

The Spread of Cooperative Attitudes among Small Firms with Different Territorial Backgrounds: The Case of Northern Italy

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Some willingness to forgo selfish advantage, some element of genuine trust between trading partners or among business associates, almost always remains a necessity in the world of affairs (Hirshleifer 1985:18).

The development of industrial systems by external networks is a trend characterizing the present stage of capitalism. This phenomenon is supported by abundant empirical material as well as by comprehensible theoretical reasons.¹ Like all phenomena of innovation—in this case behavioural—such a trend has its own paths of diffusion, largely dependent on the numerous distinctive characteristics of the subjects forming these networks. Among these characteristics, connections with the world of science and research (science-based or research-intensive firms), market size, and, not least, the environmental setting of the subjects are highly significant.

This article looks at the latter characteristic, identifying a number of territorial factors differentiated from what has been

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1. The theory of cooperation among firms is based on the composite approach introducing two basic innovations as compared with neoclassical economic theory. The first innovation is recognition that the market is not the only institution governing the exchange of goods (in the contractual form of purchase and sale). The second is that firms adopt production organizations and contractual patterns that minimize transaction costs, it being explicit here that every exchange has its cost: the cost of "market use".

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defined as the "network approach" in the relations among firms and stressing those factors that act to facilitate or hinder such tendencies. The survey set out here begins by describing the emergence of an economy of non-competitive relationships among firms and its expansion even among small firms. This is followed by an analysis of both the opportunities and restraints that small firms face in this process and the role played by the environment. This emphasis means explicit introduction of a spatial dimension into a debate that arises outside the territorial sphere. The article concludes by verifying the existence of spatially differentiated attitudes in the formation of networks of firms—attitudes that, to a large extent, can be traced to the stimuli offered and the pressures exerted by a specific local environment.

Numerous recent articles and books (Di Bernardo and Rullani 1985; Bressand et al. 1989) have stressed the significance that technological change has had and is still having for the business economy (here understood in the dual meaning of the rules for individual firm management and the overall rules for the description and interpretation of the industrial system).

Against this background, "network systems" are establishing themselves as a formula for governing and dominating the play of international competition during the 1990s (Lorenzoni 1990; Bressand et al. 1989; Camagni 1991). The interesting aspect of the new network pattern—profoundly different from the stage of all-out vertical integration—is that each separate firm, no matter its size, has this possibility. The developments of recent years have also shown that no level of concentration is capable of replacing either the network or the strategic alliance (Contractor and Lorange 1988; L'Impresa 1989). It is precisely from the largest size establishment—the great multinational undertaking—that the clearest signals of the advent of this approach to global markets have originated.

Non-competitive Relationships and Small Firms: Opportunities and Restraints

For small firms,² which by definition have limited resources, opting for development through "external networks" appears to be particularly attractive—indeed, a mode of operation that will meet the new

2. Within the context of the Italian industrial system, the term *small firm* is used here to indicate individual firms with fewer than 250-300 employees. According to business organization studies, that is the largest firm in terms of human resources that can be run by an individual entrepreneur. Any firm having more than 300 employees must be organized in a managerial fashion.

requirements of flexibility and globality without forcing the individual firm to lose its identity.

Even though theorists (Lassini 1985; Lassini and Mariti 1991) have yet to discover satisfactory arrangements of the economy of inter-firm collaboration among small manufacturing firms (SMFs), observation of the relationships being tried by such firms nonetheless shows, in reality, a number of forms of expression directed in some way toward ensuring an effective structure of relationships with other economic subjects—whether they be customers, suppliers, financiers, or even the social and cultural environment in which the firm operates. For the innovation element, as compared to counterposed "vertical integration" or "productive decentralization", the complex of interindustrial relations and organizational interconnections cannot be confused with the sum or the complex of subjects that bring it into being; one system is in fact made up of the sum of its parts and the relations among them.

Moreover, the empirical repercussions of the recognized importance of such agreements are on the rise even in small firms (Lassini 1985; IReR 1988; Bramanti 1989; CEDOC 1990). Nevertheless, these firms still clash with attitudes partly shaped by fear of involvement, dread of being overwhelmed, and an inability to evaluate costs and benefits.

The empirical literature available on cooperative agreements and strategic alliances among firms points to the following observations:

- The most frequently involved subjects are the so-called high-tech and research-based firms.
- The objects of the agreements (or at least of their central part) are mainly technological in character.
- The locations of the cooperating firms reveal a prevalence of firms geographically "distant" from each other.
- Such agreements often involve a number of firms generating networks founded on interlinked technologies.
- The agreements used are quite varied, but they often are formalized in some manner (written contract).

Such generalizations are certainly applicable to large firms, on which the overwhelming majority of the available empirical surveys are based.³ The routes by which the new organizational formulas seem to spread within small firms appear, however, to be different.

3. This can be explained in part by the current methodologies used in such empirical checks. Normally the source of information is analysis by the specialized trade and financial press, which necessarily records only the agreements of the greatest significance (entered into by multinational firms listed on the stock exchange and objects of attention by the media). This does not mean that agreements by small firms do not have receive such attention from the media, but it is, of course, more difficult to gather information on such events.

Today, the Italian SMF—and probably those in other countries as well—can be described on the basis of a “dual” model. On the one hand, it is dynamic, aggressive on markets, innovation oriented, capable of carving itself significant market niches in which to exercise some force, and attentive to its own dynamically balanced path and thus to the retention of such a force over time. On the other hand, it is a SMF turned in on itself, technologically dependent, little capable of dominating the market, and frequently operating in the field of low-grade subcontracted supply.

Much of the empirical evidence reveals that such models cut across numerous industrial fields and as many geographic areas horizontally. The two typologies of firm are differentiated, however, by their different capacities for relationships with the exterior—that is, their abilities to select and manage long-term relationships with suppliers, customers, public and private business, or, in short, with the “milieu”.

Often dynamic firms and inward-looking firms—while sharing the availability of firm-specific skills, good industrial relations, a taste for work well done, and the centrality of the figure of the entrepreneur—are differentiated precisely because of their abilities to relate to the environment (which also lead to good overall performances and good prospects for “holding fast” over time).

If this is a differentiating element, then what is the genesis of such an ability to manage external relations in the best way? Although it must be recognized that it is initially a cultural problem for whoever has real responsibility for a firm (entrepreneur or management unit), there is increasing awareness that the environment in which the firm is placed may play a decisive part in supplying the “customs” on which cooperation is based, either by limiting the way in which firm can undertake cooperative arrangements or by leaving the firm absolutely free to organize its external relations.

The field of innovative processes, in a broad sense, is one that lends itself to consideration and verification of such attitudes since it, more than many other fields, is subject today to numerous externalities that put firms in a position to acquire skills and operating instruments in ways not stemming from the market.⁴ It follows from this, for example, that firms in science-based and research-intensive fields will be more effectively motivated to undertake collaborative relations.

4. In addition to real cooperative agreements, the field of technology is subject at least to two other forms of externalities: on the one hand, the so-called spillovers arising from the fact that the products of research and development cannot be appropriated in their entirety; and, on the other hand, the operation of “public agencies” variously dedicated to the transfer, insemination, and diffusion of technological skills and knowledge.

Further evidence of this lies in the growing awareness (even in small firms) that such opportunities for cooperation open up more where the results of technological improvements (which are often incremental) cannot be stably appropriated by the firms that introduce them, nor do such improvements in themselves constitute a sufficient guarantee of their own economic success (Teece 1986). In fact, a firm's specific know-how and its ability to reorganize individual elements into a complex product, supply the product system (hardware, software, services), and organize productive, organizational, marketing, and financial resources around the technological resources are factors that come frequently into play. Thus, the possibility of cooperation that is effective even for small firms appears to be linked to the ability to manage the external relations in step with the acquisition of distinctive internal skills enabling the firm to take advantage of the “common” activities.

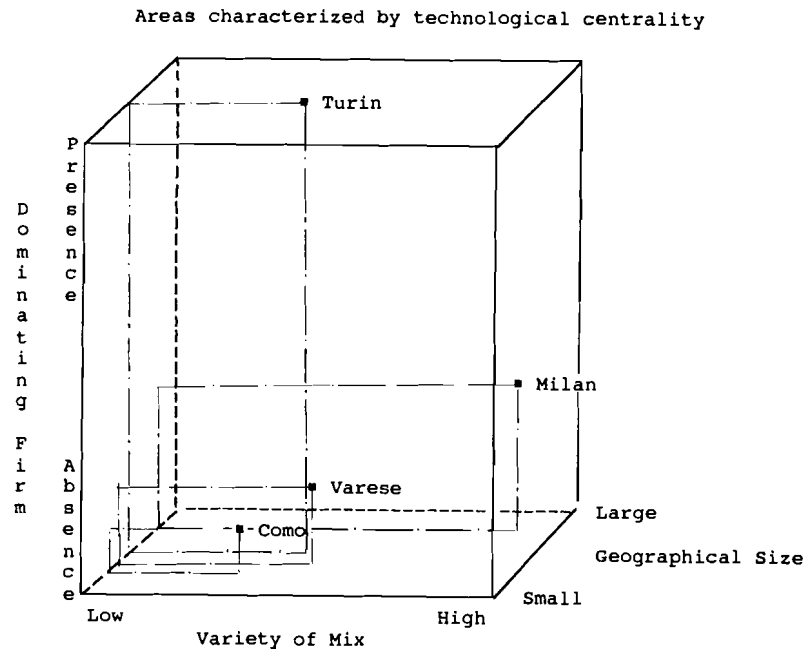
The Role of the “Environment” in Non-competitive Relations

Because spatial proximity counts for more in terms of potential contacts, exchange of information, and shared values than reduced transport costs (Camagni 1991), the milieu affects the efficiency of the local productive system. But efficiency still has more to do with the system's dynamic competitiveness, its capacity to move, and its flexibility in response to external changes.⁵

Of the plausible dimensions of different milieus, four are significant in relation to the approach used here (Bramanti and Senn 1990):

1. degree of trade diversification of firms in the area (variety of mix);
2. degree of dimensional diversification (with presence/absence of a dominating firm);
3. technological dependence/domination relations of the area (technological centrality or presence of poles of excellence);
4. geographic size of the area and its degree of openness to the foreign sector (not only of commercial type).

5. Investigation of the “environment”—that is, the external local background of the firm, almost “ecosystem”, comprising the firm itself and other subjects—and its connections with the rise, development, and contribution over time of the local industrial system, is relatively recent. In fact, it transcends the Marshallian concept of “external economies” because it includes elements of hardware (subjects, infrastructure), software (nature and quality of relationships and bonds among subjects), and system engineering (development of networks of relationships, emergence of rules of behaviour, and their modification as time passes). One of the most significant contributions to debate on the subject has been made by the GREMI international workshops.



Typologies of collaborative relationships between firms:

- Type A: facilitated by the environment (Como)
- Type B: imposed by dominating firm (Turin)
- Type C: delivered to the free initiative (Milan, Varese)

FIGURE 1 Plausible dimensions allowing characterization of different milieus

Different combinations of these four dimensions lead to the identification of three types of territorial areas (with possible subareas) that have a certain importance in the routes followed by firms in setting up intercompany cooperative relations. These routes are significantly differentiated (see Figure 1).

Area 1: Little or no diversification in the mix of operations; prevalence of small and absence of dominant firms; moderate geographic extent and considerable opening to abroad; broad range of placement on the continuum running from technological dependence on the outside (some industrial districts in southern Italy) to domination. Como typifies this "system area".

Area 2: Prevalence of small firms with presence of dominating firms; greater geographic extent and less opening to abroad; technologically dominant in the sense that it finds all necessary inputs in its interior (often supplied by the dominating firm itself). The Turin area

around FIAT typifies this background of systems of subcontracting to big firms.

Area 3: Ample diversification in the mix of operations; broad dimensional diversification in the absence of a dominating firm (possible presence of a number of leader firms); wide place on the continuum of geographic extent (from small to large); opening to abroad (from closed to internationalized); and technological domination. The provinces of Varese and Milan typify an area having a diversified industrial structure (discussed in the next major section).

Based on these different territorial backgrounds, it is possible to show three routes that can lead to forms of more than occasional collaboration among firms. The first route is facilitated by the environment and necessitated by technological innovation. The second is imposed by the dominating firm. And the third is attributable to free initiative and an self-evaluation capacity.

The First Route: Como Silk Industry

The Como silk industry is organized in "drawplate fashion", with strong systemic integration among the different firms making up the district (fibre production, twisting-texturization, weaving, finishing, dyeing and/or printing). In the late seventies, suffering from the increased competitiveness of the Far East countries, especially Japan, the industry produced a significant innovation, artificial silk, which has been defined correctly as a "system innovation". Various incremental innovations in cascade were rapidly diffused among even competitive firms and were often implemented in a coordinated way by a multiplicity of businesses, even in forms of interfirm cooperation.

In this case, it was the background (the market in particular, as well as preexisting interfirm relations) that pushed firms toward forms of stable cooperation. The Como production system is in fact characterized by a high degree of division of labour among different firms (implying increasing and even multisectoral productive interdependence); ease and frequency of relationships among the various firms in the system, enabling a cascade of transmissions of innovative phenomena; and workers having a high accumulation of skills. In this context, the absence of vertically integrated firms with market power (to establish significant relations, for example, with Japanese leaders), so that they can do without the other businesses in the system, favoured the restrengthening and efficient operation of networks. According to the *Unione Industriali di Como* (1983:110—this author's translation),

the need for vertical coordination becomes greatest when the use of multifilaments is accompanied by controlled decorticating treatment. At this point it may be said that the construction of the fabric must be developed in a coordinated manner in all its manifold processing stages. . . . Different businesses, nearly always linked by relationships of contractual antagonism and having different company dimensions, operating scales and managerial logic, were obliged to cooperate with each other in setting up, experimentation, and control of results. And, take good note, this cooperation must continue to last. It is in fact necessary not only during the stage of setting up the article in pilot production, but also at the stage of mass production.

But cooperation is not without difficulties. The stimulus resulting from innovation and the situation has in fact stressed the limits of the Como environment,⁶ and the artificial silk venture demonstrated the absence of "guide businesses". The constellation of firms, although present, has not shown any great capacity to operate as an integrated constellation (Lorenzoni 1990). It thus becomes essential for integrated firms to show themselves capable of taking over this basic guide function, allowing them to extract further cooperative attitudes from the entire constellation of firms (Martini and Pontarollo 1990).

The Second Route: The Turin Area and FIAT

The second territorial archetype demonstrates the role of an asset restructuring policy applied by a large firm, FIAT, which decided to tie its subcontractors to more stringent standards of quality, reliability, and economics (Enrietti 1987). In line with a trend affecting the worldwide motor vehicle industry, and because of the overall high importance of purchases (60 percent of the total cost of an automobile), FIAT decided between 1981 and 1982 to implement a supplier selection policy. As a result of that policy, about 350 supplier firms out of a starting total of 1,200 disappeared. Because the spark that set in motion processes of cooperation among companies was external to the individual small suppliers of components, cooperation was in a sense "imposed" by the leader firm.

The subcontracting supplier thus found itself bound, on the one hand, to adapting rapidly to the new standards imposed, and, on the other, to involving its own group of suppliers, often organized at different levels, into this process. In various cases it was the process of collaboration among the different subcontractors that allowed overall adjustment of the system in response to the outside stimulus imposed by the main contractor.

6. It would not in fact be credible to maintain that collaborative forms present all the advantages of hierarchical organization and all those of organization by external routes; indications of the possible costs of cooperation thus become extremely precious (L'Impresa 1989; Lassini and Mariti 1991; Camagni 1991).

The case of Turin shows a trend in line with the evolution of subcontracting in Europe.⁷ It is a question of transition from subcontracting to co-makship. Such a transition implies stability in relations, and it can give rise to real partnerships between the firm and its subcontractors: the main contractor provides a vast range of services, stimulating the suppliers to even make proposals about the product and delegating them an increasing role in project design.

This process favours formation of "cascade" subcontracting supply systems, constituting real areas of intercompany cooperation (Rampa-Sacchi 1985). In the FIAT case, as for the Japanese case reported in Figure 2, the suppliers' roles are already formed into three levels:

Manufacturers specializing in complex components belong to the first. The factors characterizing these firms are: considerable product development capacity; high quality level and constant product quality; capacity to offer products to a wide range of consumers; ability to generate sufficient self-financing so as to maintain their own research programmes. These suppliers work in close cooperation with the automobile maker in the product design and development and have a direct responsibility for end-product quality/performance.

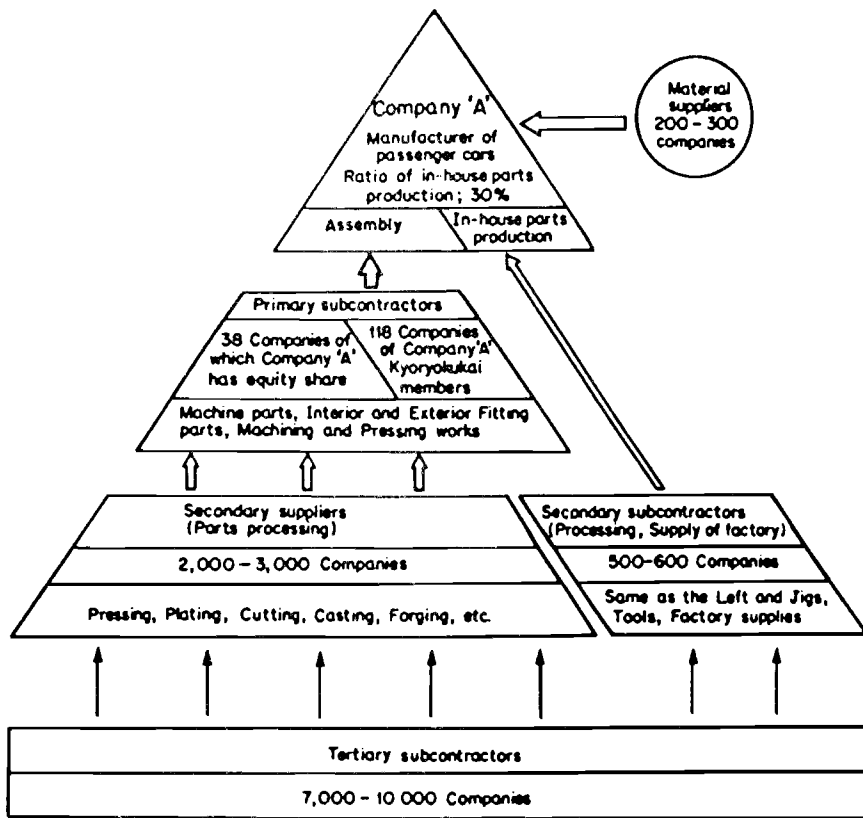
The second level comprises suppliers dedicated to the production of simple or not so complex components, almost exclusively for motor vehicle use.

At the third level there are the big makers of standard products and firms characterized by low series mass production with high flexibility (Enrietti 1987:122—the author's translation).

In both the Como and FIAT models the cooperation processes were imposed in a strong sense, or at least directly solicited by the background: for firms that did not adjust to collaboration, the alternative was to leave the system (and actually a number of them did). It is thus possible that the cultural learning process is slower here and that change is embraced for going to the market but is not regarded as a real leap permanently introducing cooperative relationships into the range of instruments available to firms as a complement to competitive market relationships.

There is a big difference in the case of an industrially diversified background, in which no particular obligation to embrace cooperative attitudes emerges (in fact, many firms regard themselves as self-sufficient). It is thus interesting to identify which characteristics of such areas trigger collaborative relationships, while at the same time confirming the existence of significant systematic differences between one metropolitan pole, the Milan case, and an area which, although equally developed, is more peripheral, the province of Varese.

7. Two recent European congresses organized on the subject with the participation of the European Community have been compared: one on subcontracting in Europe and the other on the relations between small and large firms (DG XXIII & TII 1989).



Note: Ratio of in-house production = $\left(1 - \frac{\text{Purchase cost} + \text{Cost of outsourcing parts processing}}{\text{Total Manufacturing Cost}}\right) \times 100\%$.

FIGURE 2 Typical productive structure of a Japanese auto motor producer (Source: DG XXIII and TII, 1989. *Partnership between Small and Large Firms*. London: Graham and Trotman, p. 73.)

Intercompany Collaboration in Two Areas with Diversified Industrial Structures

This section draws on a considerable store of information obtained from recent empirical surveys of small and medium-sized product innovating industrial firms operating in the Varese and Milan areas.⁸

8. Four empirical surveys with somewhat differing methods and aims were made of the metropolitan area of Milan and the neighbouring province of Varese. Albeit with all due caution, it is possible to extract from the empirical evidence gathered some trend lines of the interindustrial cooperation phenomenon among SMFs. See CEDOC (1990) and Bramanti and Lampugnani (1991) for Varese, and Camagni and Rabellotti (1992) and Bramanti (1989) for the metropolitan area.

The comparison of different experiences permits some answers, albeit initial ones, to the numerous questions raised by the spread of such attitudes. A few preliminary observations will allow the course of comparison to be seen more clearly.

The industrial structures of the Varese and Milan areas are similar in many ways. Both areas have long-standing and flourishing industrialization; a high rate of active population engaged in industrial activities (especially in Varese); a good supply of services, even excellent in the case of the Milan metropolitan pole; widespread entrepreneurship, accompanied by a certain "cultural mistrust"; a strong trend toward exporting and thus a habit of looking beyond the Alps; and great and widely held wealth and an industrial mix in which mechanical and textile industries are historically strong but are also accompanied by numerous new specializations.

The firms examined in the two different areas show strong behavioural homogeneity from many points of view. In particular, their patterns of reading innovative routes are surprisingly similar (Bramanti 1989; CEDOC 1990; Bramanti and Lampugnani 1991; Camagni and Rabellotti 1992):

- In these firms innovation almost never constitutes a "break" in a firm's production process but rather a moment along the path of growth and a means of continually improving the firm's product.
- This leads to an active strategy in relation to the innovative variables, based on great attention to users' requirements and the constant monitoring of ideas.
- Substantial attention is devoted to the market: the technological skills-market ability combination has proven to be the most effective way of achieving successful products.
- In all firms a significant capacity (such as an R&D department or technical department) has been established for the development of new products.

Some differentiating factors must be mentioned as well:

- In the Milan area there is a complex of firms which is, on average, more open to the world abroad about both the ratio of exports to total production and the information and knowledge underlying innovations.
- In Milan the role played by the local system (suppliers, services, information input) is greater than that played by the system outside the province.

As for cooperation itself, a certain difficulty emerges in instituting collaborative agreements among firms. Where agreements are reached, they cut across such connotations as multilocation, belonging to a group or not, the different origins of capital, and a firm's perfor-

TABLE 1 Varese: Numbers of Agreements by Business Area and Degree of Complexity

Business Area	Non-equity				Equity	Total
	Simple		Complex			
	Oral	Written	Oral	Written		
Commercial	34	2	2	2	2	42
	80.8	4.8	4.8	4.8	4.8	100.0
	82.9	100.0	100.0	100.0	50.0	82.3
Productive	7				2	9
	77.8				22.2	100.0
	17.1				50.0	17.7
Total	41	2	2	2	4	51
	80.4	4.0	4.0	4.0	7.8	100.0
	100.0	100.0	100.0	100.0	100.0	100.0

Source: A. Bramanti and C. Lampugnani. 1991. "Tessuto economico locale e rapporti di collaborazione nelle aree di frontiera". In F. Boscacci and G. Gorla (eds.), *Economie locali in ambiente competitivo*. Milan: F. Angeli.

Note: The three numbers appearing in each cell express the number of agreements in absolute terms (first line), in percentage of the number of agreements in the same business area (second line), and in percentage of the number of agreements with the same degree of complexity (third line).

mance. On the contrary, a stronger relationship to company size exists: as firms increase in size the intraclass proportion of firms with existing agreements in force increases as well.

On the basis of these first considerations, a threshold effect already emerges. It is not, however, necessarily related to size in an absolute sense but rather to a firm's international attitude, the entrepreneur's mentality, and the level of openness to innovation shown by business.

In the sample of firms surveyed in the province of Varese, 51 agreements were recorded. Only about 8 percent of these agreements were of the equity type (see Table 1). Among the non-equity agreements, 84 percent were of the "simple" type.⁹ As for the business activity covered by agreements, the overwhelming majority could be classified as commercial type (82 percent); only about 18 percent dealt with productive activities.

In line with the mainly informal realizations of such agreements, more than half of agreements stemmed from personal acquaintances. A further 30 percent arose from occasional contacts with the future partner, and only the remaining 12 percent were reached through official organizations, bearing witness to the small part played by inter-

9. The degree of complexity refers to the number of business aspects involved in the agreement. A "simple" agreement simply concerned production or marketing or finance, for example, whereas a "complex" agreement simultaneously involved, for example, research-design-production or prototype-industrial production-marketing.

mediaries—even for information only—in reaching cooperative agreements.

Cases of "informal" cooperative relationships are more frequent, particularly in the machine tool industry between producers and main customers. This type of connection, however, practically never results in a written contract. Some motives for such relationships appear to be more significant than others.

1. A small firm often perceives a formal restraint to be a substantial restraint; it wishes to maintain absolute independence (or at least the perception of it)—see Bramanti (1989). If, for example, a firm is supplying two prototypes of a new machine tool for two of its customers, that firm is, in the process, tying up substantial fixed capital. Thus, it wants to be able to dispose of the tool at any time without feeling itself under restraint.

2. In addition, in the example considered it is particularly difficult to give a formal expression to the content of return information and suggestions from the user; it is clear to firms that the efficacy of the cooperation is based on a relationship of trust that cannot be coded; a contractual form adds nothing to the substantial content of the cooperation, whereas it poses some additional restraints.

3. Last but not least, a formal expression (a contract) has its own cost: it often requires legal or technical consultancy on the part of small firms in order to ensure that there will be no possible undesired effects.

Milan is a different situation. In Milan informal intercompany cooperation is characterized by a greater degree of formal expression in agreements.

There is also a significantly larger concentration of input and technology suppliers in the metropolitan area for whom connections are always of fundamental importance. Thus, the number of connections inside the area is higher. The presence of a certain number of firms that have given rise to new small firms (either through spinoff or through the process of affiliation and redesign of the productive process) is equally significant. It emerged that there was a natural tendency toward integration of generating firms and generated firms. This then presents the possibility of the development of smaller firms through an industrial group (IReR 1988). Interestingly, recurrent forms of intercompany, or in this case intergroup, cooperation occur in groups with complementary technologies—that is,

[groups] strongly integrated from the productive standpoint of product policy and marketing, but definitely marked by autonomy of technological development of different companies, which takes concrete shape in a multidirectional flow of technical know-how. . . . Interdependence between group firms—and hence reciprocal interdependence—is converging on the

supply of complex products and system products. These groups can be identified, in our sample, only in the field of capital goods, in which technological convergence among microelectronics, informatics, mechanics and plant technology requires the availability and implementation of complex know-how based on the integration of dissimilar and complementary skills. (IReR 1988:176—the author's translation).

Of the 38 firms surveyed (Bramanti 1989) in the metropolitan area, 68 non-occasional cooperation agreements with other firms were recorded. Half of these have firms connected inside the same groups as the other party. Thus, on average, each firm had an existing agreement with another potential rival in the market (see Table 2).

The large majority of agreements were formally expressed (written contracts), probably because the content of the agreements mainly concerned: the technological area directed to the innovation of the product (from the upstream phases of R&D to those of downstream production); complex products affording greater opportunities for interactions; firms with a more evolved R&D component than those in the Varese area—the latter were more internationalized, often with an R&D manager or a design manager.¹⁰

Conclusions

Although the evidence recorded is not conclusive and was obtained using different methods, it appears that firms in the Milan area have made fuller use of the instruments of cooperation among firms. This is not by chance; in particular it emerged that the use of such instruments is proportional to the level of a firm's innovative drive, the presence of a formalized R&D function, the production of a system product, and the degree of international involvement, which in turn is connected with the specific environmental characteristics of that firm. In this sense there is no doubt that Milan exerts a significant "metropolitan effect" (Camagni and Rabellotti 1993).

In conclusion, it can be recognized that the different categories of milieu exert a decisive influence on the cooperative attitudes of firms and economic agents. Where conditions do not "force" firms to resort to collaborative instruments, it is left to the parties' free enterprise to undertake such arrangements.

10. The investigation showed that no less than 71 percent of the interviewed firms had an R&D department claiming numerous connections in Italy (39) and abroad (8), with 11 common research project currently under way. R&D managers were found in more than half the firms, with design managers in about 42 percent of firms. These significant human resources have contributed to the realization of 42 new products (not existing on the Italian market), 175 new products for the firm, and 67 changes in already existing products (Bramanti 1989).

TABLE 2 Milan: Numbers of Non-occasional Cooperative Relations in Existence with Other Industrial Firms by Type of Agreement

Area of Agreement	Formal Agreements			Informal Agreements			All Agreements
	Associates	SMFs	Total	Associates	SMFs	Total	
<i>In absolute terms</i>							
Technological area:							
Research & development	17	11	30	2	4	7	37
Engineering	5	4	11	2	2	4	15
Testing	2	1	3	—	1	1	4
Quality	3	1	4	—	1	—	5
Production	3	1	4	—	—	—	4
Market area:							
Price policies	7	1	8	1	—	1	9
Marketing	3	—	3	—	—	—	3
Purchases/procurement	2	1	3	2	4	6	18
Product area:							
Range expansion	2	—	2	—	—	—	2
Manufacturing licences	5	3	8	—	—	—	8
Total	29	15	53	4	9	15	68
<i>As a percentage of all agreements</i>							
Technological area:							
Research & development	25.0	16.1	44.1	2.9	5.9	10.3	54.4
Engineering	7.4	5.9	16.1	1.5	2.9	5.9	22.0
Testing	2.9	1.5	4.4	—	1.5	1.5	5.9
Quality	4.4	1.5	5.9	—	1.5	1.5	7.3
Production	4.4	1.5	5.9	—	—	—	5.9
Market area:							
Price policies	10.3	1.5	11.8	1.5	—	1.5	13.2
Marketing	4.4	—	4.4	2.9	5.9	8.8	26.5
Purchases/procurement	2.9	1.5	4.4	2.9	5.9	8.8	19.1
Product area:							
Range expansion	7.4	4.4	11.8	—	—	—	11.8
Manufacturing licences	4.4	1.5	5.9	—	—	—	5.9
Total	42.6	22.0	77.9	13.2	29.9	42.0	100.0

Source: A. Bramanti, 1989. "Servizi alla produzione e politiche locali. La domanda delle PMI innovatrici". Quaderni del Consorzio "Milano Ricerche", no. 2, Milan.

There is no doubt that cooperation is a significant cultural and organizational innovation for a firm, and that, like all innovations, it follows the lines of the least resistance, today consisting of research-intensive firms producing complex products (hardware, software, system engineering, after-sales assistance) in areas having a high degree of integration between the industrial system and the services dedicated to it.

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