

1 Rediscovering the social in the economics of interfirm relations

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THE EMBEDDEDNESS APPROACH: A ROUTE BETWEEN ECONOMISTIC UNDERSOCIALIZATION AND SOCIOLOGICAL OVERSOCIALIZATION?

In the movie *Blow Up*, a photographer realizes that he has been the accidental witness to a murder. Unintentionally, he had taken a picture of the murderer's hand, although it proved to be blurred. In order to get at the truth, he enlarges the photograph. Although the enlargements make the individual grains of the photograph more and more clear, they also efface the image of the murderer. The information that results from the *ensemble* of the individual grains gets lost. Much as the photographer's intention in *Blow Up* was to produce a clear image of the murderer's hand, the utilitarian tradition in social theory is an attempt to detect the invisible hand that is guiding economic and social life. As with the photographer, the utilitarian tradition focuses on the individual grains in the fuzzy picture of social reality, namely on the atomized actors. As *Blow Up* strikingly demonstrates, it obviously is somewhat difficult to understand the overall picture from this perspective.

Continuing in the utilitarian tradition, classical and neoclassical economics operates with an atomized, *undersocialized* conception of human action (Granovetter 1985: 481). Not far from Hobbes's 'state of nature' or Rawls's 'original position', this tradition invokes an idealized state of affairs in which behaviour and institutions are not affected by social structure and relations. Production and consumption are allocated by competitive markets in which no individual producer or consumer noticeably influences aggregate supply or demand or, therefore, prices or other terms of trade. As Hirschman has noted, such idealized markets that involve

large numbers of price-taking anonymous buyers and sellers supplied with perfect information . . . function without any prolonged human or social contact between the parties. Under perfect competition there is no room for bargaining, negotiation, remonstrance or mutual adjustment and the various operators that contract together need not enter into recurrent or continuing relationships as a result of which they would get to know each other well.

(Hirschman 1982: 1473)

In classical and neoclassical economics, social relations between actors have been treated, if at all, as frictions that obstruct competitive markets. The *locus classicus* is Smith's well-known complaint that 'people of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in a conspiracy against the public or in some contrivance to raise prices' (Smith 1776/1979: 232). Consequently, Smith recommended that public registers of the members of the same trade should be done away with because such information 'connects individuals who might never otherwise be known to one another and gives every man of the trade a direction where to find every other man of it' (ibid.: 232–3). This policy prescription, as Granovetter (1985: 484) suggests, reflects the tacit recognition that social atomization is a prerequisite of perfect competition.

In recent years, the impact of social structures and social relations on economic action has been taken more seriously in economic theory. Social influences are no longer exclusively conceived of as frictional drags to competitive markets; however, they are still interpreted as divergent from rational action. Social influences are viewed as processes in which actors acquire customs, habits, or norms that they follow in a quasi-mechanistic way. Like a sort of cultural software, the social context determines the behaviour and decisions of actors in an unerring way. In this *oversocialized* conception, social influences are external forces that condition actors once and for all and render ongoing social relations and structures irrelevant (Wrong 1961). In the final analysis, the actor is as atomized as the *homo economicus* is; solely his calculus may be a different one.

As Granovetter has pointed out, the apparent contrast between under- and oversocialized views thus masks the fact that both share a conception of action and decision carried out by atomized actors:

In the undersocialized account, atomization results from narrow utilitarian pursuit of self-interest; in the oversocialized one, from the fact that behavioral patterns have been internalized and ongoing social relations thus have only peripheral effects on behavior. That

the internalized rules of behavior are social in origin does not differentiate this argument decisively from a utilitarian one, in which the source of utility functions is left open, leaving room for behavior guided entirely by consensually determined norms and values – as in the oversocialized view. Under- and oversocialized resolutions of the problem of order thus merge in their atomization of actors from immediate social context.

(Granovetter 1985: 485)

This atomization of economic actors is also predominant in the currently most influential accounts found in the 'new institutional economics'. These accounts, including the transaction-cost analysis of Williamson (1975, 1985), entail a mixture of under- and oversocialized assumptions. Williamson asked under what circumstances economic functions are performed within the boundaries of hierarchical firms rather than by market processes that cross these boundaries. His answer, concurring with the basic argument of the new institutional economics, was that the organizational forms that prevail are those that deal most efficiently with the cost of economic transactions. Those that involve uncertainty about their outcome, that recur frequently and require substantial 'transaction-specific investments' – of money, time, or energy that cannot be easily transferred to interaction with others – are likely to take place within hierarchically organized firms. Exchanges that are straightforward and nonrepetitive and that require no transaction-specific investment will take place between firms, that is, across a market interface. In this account, transactions are moved out of markets into hierarchies for two reasons. The first is 'bounded rationality': the inability of economic actors to write contracts that cover all possible contingencies. When transactions are internalized, there is little need to anticipate such contingencies; they can be handled within the firm's 'governance structure'. The second reason is 'opportunism', that is, the rational pursuit by economic actors of their own advantage, by every means at their disposal, including guile and deceit.

[F]ollowing the tradition of individualistic social scientists, Williamson puts forward a model of individual human nature (i.e. 'opportunism') and recklessly assumes that this applies equally to quite different forms of institutional arrangement. . . . No recognition is made of the effect of the institutional environment in moulding actions and beliefs.

(Hodgson 1988: 211)

In the transaction-cost approach, as in the classical ones, under- and oversocialized concepts complement one another. The 'market' resembles the undersocialized conception of the atomized and anonymous exchange of classical political economy which neglects the role of social relations among individuals in different firms in bringing order to economic life. As in Hobbes's *Leviathan*, the problem of disorder consequent to the atomization of the economic actors is 'solved' with an oversocialized concept of hierarchical power within the firm, which deflects opportunism by making potentially divisive decisions by fiat.

In this book, which follows Granovetter's (1985, 1988, 1989, 1990) embeddedness approach, the aim is to avoid the social atomization of economic actors implicit in the under- and oversocialized assumptions of the new institutional economics. Moreover, social influences are not simply conceived of as frictional drags. Rather, they are also seen as contextual factors that support economic behaviour (Matzner 1991). The way in which social factors may support economic behaviour is indicated by Hodgson:

[I]n a world of uncertainty, where the probabilistic calculus is ruled out, rules, norms and institutions play a functional role in providing a basis for decision-making, expectation and belief. Without these 'rigidities', without social routine and habit to reproduce them and without institutionally conditioned conceptual frameworks, an uncertain world would present a chaos of sense data in which it would be impossible for the agent to make sensible decisions and to act.

(Hodgson 1988: 205)

'Embeddedness' refers to the fact that economic action and outcomes, like all social action and outcomes, are affected by actors' dyadic relations and by the structure of the overall network of relations. The structural aspect is especially crucial to keep in mind because it is tempting to slip into the sort of 'dyadic reductionism' that is prevalent in Williamson's transaction-cost approach: the treatment of dyadic activity as if this were structured by the norms and interests entailed in the roles of buyer and seller. This treatment has the paradoxical effect of preserving atomized decision-making, even when decisions are seen to involve more than one individual. The analysed pair of individuals is abstracted out of social context; it is atomized in its behaviour from that of other actors and from the history of its own relations. Rather than eliminating atomization, this perspective merely transfers it to the dyadic level of analysis (Granovetter 1989: 8).

The embeddedness approach also avoids what might be called 'temporal reductionism'. 'Temporal reductionism' results basically

from a 'discrete view' of transactions (Macneil 1974) that focuses solely on the isolated act of exchange. Transactions are treated as if they had no history that could shape the present situation and as if 'the shadow of the future' (Axelrod 1984) – expected outcomes of future interactions – would not influence them. This volume puts forward a 'relational view' of transactions in order to overcome 'temporal reductionism'. Rather than being concentrated on the isolated act of exchange, this perspective is focused on the relation between the exchange partners. In ongoing relations, exchange partners do not start from scratch each day but rather from some set of previously attained common understandings – a point that was already clear to Durkheim when he wrote that

even where society rests wholly upon the division of labor, it does not resolve itself into a myriad of atoms juxtaposed together, between which only external and transitory contact can be established. The members are linked by ties that extend well beyond the very brief moment when the act of exchange is being accomplished.

(Durkheim 1893/1984: 173)

As in the embeddedness approach, the concept of social context in this volume is not one of a once-and-for-all influence but of an ongoing process that is continuously constructed and reconstructed during interaction. Economic actors neither behave as atomized individuals outside a social context nor adhere slavishly to unchangeable habits or norms. Consequently, opportunism, bounded rationality, and uncertainty – basic elements in Williamson's approach – are not treated simply as exogenous determinants of economic behaviour. Rather, they are seen as emerging in the course of exchange processes.

TERTIUM DATUR! BEYOND THE ARITHMOMORPHIC CONCEPTION OF MARKETS AND HIERARCHIES

In Williamson's dichotomous view of markets and hierarchies, the firm is clearly separated from markets or, more broadly, from the societal context. Competitors are outside the boundaries of firms, whereas managers exercise authority and curb opportunistic behaviour inside those boundaries. Fairly early on, Richardson (1972: 883) drew attention to the increasing involvement of firms in nonmarket arrangements with other firms and agencies: involvement that refutes the commonplace picture of firms simply as 'islands of planned coordination in a sea of market relations'.

In practice firms build wide and substantial barriers between themselves and such tempestuous seas by entering into all kinds of arrangements or deals with each other. They will often, for instance, make use of traditional ties of loyalty and use personal exchanges of goods or resources, rather than going to the open market and seeking one-off competitive deals.

(Hodgson 1988: 209)

In referring to those intermediate areas, Richardson hoped 'to show that the excluded phenomena in this case are of importance and that by looking at industrial reality in terms of a sharp dichotomy between firm and market we obtain a distorted view of how the system works' (Richardson 1972: 884).

Certainly, that is not to repeat the standard critique of Williamson's approach and to insist that reality is somewhat more complex than the crude dichotomy of markets and hierarchies. This critique is like forcing open doors because Williamson, like his intellectual fellow travellers, is 'now persuaded that transactions in the middle range are much more common' then he previously recognized (Williamson 1985: 83): *tertium datur* – there is a third case. According to Williamson, these 'transactions in the middle range' are elegantly arrayed within a continuum with the market exchanges at one end and hierarchies at the other. Moving from the market towards the hierarchy pole, one encounters putting-out systems, subcontracting arrangements, franchising, joint ventures, and decentralized profit centres. Explaining the existence of these intermediate forms usually involves cataloguing the deficiencies of fully integrated hierarchies and competitive markets and then arguing that the new intermediate forms solve these problems. These approaches rest on the premise that market and hierarchy are mutually exclusive means by which to govern transactions. In Georgescu-Roegen's words, markets and hierarchies are conceived as *arithmomorphic* concepts; that is, they are discretely distinct and do not overlap (Georgescu-Roegen 1971:45). Arithmomorphic concepts do not allow for those grey areas inherent in processes of evolution and change, in which concepts also contain elements of their opposite. No process of change can be completely decomposed into arithmomorphic parts, which are themselves devoid of change (Whitehead 1938: 131). To be sure, the drawing of boundaries – and analysis is nothing other than that – is a prerequisite for representing and understanding processes of change and the transition from A to non-A. However, persisting in sharp boundaries that inadequately disjoin interdependencies would be tantamount to 'scientific paralysis' (Georgescu-Roegen 1971: 206).

Hence, the arithmomorphic conception of markets and hierarchies masks the dynamics of economic and social changes. As Bradach and Eccles admit, 'the ideal types of market and hierarchy serve as a useful starting point for studying the organization of industry', but they also point to the weaknesses of this approach: 'The assumption that these mechanisms are mutually exclusive, however, obscures rather than clarifies our understanding. . . . [P]rice, authority, and trust are combined with each other in assorted ways in the empirical world' (Bradach and Eccles 1989: 116). Much of the complexity of combinations that Bradach and Eccles characterize as overlapping, intertwined, juxtaposed, and nested results because only occasionally are control mechanisms created on 'greenfield' sites. Typically, the various control mechanisms are grafted on to and leveraged off existing social structures. As Imai and Itami put it, 'market principles penetrate into the firm's resource allocation and organization principles creep into the market allocation' (Imai and Itami 1984: 285).

NETWORKS IN INDUSTRY: THE SOCIAL AND THE ECONOMIC IN PRACTICE

Rather than examine the firm as an analytically distinct *organizational* unit, the authors of this volume focus on the process of *organizing* in order to grasp the main features of this interpenetration of markets and hierarchies. After all,

the crucial strategic consideration for the modern-day firm is not choosing the 'best' hierarchical organizational form within the fixed boundary of the firm or choosing the 'best' mixture of internal production/outside purchase. Instead, the crucial consideration must be to build a social and economic context conducive to spontaneous and varied interactions of people inside and outside the firm. The boundary separating the interior and exterior . . . is not constant but is formed and continuously updated as a result of interactions.

(Imai 1989: 124)

This volume interrelates three of the most important forms of interpenetration of markets and hierarchies: the formation of cooperative relations within strategic alliances in high-technology fields (Part II), the disaggregation of and installation of price relations in hierarchically integrated large corporations (Part III), and the consolidation of former market relations in industrial districts (Part IV). So far, organizational developments in these three settings have mainly been analysed and discussed separately. The rather ambitious intention of this volume is to

interrelate socioeconomic analysis of each of these forms of mixing markets and hierarchies in order to demonstrate that they constitute a specific generic form of economic exchange: networks. Despite different organizational features, the network forms discussed in this volume share, at least, four basic features.

1 Reciprocity

In networks, economic transactions occur neither through discrete exchanges (as in markets) nor by administrative fiat (as in hierarchies). Rather, network forms of exchange entail indefinite, sequential transactions within the context of a general pattern of reciprocity. Reciprocity implies 'actions that are contingent on rewarding reactions from others and that cease when these expected reactions are not forthcoming' (Blau 1964: 6). Quite often, these obligations of one to another are implicit rather than explicit (Gouldner 1960). Reciprocity is a more general pattern of exchange than equivalence, which is supposed to govern market transactions, for contributions are not expected to reach balance in every single exchange act but rather over the entire exchange relation. Powell describes the different philosophy that undergirds exchange in markets and in networks:

In markets the standard strategy is to drive the hardest possible bargain in the immediate exchange. In networks, the preferred option is often one of creating indebtedness and reliance over the *long haul*. Each approach thus devalues the other: prosperous market traders would be viewed as petty and untrustworthy shysters in networks, while successful participants in networks who carried those practices into competitive markets would be viewed as naive and foolish.

(Powell 1990: 303; emphasis added)

2 Interdependence

A long-term perspective is also crucial for understanding a second basic feature of networks. Whereas the discrete exchange relations in markets allow for a high degree of *independence* of the individual actors, and the administrative fiat within hierarchies implies *dependence*, the stability of networks leads to *interdependence*. This interdependence of actors within networks results from processes of adaptation that follow a basic pattern as described by Blau:

Social exchange relations evolve in a slow process, starting with minor transactions in which little trust is required because little risk

is involved and in which both partners can prove their trustworthiness, enabling them to expand their relation and engage in major transactions.

(Blau 1968: 453)

Through mutual adaptations between the exchange partners, relations within the network are consolidated. As Macneil (1985) has suggested, the 'entangling strings' of reputation, friendship, and interdependence become integral parts of the relation, whereas a market contract 'connects two people only at the edges of their personalities' (Walzer 1983: 83). As a result of these processes of adaptation, disagreements emerging in the course of the exchange relations are resolved within the relation rather than by reorganizing relations. In Hirschmann's (1970) terms, 'voice' is preferred to 'exit' as a mechanism for conflict resolution.

Through interaction in the context of mutual adaptation, mutual orientation will evolve as well. This mutual orientation is manifested in a common language regarding technical matters, contracting rules, and standardization of processes, products, and routines. Less obvious aspects of the mutual orientation may involve views on business ethics, technical philosophy, and the handling of organizational problems. A mutual orientation – knowledge that the parties assume each has about the other and upon which they draw in communication and problem-solving – is essential (Johanson and Mattsson 1987: 339). This mutual orientation implies a set of more or less explicit rules that are formed, reinforced, and modified through interaction and – at the same time – that constitute the framework for subsequent interaction. In this sense, mutual adaptations result in a mutual – not necessarily symmetrical – 'framing' of decisions by which the structure of opportunities and constraints as well as their perception by the parties involved is shaped (see Håkansson and Johanson, chapter 2 of this volume; Semlinger, chapter 8). These rules also imply limits to opportunistic behaviour and thus save the costs of constructing and controlling contracts which, in pure market relations, control the opportunistic behaviour of exchange partners.

3 Loose coupling

However, these mutual processes of adaptation within networks do not culminate in vertical integration of exchange partners within a hierarchical firm. Rather, networks are aimed at benefiting – borrowing Granovetter's famous quip – from the 'strength of weak ties'. The loose

coupling (and therein networks differ from hierarchies) preserves some autonomy of the exchange partners and, hence, prevents them from being 'locked into' specific exchange relations (see Grabher, chapter 12 of this volume). As already demonstrated by Arrow (1974), increasing returns in the development and use of common codes and channels of information tend to make exchange partners less apt to respond when confronted with radical change in their environment. Sunk costs, reflecting investments made in codes and channels of information, introduce rigidities in the response to change. The loose coupling of exchange partners in networks implies a weaker form of rigidity. 'The relation does not necessarily involve any formal legal long-term obligations, but at the same time it constitutes a more or less stable framework for interaction and communication' (see Lundvall, chapter 3 of present volume, p. 56).

Hence, loose coupling within networks affords for favourable conditions for interactive learning and innovation. Networks open access to various sources of information and thus offer a considerably broader learning interface than is the case with hierarchical firms. In allowing for ambiguity in the perceptions and orientations of the individual exchange partners, networks are particularly adept at generating new interpretations and innovations. In a sense, loose coupling constitutes a fund of cultural insurance upon which networks can draw in times of radical change. 'In loosely coupled systems where the identity, uniqueness, and separateness of elements is preserved, the system potentially can retain a greater number of solutions than would be the case with a tightly coupled system' (Weick 1976: 7). Loose coupling, thus, also reduces the risks of cumulative misjudgements and of 'wrong learning' based on positive feedback-loops (Masuch 1985).

The open-ended, relational features of networks greatly enhance the ability to transmit and learn new knowledge that cannot easily be traded in markets. This is especially true when it comes to an exchange of highly sophisticated technological knowledge that is tacit in character and difficult to codify (Nelson and Winter 1982). The relative absence of explicit *quid pro quo* behaviour prevailing in market relations is highly conducive for interactive learning, which is essential in innovation processes. As Lundvall convincingly demonstrates (see chapter 3 of present volume), interactive learning presupposes an orientation to 'communicative rationality' – that is, an orientation to understanding which transcends the narrow market calculus of minimizing transaction costs.

Finally, loose coupling provides for redundancy, which has a similar function at the level of the network as 'organizational slack' has at the

level of the individual firm, that is to 'absorb a substantial share of the potential variability in the firm's environment' (Cyert and March 1963: 38). Networks are provided with a systemic externality which hierarchically integrated firms normally do not have. Unless they are linked to a network of other firms, they cannot use other firms as capacity reservoir in order to smooth their production requirements. In networks, the 'slack' that would remain unused in the case of an integrated firm is pooled and redistributed among different firms (see Grabher, chapter 12 of this volume).

4 Power

The mutuality in the processes of adaptation and framing decisions, however, must not be confused with symmetry. It is inaccurate and misleading to characterize networks solely in terms of harmonious collaboration and concord, as is euphemistically done in some of the recent management literature on 'partnerships'. Each contact in a network relation can be a source of conflict as well as of concurrence. Keohane has stressed that processes of reciprocity or cooperation in no way 'insulate practitioners from considerations of power' (Keohane 1986: 8). Moreover, Håkansson and Johanson (see chapter 2 of this book) conceive of power even as a functional element of networks: 'In contrast to the market model, in which power is seen as some kind of imperfection, the network model views power as a necessary ingredient in exploiting . . . interdependencies' (p. 48). At least temporarily, this exploitation of interdependencies may be asymmetrical because the more powerful economic actors are able to 'frame' decisions by which the constraints and opportunities of their exchange partners are shaped. For example, asymmetry is essential for large customer firms seeking to shape the relations with their suppliers (see, in present volume, Helper, chapter 7; Semlinger, chapter 8).

Power – and its distribution within networks – also becomes particularly clear when existing network relations are radically reorganized. Such a reorganization of network relations, in most cases, reflects the attempts of powerful actors to shift to promising new markets by tapping into the innovation resources of new cooperating partners (see Kogut, Shan, and Walker, chapter 4 of present volume) and by terminating old cooperative relations (see Grabher, chapter 12 of present book). Power in networks is also unmasked when newcomers are barred from access either explicitly or, more subtly, through such barriers as unwritten rules or informal codes of conduct. The difficulties of western competitors in entering

the Japanese market, to name a prominent example, have often been attributed to subtle and informal codes of conduct which, deeply rooted as they are in the Japanese tradition, have made for the almost impenetrable cohesiveness of Japan's industrial networks (Orru, Hamilton, and Suzuki 1989).

HIGH-TECHNOLOGY NETWORKS: HORIZONTAL INTERFIRM COOPERATION AND STRATEGIC ALLIANCES

Strategic alliances are, in many respects, not new organizational arrangements in principle. However, their importance and substance seem to have changed considerably during the 1980s, when experimentation with various kinds of strategic alliances – such as joint ventures, equity investments, research pacts, and licensing agreements – increased in an unprecedented fashion (Hergert and Morris 1988; Mowery 1988; Hagedoorn, chapter 6 of present volume). Traditionally, strategic alliances were particularly prevalent in extractive industries and were often resorted to when political exigencies or protectionist policies prevented the operation of fully owned subsidiaries in foreign countries (Stopford and Wells 1972). However, as the empirical overview by Hagedoorn (see chapter 6 of this book) indicates, the considerable increase of strategic alliances during the 1980s has been attributed mainly to new and technology-intensive industries. Of all strategic alliances covered by his survey, more than 70 per cent were in the fields of information technology (41.2 per cent), biotechnology (20.2 per cent), and new materials (10.3 per cent).

In the past, a common way for large companies to gain expertise that they were unable to develop on their own was to acquire another company with the needed capability. However, the track record of mergers and acquisitions in high-technology fields has been generally poor in recent years (Doz 1988). Strategic alliances are now becoming more frequent because of a growing awareness of the drawbacks of these more traditional forms of acquiring know-how. Above all, these drawbacks refer to the high risks involved in an outright takeover of firms engaged in high technology. These particularly volatile fields are characterized by high uncertainties about whether a specific new technology will be feasible or whether it can be produced profitably (Chesnais 1988).

Strategic alliances benefit from the merits of 'loose coupling' within network forms of cooperation. They allow for quick access to expertise that cannot be produced internally without binding a firm's destiny too closely to the unforeseeable development of the cooperating partner;

they are a means of pooling complementary assets and competences without abrogating the separate identity and personality of the cooperating partners. Thus, strategic alliances sustain the conditions for further innovation by bringing together different logics and novel combinations of information (Kaneko and Imai 1987). Whereas acquisitions regularly lead to a 'mashing' of the different corporate cultures, the loose coupling within strategic alliances preserves the identity and separateness of the cooperating partners (Ohmae 1989). This is especially crucial in the cooperation between large corporations and start-up firms. An excessively tight integration of the small firms would undermine their comparative strengths, which are based on their flexibility and their 'hot-house' atmosphere (Doz 1988).

The increase in the number of strategic alliances is also related to certain general trends in market and technological development (Contractor and Lorange 1988; Howells 1990; Mansfield 1991). First, the shortening of the innovation period increasingly overextends the scope or capability of a single organization and thus promotes strategic alliances, in which the firm shares the burden ensuing from the contraction of the development phase for new products. Second, there is an increasing need for advanced technology transfer in cases where converging technologies involve complementary technology (Camagni 1991: 137). Often, the development of a specific technology can be pushed ahead only if an additional technology is mastered. A third and closely related reason why the increase in strategic alliances is related to general trends in the development of the market and technology is that 'the present wave of technological innovation is less the application of separate inventions than the integration of a variety of different new products and processes into new systems' (Van Tulder and Junne 1988: 219). This increased demand for system integration acts as a stimulus for cooperation with other firms, either to produce a common system jointly or, as in the case of the semiconductor industry, to establish a common standard (David 1987). Fourth, strategic alliances are also a means to monitor the evolution of new technological opportunities. In this sense, strategic alliances open a 'window on technology' (Faulkner and Orsenigo 1991).

However, strategic alliances cannot be conceived of exclusively as elements of an 'offensive' strategy aimed at innovations at the leading edge of technology. Rather, as Benassi (chapter 5 of present volume) suggests, strategic alliances may also be 'defensive' in nature. Establishing external ties with a cooperating firm is a way in which firms strengthen internal ties, especially when several internal units perform similar tasks. Such defensive strategic alliances are particularly im-

plemented by large multiproduct firms after merger and acquisition processes that lead to a duplication of resources and capacities. Cooperation with a third party may help outflank internal inertia and counterbalance internal pressures and preferences and may thus facilitate internal restructuring.

Typically, strategic alliances involve two types of organizations. In one type, large companies join together with other large companies, particularly in international joint ventures. Cases in point are the widely ramified cooperative agreements between the world's largest automobile producers. In the other type, strategic alliances are aimed at benefiting from the 'dynamic complementarities' (Rothwell 1989) of large and small firms. This pattern is of particular relevance in the biotechnology industry, where large chemical corporations that have financial and marketing power link up with business start-ups and small firms that possess entrepreneurial commitment and expertise in the new field of biotechnology (Olleros and Macdonald 1988: 167). These two patterns of cooperation contribute, in a complementary fashion, to the process of firm and industry globalization. Whereas cooperation with start-ups tends to be largely a national affair, national networks are tied together through the cooperation between large firms (Castells and Henderson 1987). Thus, the emerging global strategic alliances shift the very basis of competition to a new level – from firm versus firm to rival transnational groupings of collaborators that are able to exploit the differentiated capabilities of various regional and national networks (Lovering 1988).

In each of these networks, there is a specific structure of information regarding the locus of capabilities, whether it be financial, productive, or scientific. In this sense, national and regional networks are themselves 'an expression of social knowledge':

The competitive strengths of a company lie partly in the nature of its relations with other firms and institutions. Firms build up over time unique assets in terms of knowing where to find certain technologies or buyers, how to cooperate for the development of new products, or whom to fund in external university-based research centres.

(Kogut, Shan, and Walker, chapter 4 of present volume, p. 77)

Nowhere is this clearer than in the peculiar American proclivity towards entrepreneurial firms in high-technology industries. In biotechnology, for example, American start-ups outnumber European ventures more than 5 to 1; only a few Japanese start-ups can be identified. This also explains the international pattern of strategic

alliances in biotechnology, where American firms have acted as the principal pole of cooperative activity.

Certainly, this is not to repeat the all-too-straight-lined stories in the business literature that explain the emergence of these patterns of strategic alliances in terms of comparative advantages – whether of firms, regions, or nations – that are smoothly matched by market forces. Rather, and here 'embeddedness' enters the picture again, cooperating partners must find one another in a world of incomplete information, and this process of search is largely influenced by their primary relations with other firms as well as by the relations of other firms to one another. In almost half the strategic alliances analysed by Benassi (chapter 5 of present volume, p. 105), 'long-term personal knowledge between key actors . . . was the spark that ignited subsequent relations between firms'. Information on potential cooperating partners is determined by previous personal relations and, in turn, influences the subsequent propensity to enter into additional relations. This is also shown by Kogut, Shan, and Walker (chapter 4 of present volume, p. 70), who found 'that the degree to which a firm belongs to a cohesive group leads to an increase in subsequent relations. Better information reduces search costs and also heightens imitative pressures. As a result, more information leads to more relations.'

This strong reliance on mutual personal knowledge mirrors the fact that strategic alliances can only partially be developed and controlled through formal agreements (Borys and Jemison 1989). Strategic alliances, which are not seldom based on an equity stake below 10 per cent, thus presuppose a break with the tradition 'that has long taught managers the dangerous arithmetic that equates 51% with 100% and 49% with 0%' (Ohmae 1989: 148). Collaborative research, or the cooperative development of new products, which often involves the transfer of tacit and intangible knowledge, cannot easily be managed by the traditional means of control by ownership (Jain and Triandis 1990), since 'coordination is only possible through influence, not through hierarchy' (Benassi, chapter 5 of present volume, p. 111). Rather, these collaborative ventures require of the cooperating partners a minimum of trust and mutual commitment which results from previous personal experience. In this sense, the embeddedness of strategic alliances within personal relations must not simply be conceived of as an irrational and frictional drag to proper economic behaviour. Rather, it plays a highly functional role in providing a basis for choosing partners and shaping expectations of future cooperation.

SUPPLIER NETWORKS: VERTICAL INTERFIRM COOPERATION AND DISAGGREGATION OF LARGE FIRMS

The unprecedented mushrooming of strategic alliances has been attributed to, among other things, the attempts of firms to reduce risks. Interestingly, in an earlier era, firms actively pursued a strategy of vertical integration in an effort to reap the benefits of risk reduction, together with those of administrative coordination and economies of scale (Chandler 1977). This strategy of vertical integration culminated in Ford Motor Company's fully integrated 'behemoth at River Rouge', supplied by an empire that included ore lands, coal mines, 70,000 acres of timberland, saw mills, blast furnaces, glass works, ore and coal barges, and a railway (Williamson 1985: 119). This strategy of vertical integration was highly successful 'when the pace of technological change was relatively slow, production processes were well understood and standardized, and production runs turned out large numbers of similar products' (Powell 1990: 319). Today, however, such large-scale vertical integration has serious weaknesses: inability to respond quickly to competitive changes in international markets; resistance to process innovations that alter the relation between different stages of the production process; and relative lack of willingness to introduce new products (Mariotti and Cainarca 1986).

The weaknesses of vertical integration cause firms to reduce the share of in-house production and to rely increasingly on external suppliers. Industrial researchers and practitioners no longer make a pilgrimage to the 'behemoth at River Rouge' but to Japanese corporations that produce only a small share of the products' components in-house while the vast bulk is supplied by a dense network of subcontractors. In a sense, the Japanese corporations are conceived of as the forerunners of a strategy that marks a distinct renunciation of vertical integration. The Japanese automobile industry, for example, produces only about 30 per cent of its car components in-house, as compared to 45 per cent in the European and about 70 per cent in the US automobile industry (Ikeda 1988).

Along one route, the strategy of vertical disaggregation leads firms to a rediscovery of the market, to arm's-length contracting relations with outside suppliers. The greater reliance on market contracts is usually associated with strong efforts at cost-cutting and risk externalization (Harrison and Kelley 1990). Another route leads firms to network relations with supplier and cooperating firms that go far beyond exchanges properly specified in market contracts. At first glance, the

simultaneity of these different efforts at vertical disaggregation appears to make them work at cross-purposes:

Some firms are seeking new collaborative alliances with part suppliers while at the same time they are trying to stimulate competition among various corporate divisions and between corporate units and outside suppliers. Firms are proposing new cooperative relationships with labor unions and in the same motion reducing jobs and outsourcing them to foreign producers.

(Powell 1990: 321)

At second glance, however, a theme underlying both of these attempts does appear. As evidence from the automobile industry suggests, this theme seems to boil down to a pyramidal structure of subcontracting relations (Demes 1989; Kosaka 1989). The first tier of the pyramid consists of networks of a small number of 'preferred-status' suppliers, which are able to invest massively in joint research and joint design work and which are able to deliver pre-assembled components. Typically, these preferred-status suppliers enjoy stable relations with their customers, relations based on long-term contracts and single-sourcing agreements. In keeping with the general logic of networks, customer response to problems arising in the relation with a first-tier supplier is 'voice', that is, the practice of working with the original supplier until the problem is corrected. Such a voice-based strategy towards suppliers presupposes a high degree of information exchange. Maintaining this degree of information flow both requires and engenders a high degree of commitment to the relation (Buckley and Casson 1988: 35), a commitment that acts as an important stimulus for innovative activity (Von Hippel 1988). As indicated by results of a 1989 survey of US automotive suppliers, high commitment – as measured by contract length and degree of trust in the customer – is significantly related to investment in automation. Helper's analysis of this data (see chapter 7 of present volume) shows, for example, that the percentage of firms that apply computer numerically controlled (CNC) machine tools increases considerably as contracts lengthen: before firms make large investments, they want to have some assurance that they will have enough work to cover their additional fixed costs.

However, evidence from the automobile industry (see Helper, chapter 7 of present volume) as well as studies of high-technology industries (see Kogut, Shan, and Walker, chapter 4 of this book) and the coal, iron, and steel industry (see Grabher, chapter 12) indicate that too much commitment can reduce innovative activity and lock customers

and suppliers into a specific technological trajectory. High commitment may result in a homogeneous world view that precludes competing perceptions and interpretations of information. In order to avoid such a lock-in and to benefit from the adaptiveness of loose coupling, major Japanese customer firms encourage their first-tier suppliers to diversify into markets that are potentially relevant for their own core activities (Small and Medium Enterprise Agency 1989). These diversification activities of the suppliers are conceived of as an 'antenna function' (Van Kooij 1991: 152) which ensures the openness of the first-tier subcontracting network to new technological opportunities.

This sort of 'collaborative manufacturing' (Sabel, Kern, and Herrigel 1991) within the subcontracting networks of the first-tier suppliers is typically restricted to large and medium-sized firms with a rather strong market position and a high level of technical competence. With increasing distance from the peak of the pyramid, however, the market position of the suppliers drastically weakens, the technological level declines, firm size decreases, and the scope of tasks of the suppliers becomes smaller (Ikeda 1988). The bottom of the supplier pyramid is made up of small sweatshops which are ready to submit to outside pressures and accept long-term risks and cutbacks to existing firm goals. Their 'passive pliability' is very different from the 'active versatility' for which small firms are commonly celebrated (see Semlinger, chapter 8 of present volume). A good deal of this passive pliability of small supplier firms derives from the variability of their personnel capacity. Many small supplier firms employ a relatively large share of temporary and family workers who are prepared to agree to nonstandard working hours and conditions and to casual work.

In contrast to the network relations in the first tier of the supply pyramid, relations between customers and these small suppliers in the lower tiers increasingly resemble arm's-length market contracting as one moves away from the peak. In the lower tiers, suppliers are played off against one another in cut-throat price competition (Harrison and Kelley 1990). In these highly price-competitive tiers of the supply pyramid, the customer's response to problems with suppliers is 'exit', that is, to find a new supplier. Such exit-based cost minimization prevailed in the US automobile industry up to the 1980s. Contracts were lost because a supplier bid a tenth of a cent per item higher than a competitor (Porter 1983). It is also in the US automobile industry where the short-term logic of price-competitive suppliers has revealed its long-term weaknesses (see Helper, chapter 7 of this volume). The need to compete with low-overhead suppliers of existing products – who continued to produce as long as price exceeded marginal costs –

hindered other firms from upgrading their equipment, from improving their products, and from making long-range plans. This circumstance also made it difficult for them to develop any nonautomotive contracts that would have been essential for incorporating new technologies. Hence, the exit-based price competition triggered a vicious circle which undermined the innovative abilities of the entire sector.

The current attempts of US automobile firms to move, at least partially, towards adopting a voice-based strategy with some of their suppliers are instructive in two ways. First, these attempts demonstrate that the specific mode of exchange is not – as transaction-cost analysis suggests – determined in a unidimensional way by exogenously given 'human factors', such as bounded rationality and opportunism, or by 'environmental conditions', such as asset specificity and uncertainty. Rather, powerful customers are able to influence these factors and conditions and, hence, are able to choose among different modes of exchange (Amendola and Bruno 1990: 426). For example, large customers in the US automobile industry are now reducing the level of uncertainty and opportunism by extending the time-span of contractual agreements and improving the flow of information. In a similar way, they are increasing the level of asset specificity by contracting-out entire components and not – as in past decades – simply easy-to-produce pieces of it. Both of these choices favour a shift from market to network-type relations between customers and suppliers. The second thing that is instructive about the partial switch that US automobile firms are making from exit to voice-based strategies, from market to network, is that it is neither easy to achieve nor costless for customers and suppliers. The customers must do more 'than just change the relative prices of innovation and other desired supplier actions. They must also change a relation – incentive structures, expectations, and capabilities that have become "embedded" in the system over decades' (Helper, chapter 7 of present volume, p. 150).

These problems of switching modes of economic exchange, however, pale into insignificance against the difficulties the Central and Eastern European countries face in decomposing their highly vertically integrated combines. The unparalleled high degree of vertical integration in Central and Eastern Europe reflected, on the one hand, the attempts of the central planning authorities to enhance coordination and control of the various steps of production. On the other hand, the individual combines strove for autarky in order to replace unreliable suppliers (see Neumann, chapter 9 of this volume). The decomposition of these combines and the reduction of the breath-taking ratio of in-house production, which are now on top of the reform agenda, cannot

simply be reduced to a transformation of hierarchical into market relations. The former state socialist economies corresponded with textbook models of *planned* economies about as much as western economies matched textbook models of *market* economies. In Central and Eastern Europe, resources were not completely allocated according to the hierarchical principles of a central plan. In addition, networks within and between combines emerged that were aimed at compensating for the chronic shortages of raw material, equipment, and spare parts. Whereas these networks in some Eastern European countries (e.g., in the former GDR) have been tacitly tolerated, in others (above all, Hungary) they have been explicitly supported by the state. However, as research on Hungary suggests, these networks will hardly be able to provide the economic infrastructure for the decomposition of the large, vertically integrated combines. For too long a period of time, it seems, they have been restricted to a mere ancillary function which prevented them from developing innovative capabilities (Gabor 1990; Stark 1990; Neumann, chapter 9 of present volume).

REGIONAL NETWORKS: MULTIDIMENSIONAL INTERFIRM COOPERATION IN INDUSTRIAL DISTRICTS

Vertical disaggregation is also expected to have a profound impact on the map of industrial production (Scott and Storper 1991; Moulaert and Swyngedouw 1991). In a fundamental observation, Scott identifies 'the tendency for internal economies to give way before a progressive externalisation of the structure of production under conditions of rising flexibility, [which] leads at once to a revival of proclivities to locational convergence and reagglomeration' (Scott 1988: 175). According to this view, increasing demands on flexibility, which are caused by continuing instability of markets and an accelerated pace of technological change, led to a reaffirmation 'of place as the foundation for efficient and effective production apparatuses' (Storper and Scott 1989: 37). The first conspicuous case, which was treated almost as proof of the thesis of a 'renaissance of regional economies' (Sabel 1989) was the Third Italy, consisting of the regional small-firm networks in the provinces of Emilia-Romagna, Tuscany, the Marche, Abruzzi, and Veneto.

The resilience and growth of these highly competitive regional networks in the Third Italy has recently been explained increasingly in terms of the deliberations of Alfred Marshall (1890/1961: 267-77) on the 'concentration of specialised industries in particular localities'. He emphasized the role of external economies of scale deriving from the division of tasks in an industry among many producers. In fact,

with regard to many classes of commodities it is possible to divide the process of production into several stages, each of which can be performed with the maximum of economy in a small establishment. . . . If there exist a large number of such small establishments specialised for the performance of a particular stage of the process of production, there will be room for the profitable investment of capital in the organising of subsidiary industries adapted for meeting their special wants.

(Marshall 1919/1927: 196)

However, he also referred to the benefits deriving from the 'embeddedness' of networks of these specialized establishments within localities with a specific 'industrial atmosphere' – benefits such as the easy exchange of ideas, information, and goods; the accumulation of skills and innovative capability; and the development of a cultural homogeneity allowing cooperation, trust, and consensus among employers, among workers, and between both groups.

Marshall's rationale comes very close to explaining the contemporary dynamics of areas in the Third Italy, in which each network of small firms, reliant upon a design and innovation-intensive craft tradition, specializes in the production of a particular good for sale to quality-discerning consumers. The affinities seem to be so close that the term 'Marshallian industrial districts' has been coined to capture the essence of these localities in Italy (Becattini 1989, 1990; Bellandi 1989; Sforzi 1990). Although there are significant differences between them in terms of their origins and their consolidation as industrial districts (Pezzini 1989; Camagni and Capello 1988), case studies of Modena, the 'microcosm of Latin Europe's renaissance' (Powell 1990: 310), instructively illustrate the main features of Italian Marshallian industrial districts (Brusco 1982; Lazerson, chapter 10 of present volume).

Most of Modena's firms are extremely small and are grouped in specific vicinities according to their product. About 90 per cent of Modena's knitwear firms, for example, have less than 20 workers and are located in the vicinity of Carpi (see Lazerson, chapter 10 of present volume, p. 204). Production is conducted through extensive, collaborative, subcontracting agreements. The widespread network of putting-out in Modena defies industrial development theory in which the idea that putting-out in the advanced countries has been permanently overtaken by hierarchical organization within a firm because of the inadequate supervision, poor workmanship, pervasive theft, and spasmodic coordination of putting-out (Landes 1969). The new institutional economists represented by Williamson (1980, 1985) and North (1981)

insist that the firm is simply more efficient because it limits opportunistic behaviour through external control. Moreover, they also argue that one long-term cost of the 'weak decision-making hierarchy' common to putting-out systems is less innovation (Williamson 1980: 23). The claim is that although artisans may devote resources to innovations that reduce labour costs, attempts to reduce material costs would certainly not be a concern of theirs because these expenses are borne wholly by manufacturers.

However, the portrait of Modena as one of the richest and most innovative provinces in Italy (Brusco 1982) sharply contrasts with these theoretical expectations. The structural deficiencies of putting-out and of smallness seem to be largely mitigated by the supportive tissue of social practices and institutions that constitute the Marshallian industrial districts. First, loose coupling provides for redundancy that allows a small firm to use other firms of the industrial district as capacity reservoir to smooth its production requirements. In fact, 'a firm with excess capacity can always add some "corporations" to the set of those it is already serving. And one with insufficient capacity can always ask a subcontractor to meet its excess production requirements' (Inzerilli 1990: 14). This systemic externality, of course, may apply not only to production capacity but also to other resources such as R&D and marketing (Dei Ottati 1991).

Second, Modena has been able to gain the cooperation of local authorities, trade unions, and voluntary craft associations in discouraging the destructive forms of capitalist competition that have been common in southern Italy, where sweatshop abuses among putting-out workers are widespread (Amin 1989). Above all, the Confederation of Artisans (CNA) aims to enforce a virtuous circle where process and product innovations are continually encouraged to avoid the vicious circle of ruthless competition, achieved through tax evasion and violations of labour laws and the collective labour contract (Best 1990; Brusco and Pezzini 1990).

Finally, Modena's 'homogeneous culture creates rules and engenders trust, and its geographic boundedness increases the probabilities of social interaction and communication that reduce the problem of bounded rationality' (Lazerson, chapter 10 of this volume, pp. 214–15). The tight relations between firms, embedded in ties of extended families and friendship, facilitate the search for new employees but also entails that 'the secrets of the industry are in the air' (Becattini 1990: 42).

The pioneering research on Modena and neighbouring industrial districts triggered an explosion of regional case studies, also far beyond the Italian border, that soon led to a patchwork-like, world-spanning

map of regional economies. This map includes localities as different as the craft-based regional economies of Baden-Württemberg in Germany (machine tools, automobile components, textiles), Jutland in Denmark (textiles, furniture, machine tools), and Småland in Sweden (metal-working) on the one hand, and young high-technology regions like Silicon Valley, Orange County, or Route 128 circling Boston on the other hand. Without engaging in definitional sophistry, the vehement controversy about which localities deserve the label 'industrial district' (Pyke, Becattini, and Sengenberger 1990: 220–37) at least implicitly bears out the importance of embeddedness. Despite decisive historical, structural, and spatial differences (Gordon 1991: 180–5), these localities undoubtedly have substantial affinities to the Italian industrial districts that embody the principles identified by Marshall. However, and equally beyond doubt, the specific social structure and division of labour that constitute the backbone of the Third Italy are not reproducible elsewhere (Amin and Robins 1990). In fact, if there were a possibility of arbitrarily producing carbon copies of the Third Italy anywhere, there would not be much sense in writing a book on embeddedness. In other words, it appears more interesting from a theoretical perspective and more fruitful from a practical point of view to discuss *why* these localities differ rather than arguing the case why certain regions should be included or excluded from the map of industrial districts.

LIMITS OF NETWORKS: PROBLEMS WITH EMBEDDEDNESS

It would be tempting to stop here and restrict this introduction to a catalogue of those features in which networks are superior both to fully integrated hierarchies and to competitive markets. This would surely contribute to a mystification of networks as a new master paradigm and a universally applicable blueprint for economic success. However, it would also require us to pass elegantly over potential deficiencies of networks that several contributions in this volume point to implicitly or explicitly. In the research covered by this volume, the social embeddedness of networks is perceived as a major reason for their uncontested responsiveness and ability to generate incremental innovations. With respect to major changes, however, the role played by the social embeddedness of networks is not clear. Especially, but not exclusively, research on regional networks unveils an 'embeddedness dilemma' which probably also marks the limits of networking.

First, the decline of regional economies to which Marshall referred

in his reflections on industrial districts can be traced back, at least partially, to a rather high degree of embeddedness (see Grabher, chapter 12 of this book). A case in point is the regional development of the Ruhr area which became locked into a homogeneous regional culture. This homogeneity was reinforced by social processes such as 'groupthink' (Morgan 1986) and resulted in a common world view which precluded competing perceptions and interpretations of information. The high degree of personal cohesion led to a limited perception of innovation opportunities and left no room for 'bridging relations': those that transcend a firm's own narrowly circumscribed group and bring together information from different sources (Wegener 1987: 28). In this sense, the strongly embedded regional networks insidiously turned from ties that bind into ties that blind. Also the close relations between industry, the regional government, associations, and supportive institutions increasingly petrified and perverted into coalitions against economic, political, and cultural innovation.

Clearly, this brief reference to the decline of the Ruhr does not suggest any sort of determinism that would imply a similar destiny for the industrial districts of today. However, the view of Marshall, who was extremely conscious of the problems caused by homogeneity and 'the evil of one-sided dependence', may be too optimistic:

[A]lthough even a little obstinacy or inertia may ruin an old home of industry whose conditions are changing, and although the opening out of new sources of supply or new markets for sale may quickly overbear the strength which old districts have inherited from past conditions; yet history shows that a strong centre of specialised industry often attracts much new shrewd energy to supplement that of native origin, and is thus able to expand and maintain its lead.

(Marshall 1919/1927: 287)

In the case of the Italian industrial districts, however, some rather superficial observations could be interpreted as potential threats to their lead. Innovation in the Italian industrial districts seems to be concerned primarily with improvements along their traditional technological trajectory rather than with major product developments (Bianchi, forthcoming). The cultural coherence and corporatist relations at the local level (Trigilia 1989) may, in the long run, also give rise to inertia which restricts major changes.

Second, industrial districts may also be exposed to an insidious erosion of their specific supportive tissue of social practices and institutions which, in the final analysis, results in a reduction of their social embeddedness. This second potential threat results from the strategies of

large corporations who, while decentralizing their internal structure, aim at benefiting from the specific strengths of industrial districts (see Amin, chapter 13 of present volume). As Herrigel's analysis (see chapter 11) of Baden-Württemberg suggests, these strategies 'to make the most of local traditions' (Poittier 1988: 117) most probably do not lead to a smooth 'mutual convergence' (Sabel 1989) between attempts of large corporations to decentralize and the consolidation of regional networks; nor do they lead to a simple integration of regional networks within the large corporation's hierarchy (Harrison 1989). The picture emerging from Herrigel's analysis appears to be more complex.

On the one hand, people of the 'traditionalist faction' within the management of large corporations advocate a continuation of their practice of using smaller firms as spot subcontractors to gain price advantages and flexibility. Ironically, the traditionalist strategy seems less problematic for the industrial districts than does the strategy of the 'transformers', who, on the other hand, are deliberately seeking to integrate themselves into the industrial district by entering into highly iterated collaborative interactions with firms of the regional network. In order to benefit from the innovative potential of these networks, the large corporation has to achieve at least a minimum of organizational compatibility with the networks and transparency within them. For the large corporation, compatibility of organization and management styles seems imperative if transaction costs are to be reduced (see Semlinger, chapter 8 of present volume). And transparency is a precondition for the identification of information flows and, hence, for streamlining relations within the regional networks. Such an 'imperialism of instrumental rationality' (Malsch 1987), however, may lead into a 'modernization trap'. Achieving organizational compatibility and transparency will lower transaction costs but most probably will also reduce the social embeddedness of industrial districts on which their flexibility and innovative abilities were based. For the moment at least, there are reasons to doubt that the industrial districts will remain masters of their own destiny and will be able to preserve their specific supportive tissue of social practices and institutions against an insidious erosion through large corporations (see Amin, chapter 13 of this book).

These speculations on the future of industrial districts may appear rather heretical against the background of their current economic success and their still-euphoric perception in scientific circles. However, they elucidate a potential dilemma concerning the embeddedness of networks. Too little embeddedness may expose networks to an erosion of their supportive tissue of social practices and institutions. Too much embeddedness, however, may promote a petrification of this

supportive tissue and, hence, may pervert networks into cohesive coalitions against more radical innovations. To be sure, this simple contrasting of 'too much' and 'too little' embeddedness is satisfying from neither a practical nor a theoretical point of view, and must not be confused with an implicit suggestion that future research should clarify the proper or 'optimal' amount of embeddedness. A much more promising task for future research appears to be the identification of factors that foster either an erosion or a lock-in of networks. This would require an identification of those socioeconomic moving forces that disturb the fragile balance within networks between reciprocity and power, between interdependence and loose coupling.

Such an attempt, however, calls for an approach that fundamentally differs from that of the photographer in *Blow Up*. Instead of enlarging the photograph in order to identify the individual grain, the appropriate methodology for this task would be to prolong the exposure time. Admittedly, that method leads to blurred images, but it also unveils the moving forces that are essential for understanding the dynamic processes within the picture.

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