first section, I examine how members of a corporate law firm conceive of peer review, in particular peer review of the quality of work.

Spencer, Grace & Robbins, a Corporate Law Firm

Fieldwork was conducted in a north-eastern US corporate law firm, Spencer, Grace & Robbins (71 lawyers in three offices located in three different cities, comprising 36 partners and 35 associates) in 1991. All the lawyers in the firm were interviewed. In Nelson's (1988) terminology, this firm was a 'traditional' one, without formally defined departments, as opposed to a more 'bureaucratic' type. Interdependence among attorneys working together on a file could be strong for a few weeks, and then weak for months. As a client-oriented, knowledge-intensive organization, it tried to protect its human capital and social resources, such as its network of clients, through the usual policies of commingling partners' assets (clients, experience, innovations) (Gilson and Mnookin, 1985) and the maintenance of an ideology of collegiality. Informal networks of collaboration, advice, and 'friendship' (socializing outside), were key to the integration of the firm (Lazega, 1992b).

It was a relatively decentralized organization, which grew out of a merger, but without formal and acknowledged distinctions between profit centres. Although not departmentalized, the firm broke down into two general areas of practice: the litigation area (half the lawyers of the firm) and the 'corporate' area (anything other than litigation). Sharing work and cross-selling among partners was done mostly on an informal basis. Given the classical stratification of such firms, work was supposed to be channelled to associates through specific partners, but this rule was only partly respected. A weak administration provided information, but did not have many formal rules to enforce. The firm had an executive committee comprising a managing partner and two deputy-managing partners who were elected each year, renewable once, among partners prepared to perform administrative tasks and temporarily transfer some of their clients to other partners. This structure was adopted during the 1980s for more efficient day-to-day management and decision-making. The current managing partner was not a 'rainmaker' and did not concentrate strong powers in his hands. He was a day-to-day manager who made recommendations to functional standing committees (finance, associate, marketing, recruitment and so on) and to the partnership.

Partners' compensation was based exclusively on a rigid seniority system without any direct link between contribution and returns. The firm went to

great lengths – when selecting associates to become partners – to avoid individuals who may not 'pull their weight'. Partners could argue informally about what contribution might 'fairly' match one's benefits, but the seniority system mechanically distributed the benefits to each once a year. Great managerial resources were devoted to measurement of each partner's performance (time sheets, billing, collecting, expenses and so on), and this information was available to the whole partnership. A low performance could not be hidden for long. However, the firm usually made considerable profits, which could help partners overlook the fact that some voluntary contributions to shared benefits were not always consistent with the successful pursuit of narrow self-interest.

The firm did not have a formal peer review system that could provide intermediate steps between lateral control and formal court procedures. Before expulsion, partners had the power to 'punish' each other seriously by preventing a partner from reaching the next seniority level in the compensation system. A partner could be expelled only if there was near-unanimity against him/her. Buying out a partner was very difficult and costly. Therefore, despite the existence of direct financial controls, the firm did not have many formal ways of dealing with free-loading. The harm that a single partner could inflict on others might become very substantial in the long run. Conversely, partners could try to insulate one of their own informally by, at the very least, not referring clients, not 'lending' associates, not providing information and advice.

Avoidance of Formal Peer Review

Among organizational processes that collegial firms (as well as others) deal with, peer review, that is, the evaluation of one's partners' work, is certainly one of the most sensitive and sometimes upsetting. Even more so when the review applies to the quality of work, not only to the economics of productivity. Some firms have a peer evaluation mechanism that looks at every person's 'professionalism' and tries to improve it. Especially under pressure from malpractice insurers, professional firms recognize the need for maintaining or upgrading their overall level of professionalism. Financial incentives are given to firms by these insurers to implement quality control. The financial incentives are tied for instance to in-house continuing legal education courses, or to intake policies which allow the firm to stay out of work that is likely to cause insurance claims. Despite a tradition of Yankee individualism and a belief that they are part of the elite of the profession, the firm had raised the issue, and was trying to find a methodology for helping partners look at what other partners do.

At the time of the study, it had not implemented a formal peer review system for the quality of work in which some partners go and check through other people's files and determine whether 'they did the matter right'. They relied on a less systematic or informal system (complaints). The main official

argument against a more formal system was its high cost. It costs the client or the firm money to put two lawyers on a matter where one will suffice, where one is seen as just serving as a shadow of the other. Resistance to the implementation of formal review mechanisms was widespread. The more senior lawyers did not welcome any change that seemed to detract from the informality of earlier practice. Many partners said that they did not worry about the quality of work of their colleagues, that the problems were with partners who were not working hard enough or taking in lousy business. Many were sceptical about quality peer review, either because of practical difficulties or because of more substantive ones, such as defining the quality of service rendered:

> The peer review that we have right now is everyone sits down in the partners' meeting and you have in front of you the printout that shows you how many hours I worked, how many hours I billed, how many hours I collected and how outstanding my account receivable is, and then you get people grumbling at the meeting about the account receivables going up and not coming down. But as far as whether I am doing a good job on my work, unless they get a call from a client complaining about me, some kind of peer review as to quality of work, I think that will be hard to implement. I suspect it would be resented by many, and at least at the stage we are at, I don't think I want to be reviewing somebody else's work and decide whether it is good or not. I am too busy, I don't want to do somebody else's work, I want to do my own. The managing partner will have a hard time implementing a systematic second opinion. (Partner 29)

Rather, the firm counted on a proactive form of quality control. By this I mean: (1) the fact that its members shared the *whole picture* of the cases with their co-workers; and (2) the fact that they sought each other's *advice* or second opinion and shared their experience before they made decisions or sent opinions out to clients. From the perspective of the organization, relationships between members were necessary to share knowledge and experience. Especially in situations where members worked together, they depended on each other for these resources. Knowledge could be capitalized in members' individual live memory, but its use also depended on their work and advice relationships. Indeed reasoning exclusively in terms of human capital, presupposes that, once in business, members freely share their knowledge and experience with one another. We know that this is not an obvious fact, especially since Blau (1964) showed that status is central to such games.[3]

Proactive Quality Control: Sharing the Big Picture?

How do members of a PSF share knowledge with co-workers? In task forces, members combine cooperation, status competition and knowledge management in various ways, depending on their experience of this competition with

specific co-workers. In order to show that quality control was ensured by the multiplex exchange system in the firm, it is important to show that members shared knowledge in their brainstorming processes and competed for professional status derived from 'knowing best' in their deliberations (Lazega and Pattison, 1999). Additional data was collected about this topic. Specifically, the lawyers were all asked with whom they had intensive work relationships within the firm; then they were asked to check the names of their co-workers with whom they felt that they usually *shared the whole picture of the cases* on which they worked together. A sub-network of co-workers, the 'Whole Picture network' was thus identified: it included the subset of colleagues with whom knowledge and expertise was felt to be shared. Arguments were then provided to explain why sharing did or did not take place. These arguments were examined for elements concerning social niche seeking and status competition.

In other words, I assume that members try to work in social niches (Lazega, 1999b), but also that in such niches this issue of knowledge sharing and quality control is often connected to the issue of the authority to know. A partner handling the case was often in a position to select among his colleagues those with whom he or she will allow professional status competition to take place. When a partner did not share the whole picture of the case with a colleague who also worked on this case, there could not be much status competition.[4] Someone who does not know enough about a case cannot display professional judgement. When a partner shared selectively the whole picture of the case with one colleague working on this case, but not with another, status competition was usually limited to a dyadic tournament.

Status and knowledge were also combined in associates' attitudes to work. The analysis of the arguments provided by associates to justify their sociometric choices in this vignette shows that associates were quickly made particularly aware of such issues because the firm could not guarantee a partnership to all of them. In the absence of a career prospect within the firm, they were told that they would receive training and develop skills and competencies which would help them manage their own career elsewhere if they did not reach the coveted position. In other settings, members are told that they need to think about their 'employability' on the labour market; permanent training and learning are presented as the way to increase it. Traditionally, associates complain about lack of training, about being kept in the dark, about not really knowing how what they do fits into the whole picture of the case. They may work very hard to make urgent deadlines, they sometimes do not know why things have to be done in a hurry and what is the scope of the project, or the gameplan. The decision as to whether they were getting the whole picture was the partners', not theirs. Such complaints also reflected the frustration of not being able to participate in the professional status competition. They came almost exclusively from junior associates. But more senior associates usually

had the feeling that they participated much more: some could sometimes be choosy with regard to the cases in which they would like to get seriously involved. They were particularly selective. Some cases were not worth any professional status competition, some were.

Thus, the decision to share was surrounded by reasoning about partners' personal style, about the nature of the task, and about control. A very unclear division of labour existed in the sharing of background information. The deliberation process was qualified here in various ways, and the ongoing attempts at control of the authority to know, and indirectly at control of decisions, was made explicit several times. In the case examined here, partners were never accused of mistreating associates. They were sometimes accused of not playing the status competition game in a way that provided the associate with an opportunity to increase his/her professional status.

The analysis of the Whole Picture network shows that respondents were selective in their identification of knowledge sharers. But the density of the network was still 0.16, which was not much lower than that of the co-workers and advice networks (respectively 0.22 and 0.18). Analysis of the aggregated choices confirms that sharing knowledge did take place in social niches. The formal dimensions of firm structure were used as identity criteria by members who felt that they shared knowledge with their co-workers. They tended to consider that they shared the whole picture with colleagues in the same office who shared their speciality, although this was the case for Office I members much more than for Office II members. Litigators felt that they shared mostly with other litigators, mainly in Office I, and almost equally for partners and associates. The same was true with corporate lawyers, although a little less obviously so. When lawyers felt that they shared with members of other offices, it was mainly with partners – another indicator confirming the stratification of the system. One interesting result is that status differences did not prevent partners from feeling that they shared within the same office, although it did across office boundaries. At least, overall, partners felt more often that they shared mostly with other partners, but that effect is not statistically significant. It seems that, for partners, status did not matter as much as one would expect when sharing the whole picture. Status mattered much more for associates, who felt that partners who worked intensively with them also shared background information much more than other associates did. Associates who felt that they shared with other associates were mainly litigators from Office I.

Centrality measures in the network show that many partners and senior associates were identified as background information sharers by many others. Senior partners even tended to underestimate the extent to which they shared, when compared to what their younger co-workers felt about the issue: many co-workers considered that these senior partners did share the whole picture with them, whereas the latter said that they did not! In contrast, a few partners

(for example Partners 15, 24 and 26) strongly overestimated the extent to which they shared: they asserted that they shared with almost all their co-workers, whereas only one-third of the latter confirmed this assertion.

In conclusion, the analysis of the Whole Picture network shows that status differences were temporarily downplayed in the deliberation process with one's immediate co-workers, and were more salient (overplayed) with other members of the firm. Next, in order to understand such status games more clearly, I analyse the advice network as the key network combining status and knowledge.

Informally Distributed Knowledge and Competition for the Authority to Know

The second way in which knowledge was circulated was through the advice network. In order to recognize the importance of social exchanges for quality control, one has to accept that quality of production is not a manifest variable (White, 2002). It is grasped as an implicit ranking, a local information inferred from status and rank. Transfers and exchanges of advice reflected this specific pecking order and form of status in the firm – a fragile order since everyone was allowed to hope to climb the professional ladder by impressing his/her colleagues. Indeed, competition for professional status was one reason why the fact of providing advice was kept so distinct from that of collaborating on a case. Moreover, personalized access and multiplex ties to sought-out and selective advisers could help advice seekers in stretching advice as much as possible before it became collaboration.

It was in members' collective economic interest to share information and experience as much as possible, but it was also in their individual interest – given status competition – to do so while increasing as much as possible their individual credit and stressing the value of their own knowledge and experience. Knowledge was not necessarily 'freely' or randomly shared under task force relational pressure. It was shared by the prospect of increasing one's firmwide and more general professional status. Once they had been provided with resources and with a sense of their interests beyond the short term, members needed another level of social approval if they wanted to increase their status within the firm. This form of status could be called 'professional authority or reputation'. Whereas individual economic performance was strongly associated with team membership and relational constraint (Lazega, 1999a), professional reputation was also based on the capacity to be recognized beyond local niches. The firm as a multi-level exchange system was thus a form of productive social mechanism when it helped members extend beyond their niches. In this section, I also look at how they concentrated the authority to know in the professional status of a few select partners. I argue that much of the proactive quality control was performed by seeking these members' advice on task related matters. Professional status allows members to push and sometimes impose their standards and criteria of quality.[5]

The main actors in the advice network of the firm – who had acquired a form of status that attracted some deference – are identified below.[6] Several local rules related to the circulation of advice within the firm have already been extracted from the analysis, among which the most important identified above is that one does not seek advice from people 'below.' This concentration of the authority to know may be puzzling in an organization where members were jealous of their professional discretion and individual intellectual autonomy. It is less so when considering the problems raised by formal peer review of quality of work – problems already sketched above. This social process of capitalization and sharing of knowledge was inextricably related to quality control through professional status and epistemic alignment. It was a complex process: it was necessary, but also costly. Protecting this expertise from opportunistic behaviour was a permanent preoccupation.[7]

The joint analysis of members' indegree (that is, the simple count of the number of times each member is chosen as an adviser by all the others) centrality scores and prominence scores confirms precisely that multilevel dimension of professional status. Indegree centrality scores show that members cited most often (more than 25 times) were the following: Partners 4, 12, 13, 16, 17, 19, 20, 22, 24, 26, 27, 28, 30, 31, 34, and Associates 40, 41, 42, 55, 65 and 66. This list includes a few senior partners, in particular those with an open door policy, either for senior associates, or even, as for Partner 13, for everyone. Senior associates and younger ones with high scores were mostly cited by other associates below or near them, with exceptions that will be examined below. However, Burt's (1982) prominence scores, which include a measurement of the importance of the people who cite the focal member, identify Partners 1, 2, 4, 6, 12, 13, 15, 16, 17, 20, 21, 24, 26, 28 and 34 as the most prominent. The difference between the two measures shows that Partners 1, 2, 6, 15, and 21 were cited by few colleagues, but by colleagues who were themselves important ones, mainly partners and senior associates. In addition, prominence scores for top partners are increased by the fact that, while being heavily sought out, they themselves sought out fewer people.[8] Partners 13 and 34 are still in the list but with relatively lower scores because they attracted a heavy volume of associates' citations (women associates for Partner 34, who was one of the three women partners).

Peer evaluation of quality is in the task-related advice network, and the way in which the advice network was stratified is a useful characteristic for our purpose.[9] Since quality in this context is linked to knowledge and experience, a reputation 'market' was created in the firm. We also know that the advice

network had both hierarchical (or centre/periphery) and clustering tendencies with an emphasis on hierarchical arrangement.[10] Advice was sought within and across social niches; requests for advice and professional status recognition converged towards positions of partners, with senior associates as exceptions. Seniority in general was important here for achieving cognitive alignment or co-orientation around a common definition of the situation in collective action, that is, for the legitimacy of a certain course of action. Members rarely sought advice from others below them on the seniority scale: thus the longer you were in the firm, the more people came to you for advice (and the less you sought advice). They also tended to seek advice from others in their own niche, that is, from members similar in office and speciality. However, given the number of seniority levels in the pecking order, it was unlikely that junior associates would seek advice from senior partners. The latter would be overwhelmed with questions below their status. Therefore, it was very likely that members would seek advice from more senior members closer to them on this ladder.

In sum, professional status is an important form of status in knowledge-intensive organizations which count on members' capacity to innovate and maintain informal quality control; and a centre-periphery structure shows the existence of firmwide professional status. This implies a convergence of requests for knowledge in the system of 'distributed knowledge'. The distribution of the authority to know – produced by the multi-level exchange mechanism – inferred from the pattern of the advice network provides a clearer picture of the informal quality control process that took place in the firm as a result of avoidance of formal peer review. A few central members were key to this form of informal and indirect control. In a collegial environment, distributed knowledge not only means stratification of this relational structure. It also means multiplication and competition between top professional authorities; such a multiplication characterizes the learning process in knowledge-intensive firms. The next section stresses the fact that the dynamics underlying the quality control process examined here had a visible impact on economic performance.

INFORMALLY DISTRIBUTED KNOWLEDGE AND ECONOMIC PERFORMANCE

In any organization, measurements of performance are intrinsically difficult to interpret and their informative value can change from one year to another.[11] Managers know that performance data are never as 'hard' and indisputable data as one often expects them to be (Granovetter 1985; Nohria and Eccles 1992; Meyer, 1994).[12] A narrow conception of organizational efficiency

ignores the fact that no measurement of actor's performance goes unchallenged within the organization. Therefore using performance measurements as a dependent or independent variable is not easy, and rarely provides spectacular results. Nevertheless, in this chapter, I propose a test of the idea that specific relational patterns shaping the flows and distribution of knowledge in organizations are correlated with various measures of economic performance.

Many factors account for members' individual performance. These factors can be external or environmental (some areas of practice provide more work, some markets are currently more lucrative) and individual (some attorneys are personally more motivated or hard working). For these reasons, the following analyses link information on members' economic performance – narrowly understood, for example, as the amounts of fees brought into the firm at the end of the year – with information on social status and *relationships* among them. Differences in such performance may be explained, in part, in terms of relationships within the firm, for instance because relational factors can help gain access to needed resources, reduce 'transaction costs' with co-workers, or help pressure colleagues back to more productive behaviour. To examine such effects on performance, I used information collected about each attorney's (partner and associate) relationships within the firm and combined it with information on their individual performance for the year before the study was conducted.

To study the effect of position in firm structure on this type of economic performance, I use regression models with measurements of such performance as dependent variables, and various social factors related to firm structure, work process, and members' ties in the year of fieldwork as independent variables. I first use as covariates three dimensions of formal structure of this firm that were expected to be the most important (status, office, speciality), as well as two attributes of members defined from outside the firm (gender and lawschool attended). Table 6.1 presents the distribution of lawyers in this firm per variable.

The first covariate is formal status, a variable with two levels, partners and associates. We can hypothesize that status matters for economic performance in the sense that firm rules required associates to put in more time than partners. This variable is elaborated upon in the second covariate, seniority. We can hypothesize that seniority matters for economic performance in the sense that the more senior members were, the higher the hourly rates systematically charged to clients. This second covariate is a variable with eight levels, indicating the three possible levels of seniority for a partner,[13] and five levels of seniority of associates. For associates, seniority had the meaning of being a member of a cohort recruited the same year. We can thus look at gradual effects of numerical rank on economic performance. Office membership and practice are the third and fourth covariates. Office is a variable with three

Table 6.1 Distribution of lawyers per variable

Formal Status	Partner	Associate	
Seniority level 1	14	7	
Seniority level 2	13	10	
Seniority level 3	9	5	
Seniority level 4		7	
Seniority level 5		6	
Office I (Boston)	22	26	48
Office II (Hartford)	13	6	19
Office III (Providence)	1	3	4
Speciality: Litigation	20	21	41
Speciality: Corporate	16	14	30
Man	33	20	53
Woman	3	15	18
Lawschool: Ivy-League	12	3	15
Lawschool: New-England Non-Ivy-League	11	17	28
Lawschool: Other	13	15	28
Total	36	35	71

levels, Office I, II and III; practice with two levels, litigation and corporate. They are expected to have an effect on economic performance as indicators of variations in market demand. The next covariates are other actors' attributes, gender and lawschool attended. These attributes are included as control variables representing two characteristics of the outside world that could have an influence on economic performance. In this firm, women attorneys were mostly associates and often felt that they needed to work harder than their male colleagues to reach the same economic results, for example because they mostly had to deal with male clients or partners. Lawschool attended is a variable with three levels, indicating whether a lawyer went to an Ivy League lawschool, to a New England non-Ivy League lawschool, or to another lawschool. This variable is introduced in the model to examine the extent to which a form of prestige acquired outside the firm may have an effect on the extent to which one was assigned work with extra-lucrative clients.

To locate members in the informal relational structure of the firm, I use two kinds of variable (indegree centrality scores and constraint scores) derived from standard sociometric information on three types of relations collected in this firm in 1991: co-workers, advice and friendship ties. First, their individual

indegree centrality scores in these networks. As already mentioned, indegree centrality represents a measurement of the extent to which members are 'popular' in these networks and therefore accumulate resources circulating in them (Wasserman and Faust, 1994, pp. 169–219). One can therefore hypothesize that they will be in a better position to perform economically. Second, their individual constraint scores as defined by Burt (1992) in the same networks. For Burt, network constraint measures 'social capital' as a form of network structure. Specifically, constraint is a function of network size, density, and hierarchy (that measures the extent to which relations are directly or indirectly concentrated in a single contact). A contact in which relations are concentrated is a 'knot' in the network, making it difficult for negotiations to proceed independently in separate relationships. Constrained networks leave little opportunity for individual initiative, little chance to withdraw from difficult relationships. Difficult relations persist because they are interlocked with cooperative relations. The higher the constraint, the fewer opportunities for alternatives offered by one's contacts or contacts' contacts, and the lower the performance. In our case, constraint represents a measurement of the extent to which colleagues can exercise unobtrusive but insistent pressure on a member. High constraint in a specific network means that clique members in that network have high investments in each other and high expectations from each other. The denser a member's personal network of co-workers, for example, the more co-workers can coordinate their informal efforts at prodding him/her back into performing more (Lazega, 1999a). They can, for instance, try to increase their own collaborations with him/her, and exercise unobtrusive but insistent pressure to put in more time.

Using these covariates, several models were estimated to explain economic performance measured as the amount of fees brought to the firm (managing partner not included) in the year of fieldwork. It is important to realize that not all the covariates representing various dimensions of position in firm structure can be used at the same time, because of strong dependency between them. This is typically the case for status and seniority; in the models, the most refined covariate, seniority, is used. In addition, status and seniority overlap with the number of hours worked and hourly rates as explanatory variables. The more senior, the more attorneys charged per hour. Associates worked longer hours than partners. Therefore, to avoid this problem, analyses below test the robustness of relational capital effects using three different models. This multi-colinearity will be taken into account in the interpretation of results. In terms of economic and relational variables, the best overall models achievable with this dataset predicting the number of hours worked and the amount of hours worked and the amount of dollar fees brought in are presented in Table 6.2.

The significant effect of centrality in the advice network in Models 2 and 3

Table 6.2 Variables explaining economic performance measured by the number of hours worked (model 1) and by the amount of fees brought into the firm (models 2 and 3) in 1990 (OLS regression models)

Effects	Standardized estimates		
	Model 1	Model 2	Model 3
Seniority	0.01	0.76***	
Hourly rates			0.78***
Time input[a]			0.40***
Office	0.24**	0.15*	0.05
Speciality	–0.16*	0.01	0.07
Gender	–0.03	0.00	0.02
Lawschool attended	–0.14	–0.03	0.02
Centrality friendship	–0.27*	–0.11	–0.01
Centrality co-worker	0.17	0.01	–0.02
Centrality advice[b]	**–0.02**	**0.27***	**0.23***
Constraint friendship	–0.81***	–0.15	0.11
Constraint co-worker	0.23*	0.16*	0.13*
Constraint advice	**–0.04**	**–0.05**	**0.04**

Notes
*** p<0.001, ** p<0.01, * p<0.05. Adjusted R-squares are 0.66, 0.86 and 0.89 respectively. The managing partner, who concentrates on firm policy and administrative work, and is not a time keeper during his tenure, was not included in the computations of these parameter estimates.
a. Including the interaction effect of time input and hourly rates does not provide additional insights here because senior partners who charge the highest rates are not among the members who put in the greatest number of hours.
b. Centrality in the advice network represents the concentration of informally distributed knowledge examined in the text.

in Table 6.2 suggests that seniority and concentration of requests for knowledge was a determinant of strong performance in this case. This effect is added to that of higher hourly rates for senior partners and to that of constraint in one's workgroup (or task force). Recall that members got their advice in social niches, but also outside the niche, among partners with a specific form of status: it was not only technical expertise, but authority based on experience and willingness to risk an already well established reputation. Partners with high indegree scores in the advice network had high hourly rates ($r = 0.47$) and brought in more fees (in terms of dollars collected; $r = 0.42$).[14] Being sought out for advice was strongly correlated with being senior ($r = 0.46$), with years spent in the firm ($r = 0.48$), with age ($r = 0.43$), with being a partner (as differentiated from senior associates, who were also sought out for advice; $r = 0.30$)

and with coming from an elite lawschool ($r = 0.28$). Members sought out for advice tended to seek others for advice less (correlation between indegree and outdegree centralities is negative: $r = –0.28$), which confirms a status competition effect (one does not seek advice from people below). In short, processes connected to social status as well as to density of one's work relationships were key to the efficient distribution of knowledge.

CONCLUSION: LEARNING GOODS AND SOCIAL EXCHANGE

The problem of quality control, which was used to examine the distribution of authoritative knowledge and experience in a professional services firm, is a structural problem to which social exchange systems in PSFs provide a structural solution. Formal peer review being highly problematic, the focus was on yet another way in which this system remains productive: by allocating knowledge and helping members share experience – a crucial resource, too often considered to be exclusively individual 'human capital' – in spite of well-known professional status competition processes. The social exchange system provided a functional equivalent of peer review, an informal mechanism of quality control. In particular, the analysis of the pattern of advice network in the firm shows how the distribution of 'professional status' concentrated the authority to know in the hands of a few partners; it functioned as an informal quality control mechanism providing a form of allocation of knowledge and co-orientation. In such a knowledge-intensive organization, such a relational mechanism is even more important for collective action than it is in other types of organization. The pattern of advice relationships sustains quality through co-orientation by distribution of professional authority, while providing a social solution to the problem of capitalization of knowledge and experience.

Finally, this chapter studied the relationship between distributed knowledge and economic performance in order to show that it is worth studying the logic of social exchange of learning goods in order to understand productivity. In the professional, or 'collegial', organization under examination, the conditions under which the pattern of knowledge flows was most productive for firms stressing quality professional services included the existence of two processes: selection of exchange partners in the co-workers network (social niche seeking) and concentration of the authority to know in the advice network (through a form of professional status competition). Some members emerged as having the authority to know, although such status was fragile. This allocation of knowledge is a micropolitical process, but it was efficient too. This efficiency can be partly measured, I argued, in statistical evidence concerning the relationship

between crude measurements of economic performance and position in social networks related to the allocation of knowledge.

This understanding of the process through which non-standardizable knowledge-intensive work is carried out provides insights into productivity. In effect, when combined with other results concerning economic performance, the existence of a consistent link between social networks (that of cooperation and advice) and economic performance opens up an avenue for proxy measurements of productivity in knowledge-intensive organizations, a thorny issue in contemporary economics (Baumol and Wolff, 1983; Gadrey, 1996). This approach to productivity, however, must recognize that knowledge and 'learning goods' in general are massively produced, allocated and circulated in society (and particularly in the organizational society) through politicized social exchanges that differ from market processes.

NOTES

1. This distinction is not simply cosmetic. The idea of distributed knowledge rests upon a different conception of actors' cognitive work. It is driven by what can be called 'appropriateness judgements' (Lazega, 1992a), which involve ingredients such as status and authority, two concepts entirely absent from cognitive psychologists' (and sometimes even cognitive sociologists'!) work. In my view, transforming individual knowledge into social and shared knowledge raises issues familiar to economists interested in the production of collective goods. This can only be dealt with by bringing in a different behavioural theory, one that takes into account the existence of competition between various kinds of legitimate authority.
2. In the law firm examined here, Goffman-like stories circulated about big mistakes. For example

   > There is really a distinction between the people who were there from older generations, or because their father was the president of a big utility company, often very decent human beings but sometimes not very smart. One often used to make terrible mistakes; he was not a very good trial lawyer. I realized that at the time so I would frequently save his ass; I always pushed our clients to settle their case rather than let him screw their case in court. (A former partner)

3. See Burt (1992) and Flap (1999) and Flap et al. (1998) for the general idea that, in many ways, returns on human capital depend on members' relational capital.
4. From the individual partner's point of view, autonomy with regard to shaping one's own practice and with regard to hierarchy went together with a certain form of opacity of activities in the firm. In their cooperation with one another, members reduced this opacity. But they could still choose whether or not to go beyond a simple reduction of opacity and share background information (thus transfer or exchange knowledge and experience more systematically), or instead rely on the capacity of the partner in charge to divide the work among his co-workers.
5. This is possible by a relational mechanism that I have called elsewhere 'epistemic alignment' or 'co-orientation' (Lazega, 1992a), which is based on the interactive dimension of members' 'appropriateness judgements'. Quality control is thus more generally related to epistemic dimensions of collective action.
6. In their epistemic behaviour, individuals producing together legal help act as members of the firm *and* as members of a profession. Individuals must share similar categorizations in order to work together. Similar categories are created and maintained by people with power, who create categories and category orderings which are favourable to them.

7. PSFs recognize that protecting their knowledge is next to impossible, which is why members are encouraged to publish it and use it to be recognized as specialists, in a mix of academic and marketing approach.
8. Some interpreted this as a form of professional 'arrogance' or complacency. However, recall that this law of seniority also limited their pool of available advisers.
9. General density of the advice network is 0.17. Answers varied considerably in quantitative terms. At both extremes, we have a partner who said that he did not need nor ask anyone for advice, and another partner who declared seeking advice from 30 other colleagues. For extensive use of network diagrams and analyses to illustrate the social relationships described in this chapter, particularly the centralized nature of this advice network and the effect of status competition in it, see Lazega (1995). For a general introduction to network analytical tools, see Wasserman and Faust (1994).
10. Based on various statistical models (Lazega and Van Duijn, 1997; Lazega and Pattison, 1999) we know that the local organization of advice relations has positive parameters for transitivity and reciprocity, but the latter are weaker than for other types of tie, mainly because of status competition. 3-cycles (that is, generalized exchange with indirect reciprocity) were unlikely in the advice network. Parameters for 2-in-stars, 2-out-stars and transitive triads are positive (as well as the parameter for reciprocated ties) and the parameter for advice ties of length 2 is negative. The contribution of the advice out-star configuration is to suggest the tendency for an individual to seek advice from multiple, unrelated others, while the contribution of the advice in-star parameter is to suggest the likelihood that an individual may receive requests for advice from several unrelated individuals. It is interesting that the parameter for paths of advice ties of length 2 is negative, while the parameter for transitive triads is positive, and it is tempting to hypothesize that paths of advice ties created the potential for new advice ties. Certainly, the collection of important substructures of advice ties is consistent with a relation that exhibits tendencies both to clustering and hierarchy but, as noted above, with an *emphasis on informal hierarchical arrangements*.
11. For example, given the way a partner was compensated in the firm, focusing on the amount of fees actually collected in one year does not indicate exactly how productive this attorney was during that year. Work done in one year could be compensated the following year (or perhaps even later) and such overlaps made it difficult to disentangle an attorney's productivity in one year as opposed to his/her productivity in another year.
12. In addition, this type of temporary workgroup structure in which partners keep their autonomy in their negotiation of means and ends makes it difficult for a centre to identify and appropriate real or potential productivity gains. Therefore governance of these teams, when work is not defined as a standard process in the Taylorian way, also means that work is evaluated based on other standards, more local and subjective ones (in partners' minds).
13. Seniority is defined by the rank of partners in the letterhead, which is mainly based on age and years with the firm (with the exception of four partners who were hired away from other firms). Coding of seniority levels in *senior*, *medium seniority* and *junior* partners is based on cutoffs between Partners 14 and 15 (a difference of 8 years in age) and between Partners 27 and 28 (a difference of 9 years in age). These categories were explicitly used by the partners themselves.
14. Note that this is consistent with Frank's (1985) economic approach to labour markets, which asserts that incentives such as specific compensation systems take care of the negative effects of status differences. Thus, low performers and low status members tend to be overcompensated relative to the value they produce, whereas high performers and high status members tend to be undercompensated relative to the value they produce: they pay a price for being recognized as high status members. The firm's seniority system could therefore be considered to be a mitigation device for status competition among partners. A large majority of partners supported it because they believed that it prevented yearly conflicts among themselves, especially conflict about each member's value to the firm.

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