



University of Navarra

Working Paper

WP no 649

September, 2006

ALLIANCES AND INDUSTRY ANALYSIS

Carlos García-Pont

IESE Business School – University of Navarra

Avda. Pearson, 21 – 08034 Barcelona, Spain. Tel.: (+34) 93 253 42 00 Fax: (+34) 93 253 43 43

Camino del Cerro del Águila, 3 (Ctra. de Castilla, km 5,180) – 28023 Madrid, Spain. Tel.: (+34) 91 357 08 09 Fax: (+34) 91 357 29 13

Copyright © 2006 IESE Business School.

ALLIANCES AND INDUSTRY ANALYSIS

Carlos García-Pont*

Abstract

Traditionally alliances have been left at of industry analysis. We have been focusing basically on the economic characteristics determining bargaining power on the relationships between the actors in a value system. The paper proposes a methodology to analyze industries from a very different perspective that incorporates alliances as one of the main drivers of industry structure.

* Professor of Marketing, IESE

Keywords: alliances, industry structure, networks.

ALLIANCES AND INDUSTRY ANALYSIS

Whilst the term industry analysis is widely used, in popular management terms is basically referring to Michael Porter's (1980) five forces framework, based in the fundamental ideas in microeconomics at the time. The importance of industry analysis comes from the discussion of the sources of profitability of a firm. From Schmalensee (1985), to Rumelt (1991), Cool and Henderson (1997) or McGahan and Porter (1997) the dilemma of whether the sources of firm profitability reside on the firm or the industry level of analysis has received a significant amount of attention.

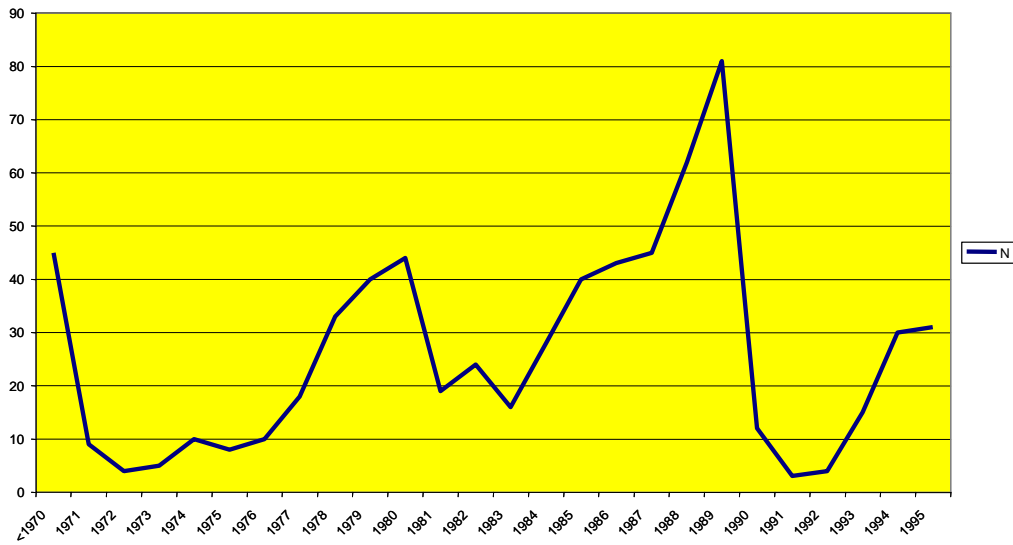
Hunt (1972) and Caves and Porter (1977) introduced the concept of strategic groups as an intermediate level of analysis that could help us explain the competitive structure of the industry. While there have been several studies trying to relate this intermediate level of analysis to firm profitability, the results are equivocal at best (Newman, 1978; Porter, 1979; Oster, 1982; Hergert, 1987; Barney and Hoskisson, 1990; Figembaum and Thomas, 1990; Lewis and Thomas, 1990). The concept, however is argued to be a solid theoretical construct (Nath and Gruca, 1997). Both approaches, Porter's five forces framework and strategic group analysis has been used for the development of competitive strategies within industries, beyond the explanation of profitability sources.

None of these approaches acknowledge the importance of the formation of strategic alliances within an industry. It is highly unlikely that these alliances do not influence firm performance. In fact, investors value positively the formation of joint ventures, a specific case of alliances, (Koh and Venkatraman, 1991). Moreover, Burgers et al. (1993) have argued that there is a causal relation between firm performance and the number of alliances established by a firm in the automotive industry. Even though, the results in trying to relate alliances to firm profitability are not consistent, it can be argued that they should be taken into account.

Even though the majority of previous studies have looked to alliances from a firm or alliance perspective, there are specific industries where it is not one or two firms who have an explicit cooperative strategy, but a dense network of alliances that has been established. In industries like automobiles, telecommunications or European banking, the number of alliances is such that one should consider whether the structure of the linkage network as part of an industry's competitive structure (see Figures 1, 2 and 3).

Figure 1

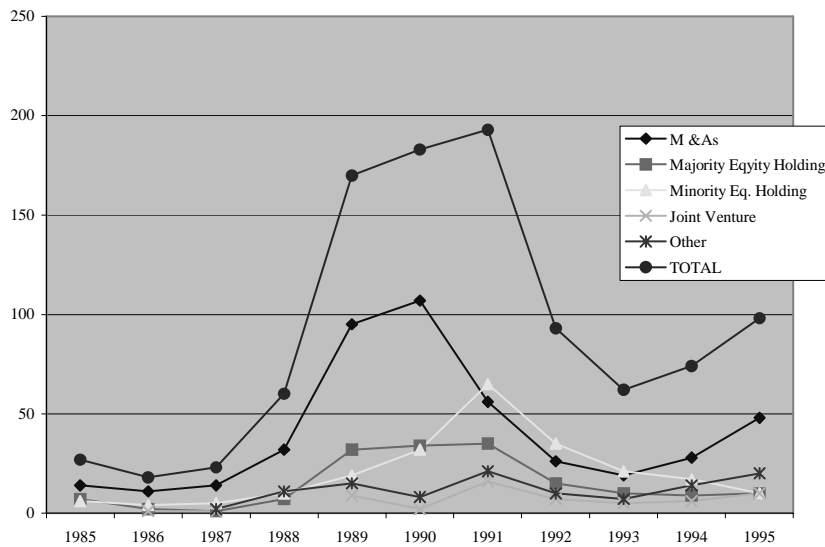
Number of alliances in the automotive industry



Source: University of Maastricht Data.

Figure 2

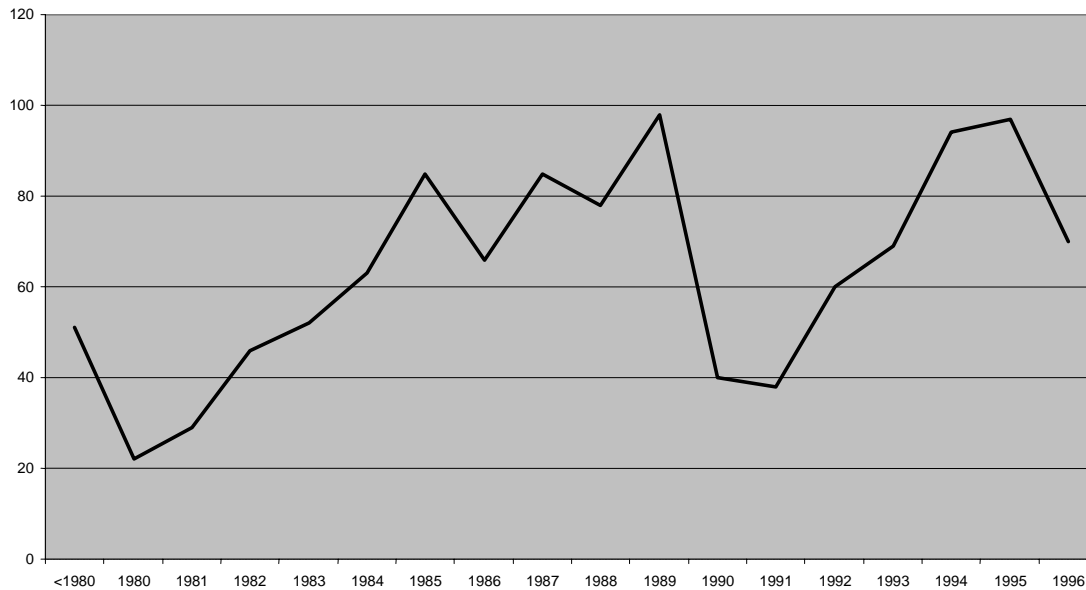
Number of alliances in European banking



Source: Own data.

Figure 3

Number of alliances in the Telecommunications Industry



Fuente: University of Maastricht Data.

A firm's position in the interorganizational network has been linked to performance (Zaheer and Zaheer, 1997; Ahuja, 1996). The relationships between firm performance and network position, has been extended to include firm survival (Uzzi, 1996). The notion of "social capital" which has been argued to be a source of network advantage (Burt, 1997), has been extended to alliance networks (Gulati, 1997).

The fact that alliances have an impact in firm performance, and that it is not only a firm's alliance but a firm's relative position in the network of alliances within its industry advocate that alliance networks are one more structural component of a firm's environment.

This paper attempts to put forward a framework that facilitates this incorporation. It will draw on two different streams of literature that of alliance networks and the resource based view of the firm. We argue that bringing together these two streams of research one can develop a clearer understanding of industry structure with implications for the development of firm level strategy.

Alliance Networks

The study of alliance networks has brought the attention of several scholars. The sociological concept of embeddedness has been extended to interorganizational relations (Burt, 1992; Walker, 1988; Mizruchi, 1992; Gulati, 1995). In Nohria and Eccles edited volume *Networks and organizations* (1991) there are several studies looking at the structure of the alliance network in specific industries¹, although they limit themselves to the structure of the network of alliances

¹ Barley and Freeman (1992), Kogut, Shan and Walker (1992).

and not to the competitive structure of the industry. In a recent issue of the *Strategic Management Journal* called Editor's choice, Gulati (1998) does a review of the social network perspectives in the study of alliances, reflecting the importance the field has assigned to the topic.

There have been several studies that have attempted to study the structure of alliance networks within industries. Walker (1988) identified cliques of firms within the aluminum industry in response to changes in the economics of the industry. The study of alliance networks in the biotechnology industry (Barley et al. 1992; Kogut, Shan and Walker, 1992) reflect the consequences of the emergence of a new set of technologies with the potential to revolutionize the basis of competition within the industry. Nohria and García-Pont (1991) argue that the oil shocks of the 70s and the emergence of important Japanese competition caused the wave of alliances among major automotive producers. Alliances among telecommunications operators² reflect the increasing technical change, deregulation in local monopolies and increasing globalization of the industry. Alliances in Europe reflect the opening of borders across European countries in the financial sector banking (García-Pont and Lessard, 1992). Vanhaverbeke (1995) shows how the race to define industry standards leads the formation of alliances in the RISC market (Reduced Instruction Set Computers).

We can argue that most industries where dense alliance networks have been found share one common issue. All these industries have been the subject of a significant real or perceived change in the basis of competition. Industry events have a clear effect in interfirm networks (Nohria and García-Pont, 1991; Madhavan, Koka and Prescott, 1998). Barley (1986) argues that major restructuring only occurs when organizations face 'exogenous shock'. Madhavan, Koka and Prescott (1998) specifically mention regulatory reforms or radical technological change as reshapers of interfirm networks. Both factors increase the potential for globalization in the industry. As can be seen, these factors are present in the examples mentioned above.

Therefore, it can be argued that alliance networks are one way, firms respond to increased uncertainty in their competitive basis. The reduction of competitive uncertainty has been found to motivate the formation of alliances across industries (Pfeffer and Nowak, 1976a, 1976b; Provan, 1982; Whetten and Leung, 1979). The studies mentioned above are specific examples of how the rise of alliance formation was caused by an industry shock that challenged the established basis for competition.

Resource-based-view and industry structure

The question is then what are these industry level shocks about. In order to illuminate this issue we will draw on the established resource-based-view of the firm (Penrose, 1959; Wernerfelt, 1984; Dierickx and Cool, 1989; Barney, 1991). The fact that an individual organization has a specific stock of resources and capabilities allows it to compete in the product-market space with other firms. Some of these resources and capabilities may be heterogeneously distributed along firms, difficult to imitate, a result of firm history, and not transferable, they constitute what Amit and Shoemaker (1993) call Strategic Assets.

A traditional perspective would identify the industry as the product market space where these firms compete with each other, emphasizing the outputs of the firm. The resource-based view

² See the case "Internationalization of Telefónica de España", IESE case No. DG-1136.

emphasizes the inputs of the firm. The strategic assets are the set of factors that contribute to the production of the specific goods and services. Following this perspective, we can think of an industry not as a space of products where the firm position themselves, but as a strategic asset space. In order to define this space, we approach industry analysis from a 'strategic assets' point of view (Enrione and García-Pont, 1995). Once you have defined the relevant competitors, one can evaluate the different strategic assets the rivals put into play. From specific manufacturing technologies, patents or complex institutional or organizational arrangements, one can identify the different weapons incumbents use. In this way, firms are positioned in a Strategic Asset Space, which is dual to the product market space in any point in time. Conceiving long-term strategy as position in the Strategic Asset Space expands the boundaries of the industry. When an industry is defined in terms of its outputs, the boundaries are defined in terms of the firms that deliver those products or services. When the industry is defined in terms of the strategic Assets firms have, the relevant firms are those that have a significant set of these assets. Another advantage of using the concept of strategic asset space is that it forces managers to think of strategic assets as one explicit key dimension of strategy. Conceiving strategy as a position in the strategic asset space implies introducing the specific issue of 'strategic assets' as one of the main axes of a strategy.

Once defined the resource-based view of industry structure as the position of the different firms in the strategic asset space, it is not difficult to analyze what an industry shock means. In periods of relative stability, firms base their competitive position in a stock of resources and capabilities that allow them to compete in the stable industry. An industry shock suddenly challenges the present stock of resources and capabilities (Nohria and García-Pont, 1991) leaving firms with a perceived uncertain competitive position. When an industry shock occurs, firms are challenged in their traditional way of competing. This long-term competitive position is based on the present stock of strategic assets. Thus, firms are challenged in their basic stock of strategic assets.

Alliances and the Strategic Asset Space

Organizations enter partnerships when one organization has resources or capabilities beneficial to but not possessed by the other in the more traditional exchange theory aspect of a relationship (Levine and White, 1961; Aiken and Hage, 1968). Being knowledge one of the most important assets, it has been argued that alliances are knowledge transfer mechanisms (Powell and Brantley, 1992; Powell, Koput and Smith-Doerr, 1996). Researchers have linked the formation of alliances to the distribution of various kinds of strategic assets within the industry (Gulati, 1998). Strategic assets have been country-specific resource-advantages (Shan and Hamilton, 1991), strategic capabilities in the automotive industry (Nohria and Garcia-Pont, 1991), relative size and performance of firms (Burgers, Hill and Kim, 1993), relative experience in more developed financial markets (Garcia-Pont and Lessard, 1993) and specific technical knowledge in the RISC sector (Vanhaverbeke, 1995). In the biotechnology sector, firms enter relationships according to their differences in need and capability (Kogut, Shan and Walker, 1994). Furthermore, it can be argued that interfirm relationships can be considered to be resources in their own right.

All these studies provide evidence that strategic alliances can be a way through which firms gain access to different kinds of strategic assets. Alliances can be considered one way firms reposition themselves in the strategic asset space. Of course, each individual alliance has a

particular and concrete objective which has to be achieved; this is usually an operational objective, with concrete and budgetable results. These results are the consequence of pooling specific resources by the partner firms, so they are only possible if firms contribute to the cooperation (Larsson, Bengtsson and Henriksson, 1997).

Thus, alliance networks can be interpreted as the clearance of a market for strategic assets given perceived environmental uncertainty. Given the stickiness and difficult transferability of these assets, firms have to engage in long-term relationship to be able to benefit from the partner's assets. It should be then interesting to identify how these alliance networks can help understand the positioning of firms in the strategic asset space.

The structure of alliance networks

There have been several studies of alliance networks. By looking at the boundaries of the network studied, we can differentiate two different kinds of studies. The first limits the boundaries of the network to firms that can be considered to play similar roles in the economic process (Nohria and García Pont, 1991). The second includes firms that have different roles in the economic process. In the first case, firms belong to the same industry and can be considered, to a certain extent to be competitors or potential competitors. In the second case, firms in the network belong to related industries, but are not considered competitors in the strict sense. While both types of alliance network studies have implications for industry analysis we will focus in this paper on alliance networks among incumbent firms within an industry.

Among the first studies there are four that share some characteristics. Walker (1988), Nohria and García-Pont (1991), Ray (1992), García-Pont and Lessard (1992), Vanhaverbeke (1995), look at the competitive characteristics of their industry of the overall alliance network. Except for Walker, all of them look for the grouping of firms around the concept of strategic blocks or firms that have direct ties among them that are denser than their ties with the other firms in the network. The number of firms in the different studies varies depending on the criteria of the researcher and the characteristics of the industry. It is important to enter in one specific consideration in the study on alliances in the RISC market, their network includes firms in three different SIC defined industries, computer manufacturers, software manufacturers and microprocessor manufacturers, and some of them than can be considered to be in all three industries. The characteristics of this industry are such that it is all but impossible to completely differentiate among these firms, first because the industry is such that a large number of these firms can be considered to be present in the three industries at the same time. Second, because, the three are so complementary that it does not make sense to consider one in isolation of the other.

In all these industries strategic blocks have been formed. Strategic blocks have been said to result of the effort of groups of firms to match the collective capabilities of other groups of firms (Bartlett and Ghoshal, 1991). Let me describe a little bit the findings of these studies. Nohria and García-Pont (1991), in their study of the automobile industry find that the network of linkages in the automobile industry can be meaningfully partitioned into several strategic blocks. They find two kinds of blocks, complementary blocks where firms have different sets of complementary strategic assets and pooling blocks where firms have several strategic assets. Table 1 shows the result of their network analysis. The complementary index measures the degree to which a block is complementary versus pooling, looking at whether firms in the same

strategic block belong or not to the same strategic group, defined in terms of the strategic capabilities of the firm (Nohria and García-Pont, 1991). Figure 4 shows the summary mapping of the linkages between automotive manufacturers.

Table 1

Strategic blocks in the Automobile Industry (Nohria and García-Pont, 1991)

Strategic Blocks

1. Alfa Romeo, Ferrari, Fiat, PSA, Renault, Volvo
2. BMW, Honda, Rover, Yue Long
3. Ford, Jaguar, KIA, Lio Ho, Mazda, Nissan
4. Daewoo, Daihatsu, Fuji, GM, Isuzu, Lotus, Saab, Suzuki, Toyota
5. AMC, Chrysler, Daimler-Benz, Hyundai, Lamborghini, Mitsubishi, Maserati
6. Porsche, Seat, VW

Density Matrix (density = 0.089)

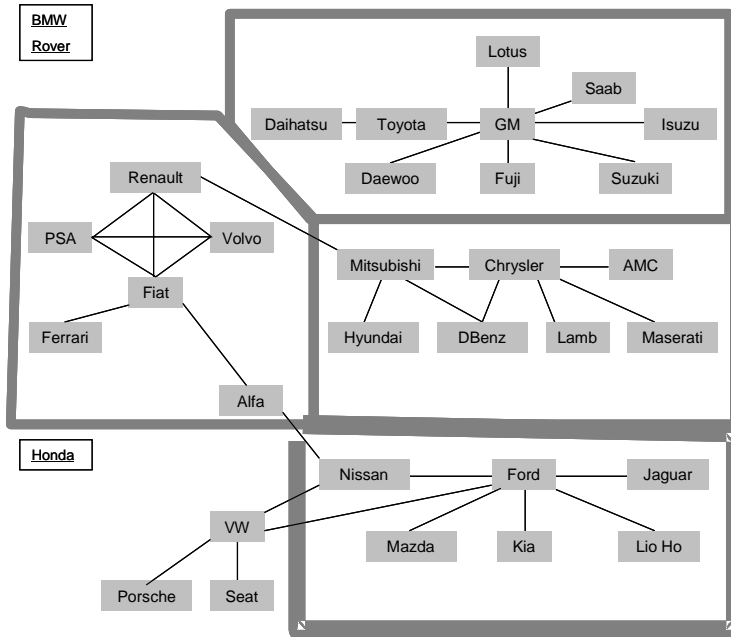
S. Block	1	2	3	4	5	6
1	0.467	0.000	0.028	0.056	0.095	0.222
2	0.000	0.167	0.042	0.000	0.000	0.000
3	0.028	0.042	0.400	0.037	0.024	0.167
4	0.056	0.000	0.037	0.278	0.016	0.037
5	0.095	0.000	0.024	0.016	0.333	0.048
6	0.222	0.000	0.167	0.337	0.048	0.667

Image Matrix Cut Off Value = 0.089

S. Block	1	2	3	4	5	6
1	1	0	0	0	1	1
2	0	1	0	0	0	0
3	0	0	1	0	0	1
4	0	0	0	1	0	0
5	1	0	0	0	1	0
6	1	0	1	0	0	1

Figure 4

Strategic Blocks in the Automobile Industry 1992



García-Pont and Lessard (1992) in their study in European Banking define the boundaries of the network as the 200 largest European Banks. As can be seen in Figure 2, there was a first wave of linkage formation in the European Banking sector in response to the coming of Europe 1992. A magic date when barriers for capital, goods and people flow would be eliminated among the European Union countries. Their study includes linkages until July 1992. One hundred and eight firms were identified to have some type of linkages. They identified eight strategic blocks. However the intrablock density in this banking study was much lower than in the previous one on the automobile sector (see Table 2).

Table 2

Comparison between the banking and the automobile case

	Average Diagonal Density	Average Freeman's Graph Centralization	Average Complementarity Index
World Automotive Industry	0.429	0.825	0.755
European Banking	0.337	0.474	0.354
Difference	0.092	0.351	0.401

The results for the Airline Industry in 1992 (Ray, 1992) are of similar nature, he classifies the 29 firms considered into strategic blocks. He uses as strategic assets the main routes covered by the different airlines.

Table 3

Strategic blocks in the Airline Industry (Ray, 1992)

	Block							TOTAL
	1	2	3	4	5	6	7	
North America	Canadian AL	American	United	Delta	Eastern	Continental	US AIR	11
	Pan AM	Air Canada			Northwest		TWA	
Europe	Aeroflot		Alitalia	British AW	KLM	Air France		9
			Iberia	Swissair		Lufthansa		
						SAS		
Asia-Pacific		Qantas		Singapore	Korean	Thai Int.	All Nippon	8
		Japan AL						
		Cathay Pacific						
		Air NZealand						
Latin America		Varig						1
Caribbean								
Africa								
Middle East								
#Lines/Block	3	7	3	4	4	5	3	29
#Regions/Block	2	3	2	3	3	3	2	

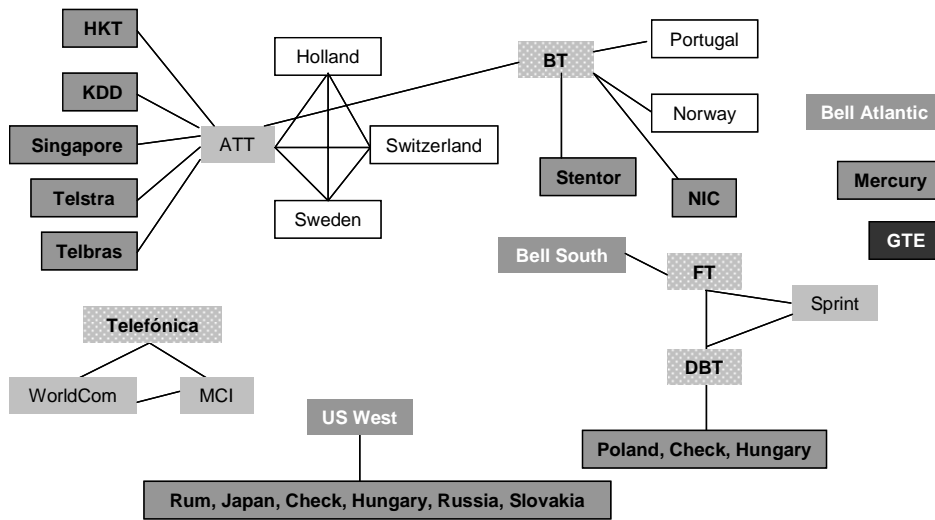
Similarly for the Risk market, Vankaderbeke (1995) classifies the firms into strategic blocks. This last case is significant because the matching of capabilities between blocks is clearer. In an industry fight for standard setting, the key assets or capabilities are the three necessary legs for setting industry standards, software, computers and microprocessors. In his results, he finds software, computer and microprocessor firms in each one of the main blocks identified. In this particular setting, we can affirm that there is block to block competition, and the RISC industry is not composed of a number of different firms, but a number of strategic blocks competing with one another.

The case of telecommunications operators is still going on right now, so it is much more difficult to look at the final block configuration of the industry. However, several blocks come out (see Figure 5). The first one is centered on ATT and British Telecom. A second one is around France Telecom and Deutsche Telecom. A third one includes WorldCom, MCI and Telefónica de España. The recent merger of Baby Bell operators is creating another block³.

³ Sources are the Telefónica case mentioned above and press reports.

Figure 5

Summary of Alliances among Telecommunications operators



These five industries have seen or are seeing the formation of strategic blocks, which are the results of all types of linkage formation within the industry, from mergers or acquisitions to joint ventures and even distribution agreements.

In this way, the studies of intraindustry alliance networks provide with evidence of the formation of strategic blocks within an industry, which is a new way to look at industry configuration.

The whole logic of a strategic block rests on the resource-based view of the firm. Under this perspective, a firm is a bundle of strategic assets that provide its long term competitive positioning. Industry shocks, creates an opportunity structure for the formation of linkages. The industry shock creates uncertainty with respect to the specific strategic assets that will be key competitive weapons in the new situation. Strategic linkages are formed as a response to the market imperfections for these resources.

For the individual firm, the reason to be in a block, besides the specific benefits of individual linkages, is to have access to the strategic assets of the firms involved. There will be block to block competition if the blocks are cohesive enough to be able to produce some type of collective action in terms of asset development and sharing, even though the firms might be competing openly in the market place.

In order to be able to asses whether there is block to block competition we will have to look at the specific characteristics of the blocks that make this possible.

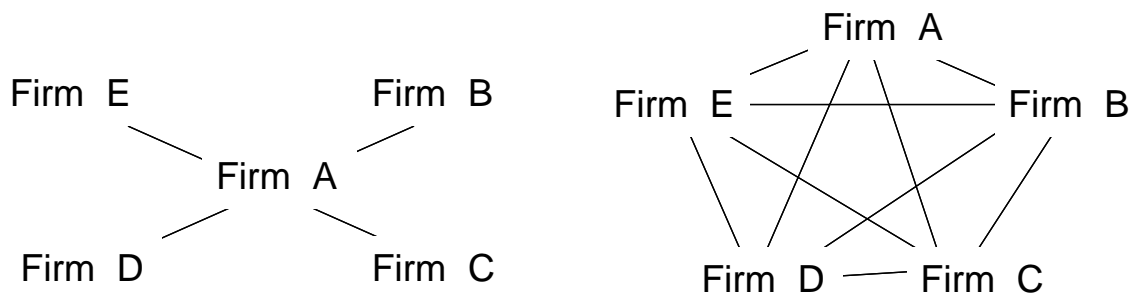
The structure of the strategic block

The structure of the block can be analyzed along two different dimensions, the composition of the block and the prominence within the block.

1. Composition of the block. The genesis of the block derives from the establishment of linkages among different or similar firms. In their study of the automobile industry Nohria and García-Pont (1991) identified two types of blocks, pooling blocks, where firms share similar strategic asset endowments and complementary blocks, in which firms differ in their strategic asset endowment.
2. Prominence within the block. Blocks also vary to the extent to which one or more firms play a focal or central role. One can think of a continuum in which one end is defined by star structure in which all the firms are tied to one central firm and have no ties with each other, a pure star block. The other end would be composed of a fully connected clique where all firms are tied to each other (see Figure 6).

Figure 6

Network structure of the block



The different structures of the strategic blocks have different consequences in terms of identifying strategic block competition. The star structure is mainly associated with complementary blocks, given that it is the strategic importance of the central firm that takes the initiative in establishing the linkages. The clique structure is associated with pooling blocks where linkages include more than one firm that pooled their resources together to improve their collective situation in specific aspects (R&D, scale, etc.). Pooling blocks are less prone to have a learning orientation given that firms within these blocks are similar to each other, and even though there might be some collective learning going on, there can not be significant interpartner learning.

The star structure identifies power asymmetry within the blocks, while the clique structure identifies power parity within the block. Star structures facilitate block to block competition, given that central firms in each block, de facto, coordinate block strategy.

A clique block structure makes it more difficult to have block to block competition given the power parity among block members. This implies that unless the linkages among the firms in the block are quite strong, firms will be oriented towards developing their individual strategies given the difficulties of developing a collective strategy among equals.

The previous discussion indicates that certain block structures have more potential to create block to block competition within an industry. However, these block structures are moderated by the characteristics of the individual linkages that have originated them, which is the topic of the next section.

The characteristics of individual linkages

The fact that two firms belong to the same block does not imply that they are going to develop joint market strategies. However, given the framework in which we are operating it implies that they are sharing some strategic assets. Access to the partner's strategic assets is neither instantaneous nor miraculous. When General Motors forms its Nummi⁴ joint venture with Toyota, it does not implicate that suddenly General Motors has acquired all those manufacturing capabilities that Toyota has, but it has a greater access to acquiring those manufacturing 'strategic assets' than otherwise or at least has an option to acquire them. On the other hand, in the alliance between Banco Santander and Royal Bank of Scotland in the late 80s, Banco Santander gets access to the knowledge that Royal Bank of Scotland has developed in a much more sophisticated financial system which it can apply to the less sophisticated Spanish financial system. Most alliances in the biotechnology industry are a lot more restricted. Cooperation between a large pharmaceutical firm a small biotech start-up is usually restricted to specific research projects. Thus, the strategic asset flow is more concrete and constrained to the specific research project they deal with.

In the network formed by firms in the microprocessor, computer and software firms in the RISC sector, firms put together all their competitive pooled strategic assets in the search for standards fixing.

It can be seen that the degree to which two partners have access to their respective strategic assets depends on the characteristic of their concrete relationship, to the degree of intimacy that they have achieved through their alliance. In the Nummi joint venture, partners had very clearly stated to which degree they were going to exchange resources and knowledge.⁵ On the parallel relationship between Ford and Mazda, the situation was quite different. The strength of the relationship implied that much more resources and knowledge could be shared.

Two are the characteristics of the linkages that give cohesiveness to the block. The first one is the irreversibility of the linkages. The more irreversible are those linkages the more stable the block is going to be. Irreversibility is determined either by the existence of specific assets involved in the alliance or by the legal form the alliance has adopted. Irreversibility is the extent to which partners invest in linkage specific assets, creating strategic interdependence. Asset specificity refers to the degree to which partners in a transaction make investments that cannot be redeployed, and that only have value within the specific relationship. Asset specificity reduces the likelihood of ex-post opportunism, creating a mutual hostage position with reduces the incentive to shirk and increases the stability of the linkage. Asset specificity has been identified as the most relevant characteristic of a transaction.

The comparison between the automotive, the European Banking Industry and the Airline Industry is significant in terms of illuminating the importance of irreversibility of linkages in establishing block to block competition. The automotive industry is such that a large number of the linkages involve specific strategic assets in manufacturing or R&D. This implies that blocks should be more stable. Comparing the structure of the blocks identified by Nohria and García-Pont with the actual one, one can see that there has not been a huge amount of variation. In the Banking Industry, a large number of the linkages where 'Most Favorite Nation' agreements, which do not imply specific investments. The actual structure of the blocks has changed. As an

⁴ Joint production of automoviles in Freemont, Ca.

⁵ For example, the joint venture agreement specified the number of General Motors engineers that could be rotated through the joint venture.

example one can look at the Europartners alliance between Banco Hispano Americano, Banca di Roma, Commerzbank and Crédit Lyonnais. Given that low level of irreversibility of the blocks, changes in strategy dismantled it, with no damage to the actual business.

In the airline industry, the blocks that were based in stock holdings have been maintained, while those based only in code sharing agreements have been in danger and some have died.

The second characteristic of the linkage that provides cohesiveness to the strategic block is the breadth of the relationships among pairs of firms in the industry. The breadth of a relationship indicates the scope of business activities covered by the alliance. This breadth of purpose needs not to be symmetric. What for a large pharmaceutical firm is a very narrow purpose alliance, for a small biotech start-up might be all its operations. Moreover, this breadth of purpose needs not to be fully specified a priori. In the case of the alliance between Banco Santander, a leading Spanish bank, and Royal Bank of Scotland, the cross-holding of minority shareholdings provides an opportunity for collaboration in issues not previously specified.

This breadth of purpose is not a single linkage phenomenon. Two firms are more likely to establish an alliance if they have a prior history of alliances (Gulati, 1995). Ford has more than seven different alliances with Mazda. General Motors has six different alliances with Isuzu. Chrysler and Mitsubishi had more than four alliances going on at the same time. PSA and Renault had seven alliances between them.

The more irreversible the linkages in the block are the more likely there is going to be some form of collective strategic block action. Similarly, the broader the purpose of the linkages that configure a block is the greater the possibility of collective action within a strategic block.

The dynamics of block formation

In the previous section we have examined the extent to which the structure of an industry can be identified in terms of strategic blocks or groups of firms closely linked together. For the individual firm, this issue has a dynamic implication. The emergence of blocks is the consequence of a dynamic series of strategic linkages among firms. The establishment of linkages is nothing but another move in the competitive game. The individual firm has to acknowledge the kind of game that it is immersed in and identify its rules. It is the emerging network that progressively orients the choice of partners (Gulati and Gargiulo, 1997). This section will identify these rules following Nohria and García-Pont (1991).

Rule 1: Watching the leader. It is clear that close competitors watch each other closely. Firms that have similar sets of strategic assets are likely to be close competitors. Thus, when a first mover makes a complementary alliance, is potentially leaving behind its most direct competitors by gaining access to strategic assets it did not have. Thus similar firms will have an incentive to imitate the cooperative strategy of the first mover (García-Pont and Nohria, 1997).

In this way, the three American Automobile producers developed alliances with major Japanese producers. General Motors had an alliance with Toyota, Ford with Mazda and Nissan and Chrysler with Mitsubishi. In the airline industry, major European firms developed alliances with American Airlines.

Rule 2: The exclusivity of the linkage. Once a firm has established a strong linkage with another firm, it is not completely free to establish linkages with other firms. The relationship

between ATT, British Telecom, MCI, Worldcom and Telefónica is a recent example. British Telecom had 20% of MCI, both had signed an agreement with Telefónica in international business. When WorldCom takes over MCI, the alliance with British Telecom is Broken, Telefónica has to take sides, and does it with MCI, the operator that has more interest in the Latin-American market. British Telecom has free way in the US and signs in an agreement with AT &T.

Exclusivity serves as a credible signal of fealty and commitment reducing opportunistic behavior. Once two firms have established a significant relationship between them, the range of opportunities for the establishment of other linkages has been constrained by the existing ones. The 'blocking' effect of the exclusivity rule is indirectly defining the cooperative strategy of other firms in the industry. The norm of exclusivity is relaxed in three cases. The first one is when there is one firm that has relatively more power, and then it can insist on exclusivity without promising return on it. The second is when there are different spheres of influence, so that different levels of competition, as in the pharmaceutical industry, where exclusivity can be enforced within each therapeutic category, can separate cooperative strategies. Finally, exclusivity may also not be insisted upon if the scope of the linkages is very minor and highly specific.

Rule 3. The third rule is that of completeness. Once a firm has chosen a complementary of pooling strategy, it has to follow on with it. It would be difficult to justify that you are pooling with ones and complementing with others, especially in industries with small number of players. In this way, one can see how, the European Automobile producers, PSA, Renault, Fiat and Volvo develop a web of linkages among them.

Discussion and conclusion

We have seen in recent years the emergence of waves of alliances among competitors or potential competitors within an industry. These waves of alliances have not had implications in the way we look at industry structure. However, several studies have been looking at the networks of alliances within industries. Several of these studies have identified the existence of strategic blocks within industries. Strategic blocks are sets of firms more densely linked to each other than with the rest of firms in the industry. Strategic blocks are said to be the result of the effort of groups of firms to match the collective capabilities of other groups of firms.

Strategic blocks can be said to provide an overlying structure on our understanding of industry analysis. This structure helps us explain the structure of the industry in terms of the distribution of the strategic assets in the industry, which is the key for the long-term competitiveness of the individual firms. Given that alliances are a way to access strategic assets of the partner, the formation of strategic blocks provide a mean for individual firms to access the strategic assets of the members of the block.

Strategic blocks create an opportunity for further strategic coordination for the firms in the industry, both at the product-market and at the strategic asset level. Whether this further coordination exists is a function of the structure of the strategic blocks and the characteristics of the individual blocks that have originated them.

Strategic blocks can be thought within a continuum form the star to the clique structure. The more close to the star structure the more possibilities for collective action among the member

firms. This is so because the center firm has usually more power and can force strategies on the rest of the firms.

The more irreversible the linkages among the member firms in a block, the more possibilities for collective action. The broader the purpose of the relationships among member firms in the block the more possibilities for collective action.

The dynamics of network formation have its implications for the development of a firm's cooperative strategy. A firm's cooperative strategy is not developed in isolation but it is constrained by the cooperative strategies of its competitors. Any kind of linkage established by a firm in its industry shapes the cooperative strategy of other firm's in the industry through the exclusivity rule and the leader's imitation phenomena. Firm's can exercise industry leadership in their cooperative strategy by being first movers.

The objective of this paper was to throw a little light on the impact of alliances on industry structure. By emphasizing the structure of the industry in terms of the distribution of strategic assets we have provided a framework to look at long-term industry competition. We do not intend to eliminate traditional industry analysis but to complement it through the introduction of the concept of strategic blocks.

References

- Ahuja, G. (1996), 'Collaboration and innovation: A longitudinal study of interfirm linkages and firm patenting performance in the global advanced material industry', dissertation, University of Michigan Business School.
- Aiken, M. and J. Hage (1968), 'Organizational interdependence and intra-organizational structure', *American Sociological Review*, 33, pp. 912-930.
- Amit, R. and P. Shoemaker (1993), 'Strategic assets and organizational rent', *Strategic Management Journal*, Vol. 14 (1), pp. 33-46.
- Barley, S.R. (1986), 'Technology as an occasion for structuring: Evidence from observations of CT scanners and the social order of radiology departments', *Administrative Science Quarterly*, 21, pp. 78-108.
- Bartlett, C. and S. Ghoshal (1991), 'Introduction', *Strategic Management Journal*, special issue on global strategy, summer 1991.
- Barley, S. R., J. Freeman and R. C. Hybels (1992), 'Strategic Alliances in Commercial Biotechnology', in N. Nohria and R. Eccles (eds.), *Networks and Organizations: Structure, Form and Action*, Harvard Business School Press, Boston, MA, pp. 311-347.
- Barney, Jay (1991), 'Firm resources and sustained competitive advantage', *Journal of management*, 17 (1), pp. 99-120.
- Barney, J. B. (1995), 'Looking inside for competitive advantage', *Academy of Management Executive*, 9 (4), pp. 48-61.
- Barney, J. and R. Hoskisson (1990), 'Strategic Groups: Untested assertions and research proposals', *Managerial and Decision Economics*, 11, pp. 187-198.
- Burgers, W. P., C. W. L. Hill and W. Cham Kim (1993), 'A Theory of global strategic alliances: The case of the Global Auto Industry', *Strategic Management Journal*, Vol. 14 (6), pp. 419-432.
- Burt, R. S. (1992), 'Toward a structural theory of action', Academic Press, New York.
- Burt, R.S. (1997), 'The contingent value of social capital', *Administrative Science Quarterly*, 42, pp. 339-365.
- Caves, R. and M. Porter (1977), 'From Entry barriers to Mobility barriers', *Quarterly Journal of Economics*, 91, pp. 241-261.
- Cool, Karel and James Henderson (1997). 'Factor and regression Analysis, Power and Profits in Supply Chains', chapter 1 in *Statistical Models for Strategy Research*, M. Ghertman, J. Obadia and J. Arregle (eds.), Kluwer Academic Publishers, Dordrecht, The Netherlands, pp. 1-28.
- Dierickx, I. and K. Cool (1989), 'Asset stock accumulation and sustainability of competitive advantage', *Management Science*, Vol. 35 (12), pp. 1504-1511.

- Enrione, A. and C. García-Pont (1995), 'Asset-based competition and industry structure: Recapturing the early concepts of strategic groups', paper presented at the 1995 Strategic Management Society Conference. IESE's Research paper N°. 286.
- García-Pont, C. and D. R. Lessard (1992), 'Alliance Networks in European Banking', paper presented at the Strategic Management Society Conference, Toronto, Canada.
- García-Pont, C. and N. Nohria (1997), 'Global vs. Local Mimeticism: The dynamics of linkage formation in the Automobile industry', Paper presented at the Academy of Management Annual Meeting, Boston, MA.
- Fingembaum, A. and H. Thomas (1990), 'Strategic groups and performance: The US insurance industry', *Strategic Management Journal*, 11, pp. 197-215.
- Grath, Deepika and Thomas S. Gruca (1997), 'Convergence across alternative methods for forming strategic groups', *Strategic Management Journal*, Vol. 18 (9), pp. 745-760.
- Gulati, R. (1995), 'Social Structure and alliance formation Pattern: A longitudinal Analysis', *Administrative Science Quarterly*, 40, pp. 619-652.
- Gulati, R. (1997), 'Which firms enter into alliances? An empirical assessment of financial and social capital explanations', working paper, J.L. Kellogs Graduate School of Management, Northwestern University.
- Gulati, R. (1998), 'Alliances and Networks', *Strategic Management Journal*, Vol. 19, pp. 293-317.
- Gulati, R. and M. Gargiulo (1997), 'Where do interorganizational networks come from?', working paper, INSEAD.
- Hamel, G., Y. L. Doz and C.K. Prahalad (1989), "Collaborate with your competitors and win", *Harvard Business Review*, Jan.-Feb. 1989, pp.133-139.
- Hennart, Jean-Francois (1994), 'The Comparative Institutional Theory of the firm: Some implications for corporate strategy', *Journal of Management Studies*, Vol. 21- N° 2, pp. 193-207.
- Hergert, M (1987), "Causes and Consequences of strategic grouping in the US manufacturing industry, 1952-1971", *Academy of Management Journal*, 21, pp. 592-610.
- Hunt, M. (1972), 'Competition in the Major Home Appliance Industry, 1960-1970?', Unpublished doctoral dissertation, Harvard Business School, Harvard University, Cambridge, Mass.
- Koh, J. and N. Venkatraman (1991), 'Joint venture formation and stock market reaction: An assessment in the information technology sector', *Academy of Management Journal*, 34 (4), pp. 869-892.
- Kogut, B., W. Shan and G. Walker (1992), 'The make-or-cooperate decision in the context of an industry network', in N. Nohria and R. Eccles (eds.), *Networks and Organizations*. Harvard Business School Press, Cambridge, MA, pp. 348-365.
- Kogut, Bruce, Weijian Shan and Gordon Walker (1994), 'Knowledge in the network and the network as Knowledge'. In G. Grabner (ed.), *The embedded Firm*, London, UK: Routledge.

- Larsson, Rikard, Lars Bengtsson and Kristina Henriksson (1997), 'The Interorganizational learning dilemma: Collective Knowledge Development in strategic Alliances', paper presented at the INSEAD/Organizational Science Conference in Fontainebleau, France, 1997.
- Levine, S. and P. E. White (1961), 'Exchange as a conceptual framework for the study of interorganizational relationships', *Administrative Science Quarterly*, 5, pp. 583-601.
- Lewis P. and H. Thomas (1990), 'Linkage between strategy, strategic groups and performance', *Strategic Management Journal*, 11, pp. 385-397.
- Madhavan, Ravindranath, Balaji R. Koka and John E. Prescott (1998), 'Networks in transition: How industry events (re)shape interfirm relationships', *Strategic Management Journal*, Vol. 19 (5), pp. 439-459.
- McGahan, Anita, M. and Michael E. Porter (1997), 'How much does industry matter, really?', *Strategic Management Journal*, Vol. 18, Summer Special Issue, pp. 15-30.
- Mizruchi, M. S. (1992), 'The Structure of Corporate Political Action', Harvard University Press, Cambridge, MA.
- Nath, Deepika and Thomas S. Gruca (1997), 'Convergence across alternative methods for forming strategic groups', *Strategic Management Journal*, Vol. 18 (9), pp. 745-760.
- Newman, H. (1978), 'Strategic groups and the structure-performance relationship', *Review of Economics and Statistics*, 60, pp. 417-427.
- Nohria, N. and C. García-Pont (1991), 'Global Strategic Linkages and industry structure', *Strategic Management Journal*, Summer Special Issue, 12, pp. 105-124.
- Nohria, N. and R. Eccles (eds.) (1992), 'Networks and Organizations', Harvard Business School Press, Cambridge, MA.
- Oster, S. (1982), 'Intraindustry structure and the ease of strategic change', *Review of Economics and Statistics*, 60, pp. 417-427.
- Penrose, E.T. (1959), 'The Theory of Growth of the Firm', Oxford University Press.
- Pfeffer, J. and P. Nowak (1976a), 'Joint ventures and interorganizational interdependence', *Administrative Science Quarterly*, 21, pp. 398-418.
- Pfeffer, J. and P. Nowak (1976b), 'Patterns of joint venture activity: Implications for antitrust policy', *Anti-trust Bulletin*, 21, pp. 315-339.
- Porter, Michael E. (1979), 'The structure within industries and company performance', *Review of Economics and Statistics*, 61, pp. 214-227.
- Porter, Michael E. (1980), 'Competitive Strategy', The Free Press, New York, NY.
- Powell, W. W. and P. Brantley (1992), 'Competitive cooperation in Biotechnology: Learning through networks', in N. Nohria and R. Eccles (eds.), *Networks and Organizations*, Harvard Business School Press, Cambridge, MA, pp. 366-394

- Powell, W. W., K. Koput and L. Smith-Doerr (1996), 'Interorganizational collaboration and the locus of innovation: Networks of learning in biotechnology', *Administrative Science Quarterly*, 41, pp. 116-145.
- Provan, K. G. (1982), 'Interorganizational linkages and influence over decision making', *Academy of Management Journal*, 25 (2), pp. 77-86.
- Ray, P. (1992), 'Strategic Alliances in the Airline Industry', Master thesis, Sloan School of Management, Massachusetts Institute of Technology
- Rumelt, Richard (1991), 'How much does industry matter?', *Strategic Management Journal*, 12, pp. 167-185.
- Schmalensee, Richard (1985), 'Do markets differ much?', *American Economic Review*, 75, pp. 341-351.
- Shan, W. (1990), 'An empirical analysis of organizational strategies by entrepreneurial high-technology firms', *Strategic Management Journal*, 11 (2), pp. 129-139.
- Uzzi, B. (1996), 'The sources and consequences of embeddedness for the economic performance of organizations: The network effect', *American Sociological Review*, 61, pp. 674-698.
- Vanhaverbeke, W. (1995), 'Innovation and Competition; R&D, Global Diversification and Networking Strategies', Unpublished Doctoral dissertation, IESE, University of Navarra, Barcelona, Spain.
- Walker, G. (1988), 'Network analysis for cooperative interfirm relationships', in F. Contractor and P. Lorange (eds.), *Cooperative Strategies in International Business*. Lexington Press, Lexington, KY, pp. 227-240.
- Wernerfelt, B (1984), 'A Resource-based view of the firm', *Strategic Management Journal*, Vol. 5 (2), pp. 171-180.
- Whetten, D. A. and Th. K. Leung (1979), 'The instrumental value of interorganizational relations: Antecedents and consequences of linkage formation', *Academy of Management Journal*, 22 (2), pp. 325-344.
- Zaheer, A. and S. Zaheer (1997), 'Catching the wave: Alertness, responsiveness and market influence in global electronic networks', *Management Science*, 43 (11), pp. 1493-1509.