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Environment, Resources and the Performance of Cooperative Strategies¹

Taïeb Hafsi, Lu Xin

Abstract

There is an increasing support for the need to link the resources available to the nature of the environment to appreciate the strength of the competitive advantage generated. For example, it is appropriate to think that property-based resources (Black and Boal, 1994) would provide an advantage in environments that are stable, but would not in turbulent environments (Miller and Shamsie, 1996). Applying such a finding to cooperative strategies, one would be inclined to think that cooperative arrangements dealing with property-based resources are more appropriate where the partners deal with a placid environment situation, but may lead to difficulties and problems in turbulent environment situations.

To take into account the environment, it is appropriate to identify the stage that the industry is going through. One could argue that there is a cycle in an industry evolution, with a first *formation* stage, that would probably end with a shake up, a second *growth* stage, a third *maturity* stage and a fourth *decline* stage, followed eventually by a reconfiguration stage. The formation and reconfiguration stages would in fact be transition phases leading to the next cycle, which is also generally defined by the three stages of growth, maturity and decline.

In our study of four industries, we discovered that there is a relationship between the industry stage and the nature of cooperative strategies (Demers et al., 1996). More specifically, it appears in situations of industry reconfiguration, that the smaller, more peripheral firms have more incentive in developing international alliances. It is the source of a significant and sustainable competitive advantage that is not easily available to the more established firms.

In this paper, we intend to bring together environment, more specifically industry characteristics, firm resource characteristics and occurrence and performance of cooperative strategies.

Introduction

It is often argued this is « the age of alliance capitalism ». And in fact there is a growing body of literature that deals with a variety of aspects of cooperative strategies. A recent series of three conferences on the subject, sponsored by JIBS, was held successively in North America, Europe and Asia. Three books and a special issue of JIBS (1996) were produced as a result, and add to an impressive body of literature on the subject.

If the 45 papers selected and published in this process are any representative of what is happening in this field, they cover a wide array of topics, but there are no papers that deal specifically with the nature of the resources involved, the relationship between performance and the fit among the characteristics of such resources and those of the environment (Miller and Shamsie, 1996). Even though resources are perceived to be important for the alliance or cooperative arrangement envisaged, even though the knowledge as a resource is examined, few papers focus on resources and environment as the determinants of a cooperative agreement (Demers, Hafsi, Jorgensen and Molz, 1996).

Yet, there is increasing support for the need to link the resources available to the nature of the environment to appreciate the strength of the competitive advantage generated. For example, it is appropriate to think that property-based resources (Black and Boal, 1994) would provide an advantage in environments that are stable, but would not in turbulent environments (Miller and Shamsie, 1996). Applying such a finding to cooperative strategies, one would be inclined to think that cooperative arrangements dealing with property-based resources are more appropriate where

¹ This research paper has been presented at a colloquium on Globalisation at the Robert Schuman University of Strasbourg, France and has been published in proceedings, edited by Sabine Urban, Professor emeritus in that university.

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In this paper, we intend to bring together environment, more specifically industry characteristics, firm resource characteristics and occurrence and performance of cooperative strategies. We shall first discuss the industry evolution ideas and suggest how these may affect cooperative strategy performance, then we shall discuss firm resource characteristics and their relationships to cooperative strategy performance. In the third part, we shall bring these three dimensions (environment, resources and cooperative strategies) together in a cooperative strategy model and illustrate the dimensions of the model with examples from our study of the clothing, consulting engineering, telecom and paper industries. The last section is devoted to a discussion of the implications for research and knowledge in strategic management.

Industry Evolution and Cooperative Strategies

The global competitiveness of an industry, or firm, depends on the characteristics of the diamond of its home base (home demand, supporting and related industries, domestic factors and rivalry). According to Porter :

While disadvantages in one or two determinants do not necessarily prevent a nation from gaining competitive advantage, the most robust competitive advantage tends strongly to be associated with widespread and self-reinforcing advantage in many determinants... The entire system is difficult and time-consuming to duplicate... and the system is hard to penetrate from another home base. (Porter, 1990a :147).

The very concept of the diamond rests on tightly coupled dimensions, which would function as a mobility barrier in relation to firms less favorably located. Although interesting, the national diamond logic applies mostly to dominant games, where firms have a dominant situation. A favorable national diamond creates the conditions for dominance, with a tight system designed to beat anyone outside of the system. Demand conditions are favorable to the development of strong, by international standards, competitors. As they become strong, it is important that they find competitive, by international standards, supporting industries both upstream, on the supply and subcontracting side, and downstream on the industrial final transformation and distribution side. Also, as they become stronger, all factors (labor, capital, technology, in particular) become critical for international competitive success. Finally, the work out is competition and the stronger the rivalry the better the ability to compete internationally. The success of more marginal firms appears to be an aberration.

Also, the national diamond concept fits better large, dominant economies, with a strong domestic demand that can be a strategic base for home firms. It does not fit small, open economies such as Canada, whose industries may be intertwined with those of other countries (Rugman and D'Cruz, 1993; Penttinen, 1994). Porter himself noted that the Swiss pharmaceutical industry successfully sources foreign technology and relies on demanding foreign customers more than on a large domestic market. Similarly, the recent history of Taiwan (Daleu-Diabé and Hafsi, 1993) shows that an economy composed primarily of small and medium-sized firms, in which peripheral games are prevalent, can be highly competitive in international markets.

As shown by Shamsie (1991), in dominant games, success is based on observable, measurable factors, such as those used in the PIMS studies. Certain firm-level strategies are thought to yield above average returns by creating and manipulating mobility barriers, such as scale and scope economies, and by using product differentiation (Barney, 1986; Porter 1991b).

By contrast, peripheral games are based on entrepreneurial discovery in processes analogous to those described by the austrian school of economics (Jacobson, 1992). There are many situations where the structure of industry is unclear. It may be highly politicized and competition may be severely constrained. In addition, the public sector may be dominant, and private sector initiative may not be easy to predict. Whether there are barriers to entry or to exit is the object of specific bargaining among key actors. The very definition of what may constitute differentiation may be subject to debate. This is clearly descriptive of emergence of an industry or the transition that leads to its reconfiguration. In such a case, as suggested by the evolutionary perspective (Allen, 1988):

The fluctuations, mutations and apparently random movements which are naturally present in real complex systems constitute a sort of 'imaginative' and creative force which will explore around whatever exists at present.

Evolutionary theories, most notably those of the Austrian school suggest that profit is not the result of monopoly power, but rather the result and the cause of entrepreneurial discovery and innovation. The goal of strategy formulation is not to limit competitive forces but to discover new ways to generate returns. To the equilibrium of traditional economics, we should here oppose disequilibrium. Entrepreneurs constantly create in a never-ending process of transformation and challenge of the established practices (Teece, 1986; Nelson & Winter, 1982).

More important, unobservable or hard to observe factors make the difference. «Invisible assets» (Itami, 1987) are crucial for competitive success, because they are difficult to obtain or to copy. The choice of entrepreneurial strategy varies widely: simple arbitrage of differences in market conditions across space; segmenting markets in new ways; extensions of existing products, technology, or markets; occupying niches ignored by dominant firms; inventions whose marketability is uncertain; and complex innovations to «create the future» (Mascarenhas, 1986; Hamel & Prahalad, 1994).

To take into account peripheral games, there is clearly a need for a complement to the formal diamond proposed by Porter. This has been proposed elsewhere (Demers et al., 1996) as being a virtual diamond. The virtual diamond offers a collaborative approach to competition, whereby a firm creates a network of value chain elements to compete globally. The collaboration does not necessarily take the form of formal contractual agreements. It is frequently based on informal understandings. The virtual diamond is the natural construction of a firm attempting to flee the boundaries of a situation where dominant games are the name of the game. The response is usually to discover and fill interstice opportunities that are not available or of limited value to dominant players. In a more global world, many peripheral players are finding it easier to build or participate in an international network, which could provide the equivalent of a diamond that has its parties spread over many countries.

For example, in a world of giant telecommunication companies, the rather small Teleglobe Canada was forced to focus on limited services, the international transportation of information, and to find partners all over the world to participate in the multiple projects needed to survive in the industry. It was therefore associated to American and European partners for different projects that had a bearing on the market positioning. At the same time, it benefited from a strong professional labor market at home, cheap capital and the availability of well developed supporting high-tech industries in the Montreal area. Finally, it was increasingly exposed to a growing and a very dynamic competition from other North American players.

Therefore the virtual diamond is not nation-specific. Elements of the value chain and other points from the national diamond may be located anywhere in the world. In addition, the virtual diamond is a creation of the firm, reflecting its strategy. Finally the virtual diamond requires collaboration among firms, where the national diamond disdains collaboration.

Dominant and Peripheral Games Over Time

The relative importance of peripheral and dominant games is clearly related to the industry dynamics. Over time the industry dynamics changes. We could even suggest that the industry evolves through a cycle, from formation through maturity and into reconfiguration where decline sets in (Demers et al., 1996).

As suggested in Figure 1, peripheral games are prevalent in the formation stage, because dominant games have not yet had time to develop. In such a phase there is a greater scope for cooperation, because resources are rare and collaboration could extend a firm's reach beyond its present capabilities. In addition, as the industry is in its formative stage, it is particularly risky to commit massive resources where games are not yet stabilized. Collaboration helps gaining resources without dangerous downside risks of heavy resource commitment. It has been noted in the literature that cooperation among firms could help promote a new industry and accelerate its growth (Porter, 1980).

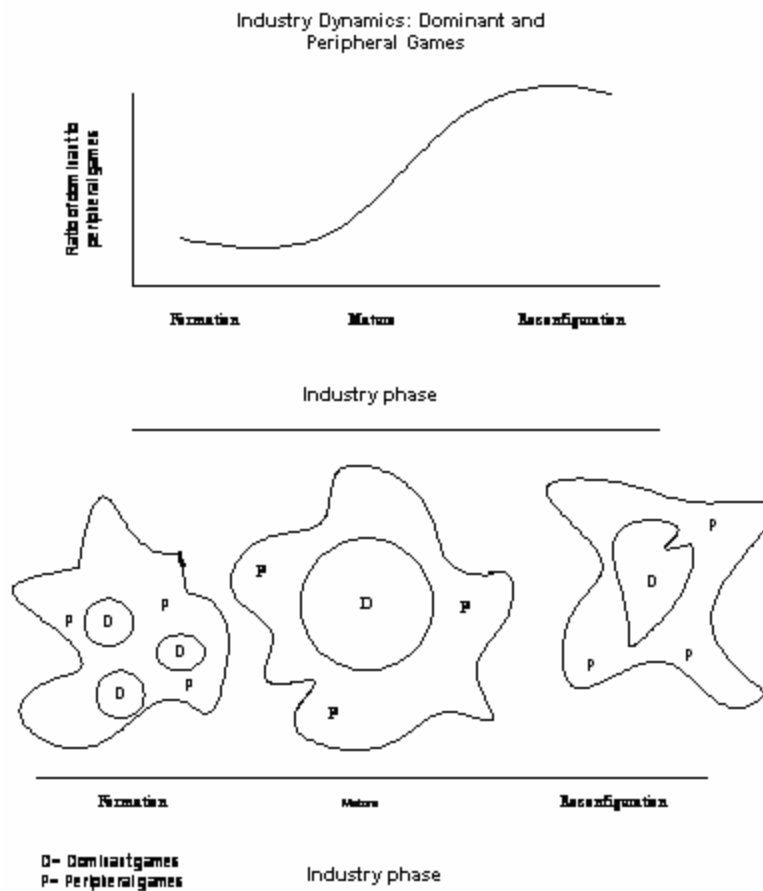


Fig.1. Industry Dynamics: Dominant and Peripheral Games

A typical example was provided by the providers of multimedia softwares. A company such as Mediasoft, a very small firm that marketed, among others, an interactive voice system designed to meet some of the shortcomings it saw in the Interactive communication marketplace by : (i) making interactive communications as easy to use as the PC-based platforms regardless of application size; (ii) providing peak performance and the ability to effortlessly grow the application from one to many thousand ports; (iii) make it open and flexible to allow customers to use their

existing computer and telephone equipments; (iv) building an architecture that is flexible enough to quickly adapt to rapid technological evolution; (v) enabling the application development to accommodate multi-languages in order to make the technology available on a global scale. This product, however brilliant as it may have been, as many that had been developed by competitors, could find its way in the jungle software unless the firm found partners for marketing purposes. Most of these partners had to be found internationally as most of the market was there. After many years of average performance and bare survival, the firm was able to thrive after major contractual arrangements with a few major actors in related industrial segments.

As the industry evolves, niches become more defined, technology stabilizes, entry barriers rise, industry boundaries become stable and product standards are confirmed. In such a situation dominant games become prevalent. Porter's work describes well this situation. Firms should then seek to dominate their rivals, compete vigorously and integrate as much as possible the value chain within the firm itself. Collaboration is of limited use and even dangerous for proprietary resources. The only collaboration acceptable is the one that helps co-opt potential rivals, and takes place usually between large and smaller competitors. This explains why it is so rare to find much cooperative arrangements in such industries as steel production, auto manufacturing, chemical products, etc. The only cooperation that seems acceptable in these industries is in fact through acquisitive control.

A mature industry actually continues to evolve. Entrepreneurs emerge, who recognize that it is hard to compete using dominant games, and question the dominant logic. If the industry is still attractive or can be made more attractive, these entrepreneurs seek out interstices and use peripheral games to penetrate and in so doing reconceive the industry. Dominant games may continue, but the industry boundaries are challenged, reformed by the attacks of peripheral players. As these games develop, the industry reaches its reconfiguration phase. It should be obvious that the forces driving globalization – technological innovation, deregulation, and the emergence of regional trading blocs and global market segments – are also pushing many established industries into the reconfiguration stage. The erosion of dominance by peripheral games appears to lead to an increase in collaboration. This has been documented in such industries as telecommunications (Smith, 1995) and automobiles (Resegger, 1991; Yoshino and Rangan, 1995), and has been confirmed in our own research.

The clothing industry provides one of the most interesting examples. An amazing process of fragmentation and reconfiguration has taken place in the last twenty years. This very dynamic industry keeps changing all the time with an incredible amount of firms doing new things, trying new ways to compete, and shifting the advantage to their side. For example, in the 1990s no one would have expected Canadian firms to be able to compete with the well-entrenched South and East Asian firms, yet an increasing number seemed able to do so. Paris Star, a very small concern was able to provide a package of low price, good quality, outstanding service, reliability and speed of delivery, that was perceived to be overall better than their nemesis.

This discussion leads us to propose the following propositions:

Proposition 1: *Porter's national diamond describes only dominant games and leaves out the interesting games that, though peripheral, are potentially the source of future dominance.*

For example, the study of Canadian competitiveness by Porter's Monitor suggested that there are only a few industries that are competitive, by international standards and these should be the focus of national interest, while all the others should be literally written off. A similar study of Morocco (Leymarie & Tripier, 1992) is even more revealing. According to the study, Morocco was weak everywhere and as a consequence a Morocco-based firm was doomed when compared to the more productive firms from industrialized nations. In both cases, more so in the Moroccan case than in the Canadian one, the prognosis is therefore bleak, neglecting the ability in these countries to play, in each sector, games that are different from those of the dominant players.

Proposition 2: *Peripheral games are generally based on cooperative strategies and lead to the construction of a virtual diamond, which is a firm's unique way to build competitive advantage through a network of partners from different countries and regional settings.*

The examples of the Canadian Paris Star or Peerless Clothing or even the American Liz Claiborne or the Italian Benetton, were typical. All of them were able to survive and be competi-

tive through a maze of cooperative agreements, and focus on limited segments, sometimes on interstices not necessarily visible to major textile players. This explains why the clothing industry has remained so fragmented all over the world.

Proposition 3: *Industries evolve through three major stages : a growth-related formation, maturity and a decline-related reconfiguration. Cooperative strategies are more common in the formative and the reconfiguration stages where peripheral games are more effective. They are less significant in the maturity stage, where dominant games are more effective.*

The pulp and paper industry, more mature, was in the 1990s less prone to alliances or cooperative strategies except for acquisitions or mergers for market control purposes. The software industry, in formation in the late 1990s and early 2000s, was the terrain for all kinds of cooperative agreements. The reconfiguring clothing or telecommunication industries were also a ferment for cooperation.

Proposition 4: *Given propositions 1 through 3, we would expect cooperative strategies to be more effective where the industry is in a turbulent stage (formation or reconfiguration).*

Such a proposition simply states that cooperation, as a strategy, being consistent with the turbulent formative or reconfiguration stages should be more effective in such a setting than where the industry is more mature and is more favorable to domination strategies.

Resources and Cooperative Strategies

Strategic alternatives are related to environment but also to the firm's resources. In the strategic management literature, the resource-based view (Wernerfelt, 1984) is growing in importance and developing into a significant theory (Peteraf, 1993; Miller and Shamsie, 1996; Spanos & Lioukas, 2001). Basically, the view (some would now say theory) examines the role of resources in the development of a sustainable competitive advantage. From the previous section the emphasis shifts from the nature and structure of the competitive environment to the resources available to face competition. The firm is then seen as a set of resources (Penrose, 1959). Wernerfelt (1984) suggests that "a firm's resources at a given time could be defined as those (tangible and intangible) assets which are tied semipermanently to the firm" (see Caves, 1980). Example of resources are: Brand names, in-house knowledge of technology, employment of skilled personnel, trade contracts, machinery, efficient procedures, capital, etc.). Looking closely at what is usually included in the term resources one could find property-dominated endowments, such as access to rare materials, as well as soft, difficult to define capabilities, such as in-house skills and technologies. It is therefore more appropriate to talk about resources, endowments and capabilities (REC).

Basically resources, endowments and capabilities have value when they are not easily available to competitors. "What a firm wants is to create a situation where its own resource position directly or indirectly makes it more difficult for others to catch up" (Wernerfelt, 1984). Among REC's characteristics which are attractive one could mention traditional resources such as :

- *Machine capacity* is an advantage where economies of scale are barriers to entry (Spence, 1979). They translate into resource position barrier because a late entrant would not reasonably acquire excess capacity that may lead to cut-throat competition. For example, in the oil refining, pulp and paper, automobiles, or raw steel industrial sectors, economic scales are huge leading to large commitments when production increments are needed. Incumbents have a decisive advantage. They have the information about the market and the productive capacity available, and they have the cost advantage that is related to experience, scale, and scope.

- *Customer loyalty* is related to all kinds of switching costs, including emotional ones. That explains the first mover advantage in government contracts, access to raw material, access to qualified personnel or sub-contractors, etc. For example, in the hospital supply services, switching costs are generally built in the products, with incompatible standards, differing training requirements, and simple familiarity between suppliers and customers. For government officials, the past is also a justification for continuing relationship, as a change may bring difficult to explain problems. To illustrate, ABB in the 1990s was a supplier of many heavy-duty equipments, for both mechanical and electrical applications. Its main customers were utilities and large industrial con-

cerns, both very sensitive to reliability and safety. ABB provided the close relationships and services that made its customers feel secure and think twice about a supplier change. Prices were often not a major factor, as long as ABB stayed within acceptable limits, which are often informally negotiated.

- *Technological leads* naturally generate a temporary rent situation, leading to copying and further development, and forcing everyone to keep investing in technology development to maintain the advantage. The consumer electronics industry was in the 1990s a case in point, and for example Sony Corporation, knowing that other would imitate any of its products within a year, had a strategy of constant innovation, forcing everybody in the industry to do the same or disappear. The same could be said of such segments in the computer industry as the supercomputer's (Kettani and Hafsi, 1994).

- *Production experience*, according to the experience curve, provides an advantage that requires time to build, which shields the organization. New competitors face an uphill battle, unless they come up with new and revolutionary production processes, or are able to have access to the experience « secrets ». This has been the case in the steel industry and in the pulp and paper industries, for example. In the steel industry, after a total domination of almost a century, only revolutionary production technology has provided opportunities to newcomers to take a very small part of the market (Collins, 2001).

In general, RECs must have some value. In other words, they must be relevant to the opportunities available in the environment, if they are to generate superior returns. Also, they must be difficult to create, acquire, substitute or imitate, if such value is to be actualized. The previously mentioned examples of resources have these characteristics albeit at different degrees.

More recent work (Miller and Shamsie, 1996; Maguire, 1997) suggests that the traditional divide in strategy between formulation and implementation could also be helpful in specifying further the RECs used in competitive games. Maguire talks about material processing resources and information processing resources, while Miller and Shamsie prefer property-based and knowledge-based resources. Although elaborately distinct, the two typologies can be considered quite similar. Material processing being closer to property-based, while knowledge based are information processing resources. In what follows, we make use of the property-based and knowledge-based distinction.

Miller and Shamsie's conceptual framework distinguishes between resources (in fact RECs) on the basis of the conditions or reasons for inimitability, considered a critical competitive factor. Therefore inimitability may be prevented by law, in particular property rights, or by knowledge barriers. Among property-based resources, endowments and capacities (PBRECs) one could mention enforceable long-term rights or contracts that provide an exclusive or a preferred access to scarce factors of production, a valuable technology, a market or distribution channels. For example, the Daewoo corporation, at the time where it was a small clothing company, was insightful enough, and probably lucky, to secure a large share of the quota to sell in the USA market occupied by South Korean firms. This was the equivalent of a monopoly power on a large share of all clothings coming from that country (Aguilar, 1986). Another interesting example was provided in the oil business when the American company active in Saudi Arabia were encouraged to sell the control of Aramco to the Saudi government. This suggests clearly that in order to generate unusual economic rents, property-based resources "require protection from exclusionary legal contracts, trade restrictions, or first-mover preemption" (Miller & Shamsie, 1996; Conner, 1991; Grant, 1991).

Knowledge-based resources, endowments and capabilities (KBRECs) allow the firm to succeed by providing a greater ability to adapt products and processes to meet competitive challenges. What makes these resources powerful is their higher degree of uncertain inimitability (DeFillippi & Reed, 1990; Lippman & Rumelt, 1982). Even though imperfect, the protection provided by KBRECs is very powerful because hard to assess or to understand by competitors. It has even been argued that KBRECs are more flexible allowing the firm to respond to a larger number of contingencies (Lado & Wilson, 1994). In contrast, it is argued that PBRECs are more specific and relevant only in the environment for which they have been developed. Take the example of a contractual arrangement with the Indonesian government for the exploitation of the Busang gold

mines. Such a PBREC can only lead to the exploitation of the mines within pre-specified conditions. It cannot help do anything else. However, the KBREC that Bre-X has developed in the identification and exploitation of mines can be applied in all kinds of conditions and would allow the company to probably find and be involved in other similar or different mines.

Looking at the relationship of performance, environment and resources, Miller and Shamsie have also shown that, in the film industry :

- i. PBRs, whether systemic or discrete, provide superior performance in predictable environments ;
- ii. KBRs, whether systemic or discrete, provide superior performance in uncertain environments.

Taking again the example of Aluminum, the contract of Alcan with the Jamaican government for the exploitation of bauxite mines provides a key property-based resource. It is also a discrete resource, as it stands on its own, and resembles all contractual resources that give direct access to a specific rent generating situation. If we now look at the competitive situation in the aluminum business, one would be tempted to relate the bauxite mines to all the mines available elsewhere, and argue that competitive advantage is related to the ability to make or control prices, and hence the network of mines controlled becomes critical, and provides a PBR that is systemic in nature. Similarly, in the industry, the unique set of skills that leads to the recognition of special geological configuration, and the discovery of valuable raw material assets is a discrete KBR, but if one relates these skills to those needed to market the geological discoveries and gather the financing needed to exploit the mines, then we have a powerful system of KBRs which might be even more difficult to imitate or replace.

Relating these findings to our idea of industry cycle we could propose:

Proposition 5: *In the early phase of an industry formation, where peripheral games are more common and uncertainty relatively greater, knowledge-based, rather than property-based, resources will provide superior performance.*

Proposition 6: *In the mature phase of an industry evolution, where dominant games are more common and stability relatively greater, property-based, rather than knowledge-based, resources will provide superior performance.*

Proposition 7: *In the decline phase of an industry, dominant games coexist with increasingly challenging peripheral games, leading to a greater uncertainty. PBRs and KBRs both contribute to superior performance, until reconfiguration takes place and KBRs contribution performance dominates.*

These three propositions are directly related to Miller and Shamsie's findings, and to the theory proposed by Demers et al. Formation and reconfiguration are two phases where turbulence sets in, leaving space for peripheral games that will challenge dominant ones and ultimately replace them. The formidable restructuring of the computer and telecommunications industries that took place in the last twenty years with the growth of the software segments has, since the early 1980s, kept these industries in a state of flux with many changes in leadership. The traditional, property-based, advantages of companies such as AT&T's, Bell Canada's, IBM's or Control Data's, have been displaced by the generalization of knowledge-based advantages of companies such as Cisco's, Microsoft's or Pitney Bowes', forcing everybody to follow suit or disappear. The amazing development of cooperative strategies in these industries and their apparent effect on performance leads to the following proposition :

Proposition 8: *Cooperative strategies are more common and more profitable where KBRs are more relevant.*

Towards a Strategy-Based Model of Cooperation among Firms

The environment generates more or less uncertainty making firms's strategic behavior more or less appropriate (Chandler, 1962 ; Thompson, 1967 ; Lawrence and Lorsch, 1967). It is important to be able to appreciate the conditions under which uncertainty increases. We have suggested that looking at an industry evolution, one could predict the level of uncertainty that firms in the industry may have to face. The level of uncertainty itself has a bearing on whether cooperation

is relevant or possible among firms. The level of uncertainty is not the only factor affecting the relevance and occurrence of cooperative agreements. The nature of the resources involved in the cooperative arrangements, their value, level of inimitability, and the existence of substitutes, also have a bearing on the decision to cooperate. These factors together determine the performance of the cooperative agreement considered.

Figure 2 delineates the various relationships proposed. It starts with the industrial sector stage of evolution. If the industry is in the formative stage, then cooperation is stimulated. If industry is mature, cooperation is discouraged. If the industry is in decline or reconfiguration, cooperation is again encouraged. If the industry is mature, even though cooperation is discouraged, there are resource conditions that may still make it appropriate. For example, dominance may be enhanced by a merger between two dominant firms. This has been the case recently in Canada when Abitibi-Price and Stone Consolidated merged into the largest newsprint group in the world. This is a situation where market conditions, here a highly competitive industry, and compatible property-based resources make some forms of cooperation, in particular acquisitions and mergers, productive and would provide superior performance. Similarly, if the industry is in a state of flux (formation or reconfiguration), even though cooperation is encouraged, resource conditions may make it hard to come by. For example, fragmentation may be reinforced by unclear advantages related to sharing a set of knowledge-based resources among a group of small competing firms. The fragmentation of the clothing industry in Canada, and more generally all over the world, is a case in point.

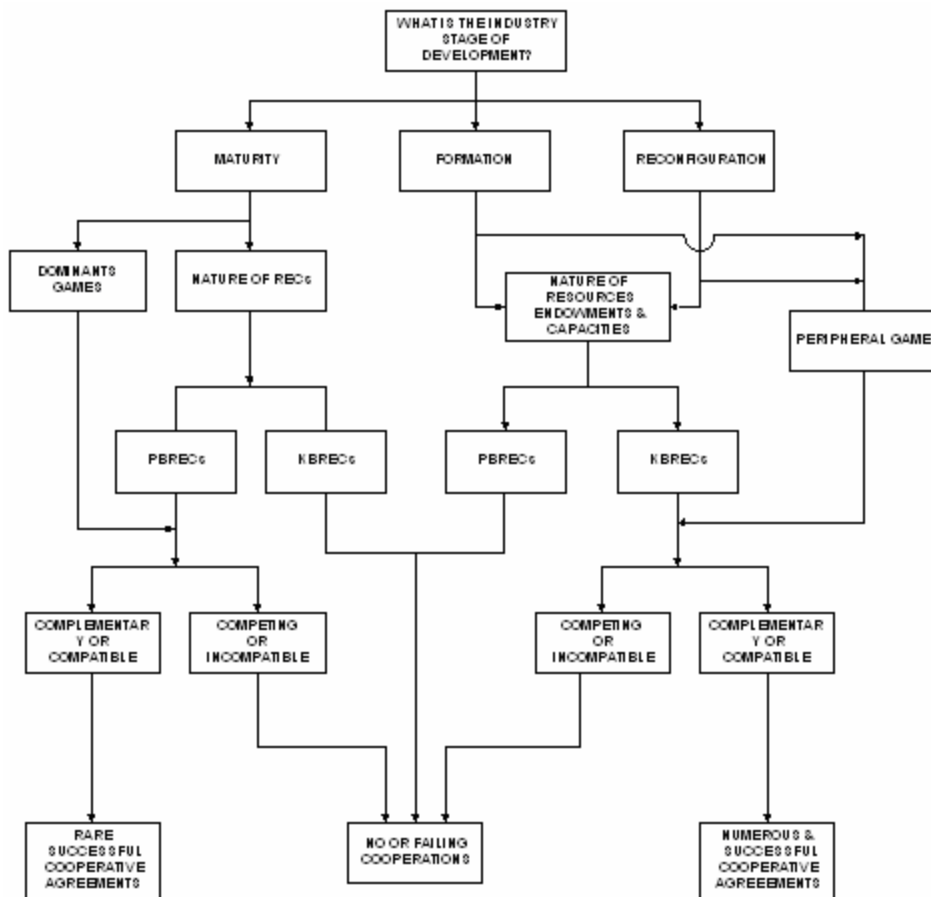


Fig. 2. Cooperation: a contingency model

Therefore, where the industry is in a state of flux (formation or reconfiguration stages), and knowledge-based RECs are perceived complementary, a source of synergy, cooperative agreements are both possible and lead to superior performance. This was the case of the telecommunications industry, especially in North America, during the 1990s. Where the industry is stable (mature stage), and property-based RECs are perceived to be competing, cooperation is both hard to come by, and where it is realized leads to poor performance. This was the case of the pulp and paper industry, since the 1980s. However, in the telecommunications and in the clothing industries, some firms are simply not attracted to each other, if their RECs are either property-based or, if knowledge-based, incompatible or if their strategic games (generally peripheral) are incompatible or competing. Similarly, in the pulp and paper industry, firms that had complementary or compatible RECs were occasionally attracted to each other to consolidate or increase the strength of an already dominant position. These two situations describe the exceptions to the rule. As a result, the following general proposition summarizes the model:

General proposition:

Stable and homogeneous industries, with relatively little uncertainty, tend to generate no cooperative arrangements except where dominant games and property-based resources available are compatible or complementary. In such a case, cooperative arrangements generate superior performance. But where cooperation is volunteered, despite incompatible or similar resources, it leads to poor performance.

Unstable and heterogeneous industries, with relatively high uncertainty, generate a large number of cooperative arrangements, except where peripheral games and knowledge-based resources are perceived to be incompatible or similar. In the first situation cooperative agreements generate superior performance. In the second situation, where volunteered, cooperative agreements lead to poor performance.

Illustrating the Model

We have looked at four industries: Clothing, Consulting engineering, pulp and paper and telecommunications. We shall describe in what follows how the recent developments in these industries appear to confirm the proposed model. Only the Clothing industry is described in some detail.

Canada is not a powerhouse in the world clothing industry. Canadians import much more in clothing than they export. The popular expectation is that Canada cannot compete with low-wage countries for the low end of the market and cannot compete with the Europeans in the high end market. For most of the industry these statements are correct, but there are puzzling exceptions. In Montreal, there are firms that compete successfully against South-East Asian firms, in the low end market, and others that compete successfully against European firms.

The Canadian clothing industry is part of a global industry. The global industry has been going through various stages, with a long period of stability that characterized most of the 1970s. The low end segment was dominated by producers in developing countries, and marketers in developed countries. The high end market was dominated by producers in South Asia and fashion houses in Europe and the United States, with a key brokering role for the latter. In the 1980s started a slow process of transition to fragmentation, both on the low end and the high end markets. First, on the low end, technology and wage deregulation made possible locally-based competition. Second, on the high end, fashion fragmentation takes place, leaving space for fashion designers and fashion products outside the usual fashion powerhouses.

In the 1990s, several Canadian firms had a significant competitive advantage, at least in the US market. Most of these firms had their core competence centered on production rather than marketing or even design as could be expected. Two firms were typical of what was happening in Canada: Peerless Clothing, which was the leader in the high end men's suits, and Paris Star, which was competing successfully head to head with South Asian firms.

Peerless Clothing had been established in 1919. In 1995, it was the world largest exporter of high-quality wool-based men's suits to the United States. With 20% of the market, it competed

successfully with such giants as the German Hugo Boss or the Italian Armani, in the Can \$300 to \$600 retail price range. It exported 90% of its production from the world largest single plant.

Peerless Clothing did many things right. The existing technology did not make possible an automation of the sewing part of the production process, but everything else was. Peerless Clothing targeted only small chains, which were unwilling or unable to take any risks, especially inventory risks. They had developed a highly sophisticated understanding of these customers' behavior and appeared to be able to predict with good accuracy the demand that they faced. In contrast to traditional industry practices, it was concerned with producing value for the customers, and thus produced to inventory, enabling customers to buy only those items and quantities that were currently needed, which reduced their inventory and losses. Inventory allowed also a fast response rate, unmatched by other competitors.

The success of Peerless was rooted in production-related skills. But it could not be materialized without outstanding marketing skills. To achieve that it has made alliances with small firms or talented individuals which took care of sales and promotion of suits in the US. Clear understanding and complementarity of skills allowed more flexibility and a large measure of entrepreneurial behavior throughout the system. The partners' insistence brought the set up of a large distribution center in Vermont, and the solidifying of customer response advantage.

As shown elsewhere, one could argue that Peerless had built a virtual diamond, in which each of the elements of the diamond were available in different places (Hafsi et Demers, 1995). More importantly, in this case, it had decomposed the usual value chain of a producer and rebuilt it with each part being performed by different actors. The state of flux of the industry, the large number of peripheral games being played and the fragility of most competitive positions, made the cooperative arrangements both feasible and clearly profitable for smaller firms. In the industry, even larger firms were able to profit from cooperative arrangements, even though in their case, Liz Claiborne or Benetton for example, these arrangements were mostly of a subcontracting form.

Another small firm in Canada, Paris Star of Montreal, had been able to provide higher value to their customers, generally large North American designers or distributors, than they could receive from European or Asian competitors. Their strategy was to identify and stick with small "interstice" markets. "We look for enough small niches, of say \$10 million, in the US, and if we succeed we are in good shape"¹. It is a kind of project-based strategy. They were constantly on the look for small markets or contracts. But such a strategy works only because they had been able to build a highly effective production system.

Production benefited from a highly automated and technologically sophisticated operations system, using advanced information technology. They also benefited from highly qualified and enthusiastic professionals, and an abundant labor market of immigrants, both highly qualified and willing to work at minimum wages. In addition, they had built a highly decentralized, entrepreneurial marketing organization, thus able to respond to customers' demands fast, with much flexibility, and at a competitive price. Paris Star formula was a good compromise of price, responsiveness, and quality for such firms as Liz Claiborne, Koret and Junior Gallery, in the US. Paris Star was also an attractive partner for large British firms such as Baird Textile.

Both Peerless Clothing and Paris Star developed all kinds of cooperative arrangements in order to thrive and survive. The nature of these arrangements changed all the time and was the subject of creative innovation, nibbling at the power of large firm, in a process of real "creative destruction." The industry being in a state of what appear to be a reconfiguration, it is not surprising to see a lot of alliances and significant success for those undertaking them. Other firms such as the Algo Group, which resembles Paris Star, bring together firms of similar skills, in an attempt to gain economies of scale and scope, but do not do as well.

Concluding Comments

Comparing with the situation in the Clothing industry, in the Consulting engineering case, the amount of know-how required to manage the virtual diamond network is much greater than

¹ Leslie Guttman, founder and former CEO.

was the case in the Clothing industry case. The maze of relationships and agreement creates barriers to entry that are too much for most except the leaders in the market. As a result, a firm such as SNC-Lavalin is among the ten largest in the world, highly profitable, growing fast with a portfolio of projects that makes it among the darlings of the Canadian stock markets.

Similarly, the telecommunication industry is complex and undergoing major transformations, with interpenetration from other information-based industries such as computers and information services. The industry was and still is in a state of flux and we can witness both major restructuring, including a large number of cooperative agreements, and attempts to secure established monopolies. This industry (and several other converging industries), with both a large amount of property-based and knowledge-based resources, generates acceptable levels of profitability. We can therefore see that they appear to be consistent with our model, but the changes are still too many and too important to reach any comfortable conclusion.

Finally, in the pulp and paper industry, mature and with limited transformations, there are very few cooperative agreements. The large Canadian firms do not see the need to join forces with others. They have the means to compete by themselves and undertake whatever is needed to keep their market position. Competition is so stiff, however, that there is a need to work on costs, which leads to numerous acquisitions and mergers to secure markets or supply, through vertical integration, or to increase economies of scale and scope, through horizontal integration. For example, Donohue, a large newsprint manufacturer is now owned by major newspapers from Montreal and New York. More recently, Abitibi Price and Consolidated Bathurst have merged to make the world largest newsprint manufacturer.

This is consistent with our proposition that mature industry and property-based resources are negatively correlated with cooperative agreements. They are also negatively correlated with performance, as profits in the industry are highly volatile and cyclical, the firms going through periods of boom and periods of bust, with limited overall attractiveness for investors.

These data are of course too sketchy to be conclusive, but they provide an interesting illustration of the model that has been proposed in this paper. The next step is now to put the model to the test of a larger sample. The difficulties of such a testing are related to two main issues: (i) being able to assess precisely the stage that the industry is undergoing is hard and its relationship to turbulence may become tautological. The best testing would require a longitudinal study of the industry and of the firms' behavior in the industry, but there we would be confronted with the availability of data. Deciding to study different industries, like the ones illustrating here our model, runs the risk of lacking the required perspective to assess with confidence what the stage really is. It forces us to choose a large number of industries making the task hard to manage. (ii) Most industries are now globalizing and may be at different stages in that process, which given the difficulty of data gathering reduces the generalization power of any conclusions. Therefore, even though the propositions and the model proposed make sense, the methodological issues and the operationalization of concepts for any generalizability study are the critical part of further work.

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