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Co-operation in a Niche Market: The Case of Fiat and PSA in Multi Purpose Vehicles

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Stimulated by the success of Renault in Europe and Chrysler in North America, PSA and Fiat decided to enter the emerging *multi purpose vehicle* market by forming an alliance to design, develop and manufacture an entirely new vehicle.

The study of this case shows that the narrowness of this segment combined with a growing entry cost reduce the possibility of autonomous moves. As a consequence, the alliance has mainly been designed for sharing investments and risks, and for gaining economies of scale in a joint plant. As such, it offers a typical example of a scale alliance. However, we stress that those benefits are counterbalanced by the fact that when the allies go back to competition for commercialising the vehicles in their respective distribution networks, they offer quite similar products. It shows how far scale alliances are constraining (for example, reducing industrial diversity) and reduce the span of differentiation.

The two partners agreed to entrust PSA with the day-to-day management of the alliance. As Fiat has similar responsibility for a previous ongoing alliance with PSA in light trucks, the new deal in multi purpose vehicles allowed the two partners to balance their respective powers and to create mutual dependence between themselves. This organisational form demonstrates how it is possible to solve classical problems in alliance management, that is, to limit the probability of opportunistic behaviours. This case also shows that dedicating the management of the alliance to one partner notably prevents the partners from learning from each other.

PSA and Fiat are two European car manufacturers each producing more than two million vehicles per year. In 1988, they decided to join forces in order to enter into the emerging *multi purpose vehicle* (MPV) market. Six years later, after jointly committing 5 billion francs (US $1 billion) in the design, development and testing of a completely new MPV model and investing together 6 billion francs (US $1.2 billion) in an entirely new factory dedicated to this vehicle, the two partners started to penetrate the segment. However, co-operation ends at the factory's door and the partners go back to competition at the commercialisation stage. In Europe, auto-makers usually co-operate on specific sub-systems, i.e. engine, gear-box, even power-trains or platforms, but rarely on the whole vehicle (Henault, 1996). The magnitude of the deal, the lack of experience of the two partners in the MPV field (no more than technical scanning) and the profiles of the two allies (private companies where the equity is mainly held by families) make the move remarkable.

The objective of this paper is to use the PSA-Fiat case for drawing lessons with respect to alliance management. The study is based on in-depth interviews with general managers at PSA and Fiat, industry experts[2] and an extensive business and specialist press review. Some well-documented cases have also been used for comparison. Our analysis allows us to infer four lessons that will be developed in the text:

1. the decision of PSA and Fiat to co-operate has been influenced largely by the uncertainties resulting from the small size of the emerging MPV segment in Europe and the growing cost of entry in this new field;
2. this deal offers a typical example of a scale alliance (according to the definitions usually used in the inter-firm alliance literature), where most decisions have been constrained by this objective;
3. benefiting from scale effects at the development and

the manufacturing stages is nevertheless counter-balanced by a weak differentiation between products distributed through four distribution networks under four different brand names;

4. the allies have found a very interesting way to preclude opportunistic behaviours (which are a typical problem in alliance management) but which do not allow one ally to learn from the other.

The conjunction of these two innovations leads to MPV cars showing the following feature: a modular passenger cell with a large capacity for people (up to 7 or 8 seats) and/or luggage, tools or leisure equipment. This definition positions the vehicle between the van and the private car (sedan type). Those vehicles increasingly tend to adopt an unbroken body (usually egg-shaped) from the radiator grill to the rear window.

At the first introduction of the MPV concept, few car manufacturers were confident in its development. The uncertainty was more related to the level of demand (in view of the newness of the concept) than to technological considerations. It was especially true for PSA and Fiat. At the beginning of the 1980s, PSA — which was losing money — even turned down the offer of Matra-Automobiles to form an alliance on its MPV project (and preferred to invest in a smaller car of its own — the 205).

Arrival of New Entrants

As the success of Chrysler with its mini-van in North America and Renault with its Espace in Europe became more and more manifest, car manufacturers absent from the segment began to realise that this absence caused a real lack in their product portfolio compared to other competitors. PSA and Fiat, in particular, were surprised by the success of their competitors with these kinds of products.

Since the birth of the MPV concept, the North American market has shown the largest mini-van volumes in the world. At the end of the 1980s, mini-van sales grew by 15 per cent per year; they even doubled between 1990 and 1993. The success of Chrysler revealed the attractiveness of the segment. No fewer than 20 models[3] are now offered on the North American market. The total market now exceeds one million vehicles per year (about 10 per cent of the car market).

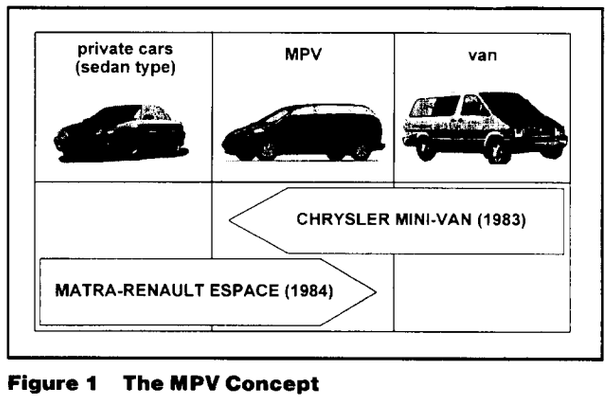

Figure 1 The MPV Concept

A Relatively Narrow Segment in Europe with a Growing Entry Cost

The text will first cast a light on the life cycle of the MPV segment. We will see that the birth phase of the MPV has been driven both by Chrysler in North America and by Matra-Renault in Europe. These two innovative pioneers largely contributed to the definition of this new vehicle concept and took notable advantage of their advance. The growth phase has been sustained by a flow of new entrants — once the concept gained recognition — attracted by the higher growth rate of this segment (compared to the traditional segments of the automobile industry). All these newcomers modified the environmental conditions in the market. Demand has been stimulated by the increasing range of products offered. Simultaneously, pricing is becoming a much more serious issue.

PSA and Fiat clearly belong to the second wave of auto-makers arriving at the growth stage of the product life cycle. They reached the market of MPVs ten years later than Matra-Renault. We will stress that the entry cost at this stage, in a segment that stays as a niche market, is a strong incentive to establish co-operation, that is to spread substantial investments.

Emergence of the MPV Concept

Chrysler is generally recognised to have launched this kind of vehicle at the beginning of the 1980s. At that time, in the context of serious troubles in the North American car manufacturing industry, but also in the company itself, Chrysler had probably been stimulated for innovation. Launched in 1983 on the US market at a price close to that of station wagons, its mini-van has achieved strong commercial success.[4] It is that very success that has surprisingly allowed the company to recover. At its origin, the mini-van is no more than a van (i.e. a utility vehicle) that has been shortened and where windows and seats have been installed — as illustrated in Figure 1. But, the structure of the vehicle stays that of a van: inflexible rear axle, leaf-spring suspension.

In Europe, the MPV concept is usually associated with the Matra-Renault Espace. The concept originated in the car division of the Matra Group at times where this subsidiary was close to bankruptcy. Since its launch in 1984, the car has mainly been manufactured by Matra-Automobiles,[5] but distributed and commercialised by Renault. As the experience of Matra-Automobiles is rooted in the design of sports and recreational cars (produced at very low volumes), it is not surprising that the MPV it designed is closer to sedan type cars than to vans (see Figure 1). Since its birth, the technological

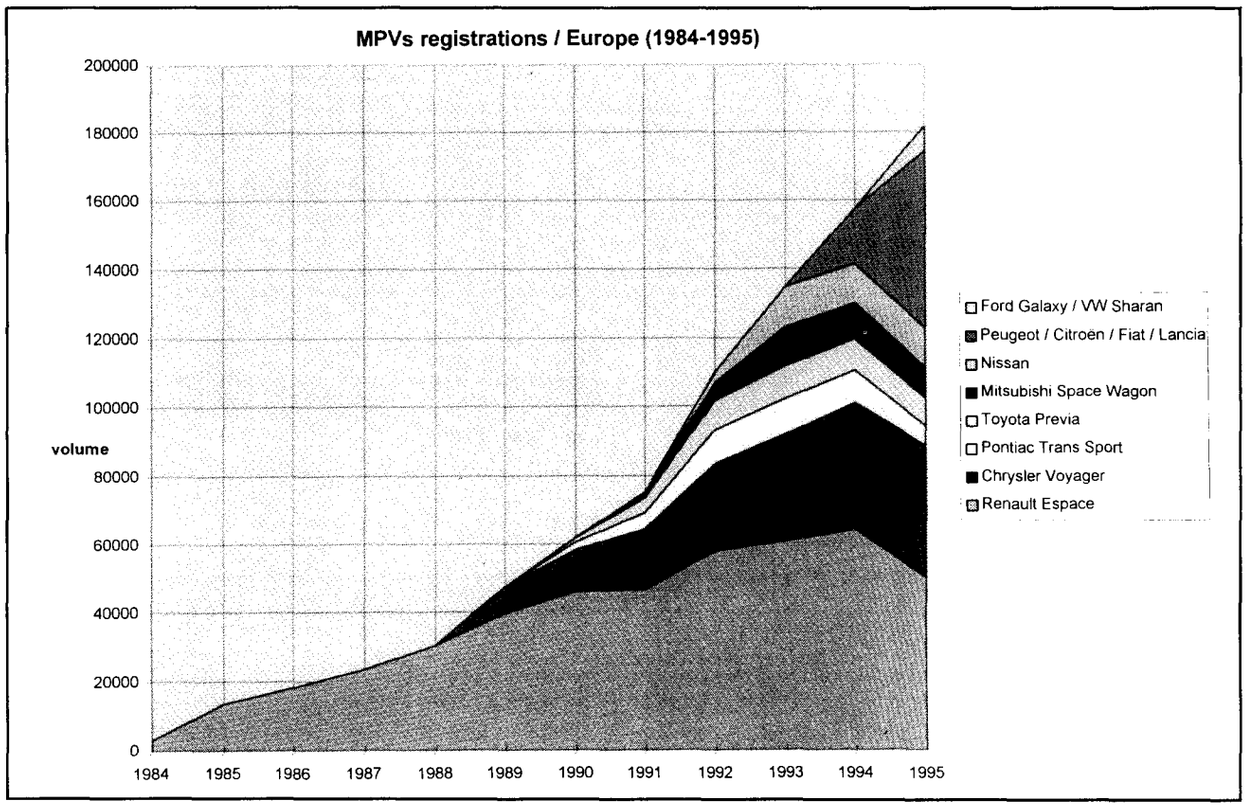

Figure 2 An Increasing Number of Competitors

content of the Espace has been high: body made of composite material (derived from the air and space division of Matra), helical suspension spring, complete modularity of the internal space.

After an emerging phase characterised by a slow take-off, the European MPV market entered a growth phase from the end of the 1980s until now with annual growth rates superior to 20 per cent. The number of units sold went from 62 000 in 1990 to 157 000 in 1994, and even 182 000 in 1995. The market has been heavily dominated by the Matra-Renault Espace since its launch in 1984 — co-challenged by Chrysler since 1988 (i.e. the year where the model arrived for the first time in Europe). Nevertheless, the continuous arrival of new entrants has constantly reduced its market share. Figure 2 shows that at least 12 different trade-marks are now competing in the European area. In this way, new entants make a breach in the leadership of Renault in Europe (the same pattern occurred in North America: the entries of competitors eroded Chrysler's market share).

Part of the demand comes from the station wagon segment and part of the demand has been revealed by the launch of the product. It may be hypothesised that the increase of the demand has been stimulated by the entry of competitors in the segment (combined with a progressive decrease in the price of the product). Furthermore, the offering of new models engenders a potential demand that was not entirely satisfied by the previous offerings.

Changing the Rules

As many competitors entered the market, the segment was no longer in its infancy and entry barriers evolved: the level of the initial investment increased, customers became more sensitive to price issues, and economies of scale became more important. But the production volumes in Europe remain at relatively low levels compared to the volumes that large car manufacturers are used to.[6] Those changing rules incited some companies to combine their efforts. It is noticeable that in this segment, the proportion of alliances is higher than in any other segment in the automobile industry. Besides PSA-Fiat and Matra-Renault, we have for example Ford, Volkswagen and Seat on the European market (with the Galaxy / Sharan / Alhambra MPV) or even on the North American market, Ford and Nissan (with the Quest MPV). Clones have also been developed by large US auto-makers: for example, the Chrysler Town & Country, the Plymouth Voyager and the Dodge Caravan are quite similar mini-vans. How can the choice of PSA and Fiat to co-operate in this segment be further explained?

An Alliance Built for Scale Effects

The literature on interfirm alliances usually makes a distinction between 'scale' and 'complementary' alliances — as shown in Table 1. Even if the vocabulary may change from one author to another, the concept stays the same. Nevertheless, those labels are unsuitable as every alliance is complementary.

Table 1 Two Kinds of Alliances

Joffre	similarity	difference
and Koenig (1984)	cooperation	cooperation
Hennart (1988)	scale JVs	link JVs
Roberts	resource	resource
and Mizouchi (1989)	accumulation	complementing
	ventures	ventures
Dussauge	scale	complementary
and Garrette (1991)	alliances	alliances

That is why we will distinguish hereafter between 'scale' and 'symbiotic' alliances (Adler, 1979). The distinction between these two types of alliances stems from the type of advantages that allies are looking for. The first kind looks at quantitative complementarity ones, while the second looks at qualitative ones. Complementarity scale alliances occur when some firms pool similar resources to save on or to reach a critical mass (otherwise unreachable). Usually, firms forming scale alliances belong to the same industry, show comparable profiles of resources and face the same kind of problems. Several competitors may, for example, join forces to increase their market power so as to promote a standard in their own industry. Symbiotic alliances occur when firms combine resources of a different nature or resources that are held unsymetrically by the partners. Each firm brings a different strength. Usually, firms forming symbiotic alliances belong to different industries or are positioned at different stages of the same business chain; they are not direct competitors. Consequently, their problems are not necessarily identical and the nature of their moves through the alliance is different.

This section will show that the alliance between PSA and Fiat in the MPV segment offers the typical example of a scale alliance. We will see that every feature of the deal, and every decision taken has been devoted to this objective. Moreover, we will stress that the aim of this deal is completely different from other agreements in the same industry.

Looking for Scale Effects

As shown in Figure 3, the PSA-Fiat alliance on MPV is aimed at obtaining scale effects. We will develop these arguments below.

Sharing cost and risk

The point developed in the previous section is that the initial investment required now reached high levels because the sector is no longer in its infancy. It would not have been a problem in high volume segments (such as in the Clio, 106 or Punto range). Considering the relatively small size of the segment of MPVs, i.e. the narrowness of the market in Europe, manufacturers have a strong incentive for co-operation in sharing the design (R&D) and manufacturing costs.

Gaining economies of scale

In the automobile industry, as in many industries, cost decreases with the capacity of the plant. By adding

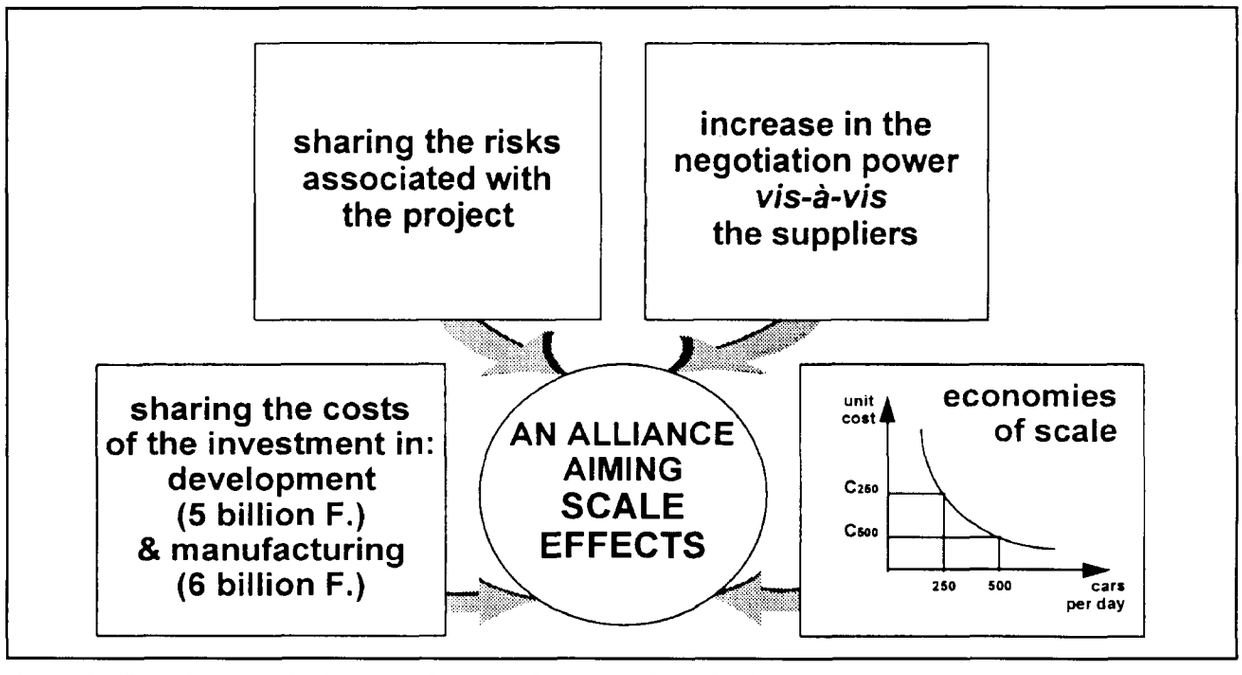

Figure 3 Complementarity between Partners Occurs on Quantitative Aspects

their respective production capacities in the same factory, PSA and Fiat are able to reach a larger scale compared to a situation where they would have run their own plant (see graph in Figure 3). Consequently this co-manufacturing agreement allows the partners to reach together a lower cost of production. The PSA-Fiat plant has been designed to produce 600 cars per day with a break-even point at 350. The agreement specifies a parity of production: 300 MPVs should be directed toward the Peugeot and Citroën networks and 300 should be sold in the Fiat and Lancia networks. The partners even manage to double the production capacity (in the case of a durable increasing market). In this case, they predict they will meet lower production costs.

"The only complementarity of the PSA – Fiat deal is the one between the financial resources brought together by the partners"

Increasing bargaining power

Concerning parts supply, this co-operation increases the negotiation power of the allies *vis-à-vis* the component suppliers. This point is highly relevant as 70 per cent of the value-added is bought from outside.

Nevertheless, it will be emphasised hereafter that reaching this scale forced the two partners to design a model consistent with the four brands and minimising industrial diversity. In addition, the restricted production volumes attached to the production of niche vehicles (especially engines) constrain variety because of cost.

Scale and Symbiotic Effects do not go Hand in Hand!

Symbiotic alliances generally occur between companies with different resource profiles. The case of the co-operative agreement linking Matra-Automobiles and Renault (Garrette and Blanc, 1990) may be cited as an example. The aim of the alliance between Matra-Automobiles and Renault on the Espace MPV is mainly to pool resources of different kinds — the complementarity between partners occurs on qualitative aspects.

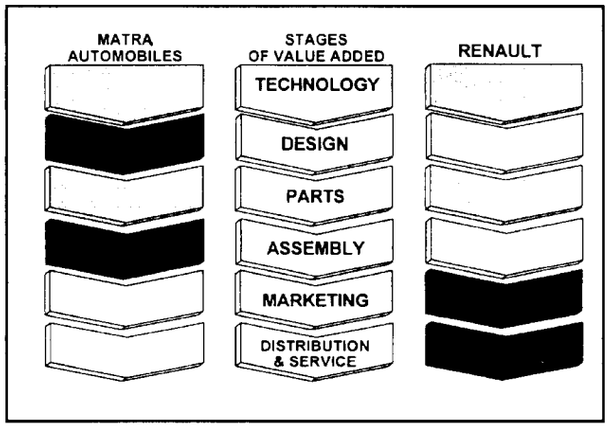

Figure 4 When Complementarity Occurs on Qualitative Aspects. (Adapted from Dussauge and Garette, 1991, p. 15)

On one hand, if Matra-Automobiles is generally recognised as exhibiting a creativity potential, its small size in the car manufacturing industry induces two major competitive disadvantages. First, the company has neither an engine, nor a gear-box of its own; it always purchased these mechanical parts. Second, Matra-Automobiles is obviously not able to run a distribution network of its own. These two shortcomings always forced the company to establish links with larger car manufacturers. On the other hand, if Renault has the complementary assets which Matra-Automobiles lacks, the company had no MPV project similar to that of Matra-Automobiles at the time of the alliance. Despite a few exceptions (such as the Alpine and R30), it is also weak in low-volume car manufacturing expertise.

To put it simply, the two partners distributed tasks between them at different stages of the value added chain relative to their main strengths (see Figure 4). Matra began with the design of the MPV and then took on manufacturing the bodies. It still undertakes today most of the assembly work in its own plant. Renault supplies Matra with mechanical parts (engines and gear-boxes) and is mainly in charge of the marketing, distribution and after-sales services. In designing this alliance, the two companies pooled different kinds of resources in order to overcome their own weaknesses and obtain a complementary mix of qualitatively different resources.

The PSA-Fiat alliance is not symbiotic, as the two companies have comparable profiles of resources and do not suffer from any real lack in one specific area: each one has design competencies, development capabilities, assembly and manufacturing capacities, marketing forces and distribution networks. Their production systems are fairly equal. From a Fordist model, they both invested heavily in automation before adopting Japanese-inspired techniques today. Nevertheless, neither has particular experience in this niche as they are both relatively weak in the upper segments of the automobile market. The only complementarity of the PSA-Fiat deal is the one between the financial resources brought together by the partners.

Problems Arising at the Commercialisation Stage

The rest of the article will explain why the choice of the two allies to distribute and sell the vehicles in their own

distribution networks has been an unavoidable choice. It will then deal with the consequences of a scale alliance at the commercialisation stage.

One MPV, Two Groups, Four Brands

PSA and Fiat chose to join their efforts only on a part of the value chain. They tied their alliance to the design and the manufacturing of an entirely new MPV. This means that the two groups return to competition at the commercialisation stage. The same MPV is sold under four different names: Peugeot 806, Citroën Evasion, Fiat Ulysse and Lancia Zeta in four different networks.[7] If life as a twosome is not easy, one can imagine that life as a foursome is even more difficult!

In fact, the two groups had no real alternative to this choice. It was obviously inconceivable to merge the distribution networks of the two groups (as each group wants to keep its privacy) or to set up *from scratch* a new network. The partners have not been able to integrate their efforts at the commercialisation stage mainly because brand names are central issues in the automobile market. Car brands are probably among the most well known brands and the most rooted all over the world (think of Mercedes-Benz, for example). Each car manufacturer holds a brand equity that it wants to preserve and exploit. Creating a new powerful brand would require huge investments with an unknown return (remember that the rejuvenation of the Talbot trademark after PSA's take-over of Simca was a failure). As a consequence, it would not have been wise to try to launch a new brand.

Assuming the Constraints of a Scale Alliance

The economic advantages of a scale alliance are counterbalanced by strong constraints: the challenge for PSA and Fiat has been to create some differentiation among the four brands (to be perceived by the client) but simultaneously to reduce the industrial diversity.

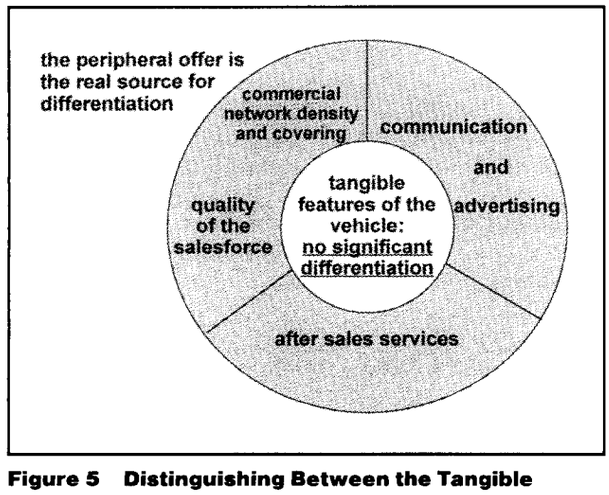

Figure 5 Distinguishing Between the Tangible Product and an Enlarged View of the Offer

In order to minimise development costs, PSA and Fiat chose to design only one project (known as U60) with few distinguishing features. This definition means that the vehicle could not be fitted to the identity or personality (for example, in terms of style) of any the four brands. By defining an average concept, none of the brands could be entirely satisfied. We could even question the ability of the customer to associate these clones to one specific brand, i.e. to identify the brand.

At the manufacturing stage, in order to maximise economies of scale, all the MPVs share the same chassis, the same frame, the same body, the same engines and other mechanical parts. PSA and Fiat agreed on only small differentiation with 90 per cent of the components being common to every MPV. Vehicles only show different lights, radiator grids, bumpers and upholstery. To be clear, that means that one client will find very similar MPVs in a Peugeot, or a Citroën, or even a Fiat showroom; the Lancia Zeta, positioned at the top, is the only one with more significant differences (e.g. its front grid is different). The central point is that introducing more differentiation between models would have been too costly according to the project managers.

To sum up, the tangible features of the vehicle do not offer significant differentiation. Such a weak differentiation among the four brands induces a strong substitutability between the models. Everyone knows that the higher the substitutability between two offers, the higher the probability that competition would switch to price wars. This is probably the strongest risk attached to this alliance. It means that differentiation has to be found elsewhere. The companies could not rely solely on a client's loyalty. As shown in Figure 5, they have to rely on their marketing strategies to differentiate.

A first element will be the density of their distribution network, their delivery time and the quality of the sales-forces. The larger the number of points of sales, the higher the probability for a brand to reach consumers. Differentiation could also be found through the image and reputation created through communication and advertising. Finally, another way to attract clients is the quality of after sales services. As all these peripheral features become more and more important when the MPV reaches its maturity phase, PSA and Fiat may find here an offset to the risk of price wars.

An Interesting Approach to Preclude Opportunistic Behaviour

The benefits that one firm gains in an alliance depend on its own actions, but also, on the actions of its partner. If one ally does not effectively co-operate, trust will be jeopardised and the co-operation will probably cease sooner or later. Hill (1990), Gugler (1991), Koenig and Van Wijk (1992) or Gulati *et al.*, (1994) — relying on game theory — stressed that one central problem in alliance management is finding ways to reduce the

probability of opportunistic behaviour. That is why alliances are frequently considered as unstable and risky forms of organisation. We will see in the PSA-Fiat case that the structuring of their alliance allows the two partners to increase their inter-dependency and, consequently, to reinforce the deal.

The PSA-Fiat alliance on MPV vehicles is not the sole significant link between the two groups. Since 1978, they have been associated in the production of light trucks. These vehicles are produced in Italy (about 190 000 units per year) by Sevel Sud, a company that is equally controlled by the two groups. They are commercialised by Peugeot, Citroën and Fiat, under the names Boxer, Jumper, Ducato, respectively. The three models are very slightly differentiated, as far as external appearance is considered, but they are equipped with engines of their own. Yet, the alliance is profitable for the two partners as it allows them to reap benefits from scale effects (exactly as in the case of MPVs).

"The PSA-Fiat alliance was not designed to allow the partners to learn from each other"

What is important to emphasise, however, is that the development, operation and management of the Sevel Sud plant are under the responsibility of Fiat since the creation of the factory. PSA exerts control on the board and through a small number of managers that represent the group on the industrial site in Italy. But, as PSA is not involved in the day-to-day management of the plant, it relies totally on Fiat for those aspects. This organisation obviously created an imbalance as PSA was heavily dependent on the actions of Fiat.

The agreement on MPVs allowed the two companies to solve this problem by finding a new equilibrium for the balance of power between them, by sharing the power on two fields and not just on one. The point is illustrated by Figure 6. They created a new company, Sevel Nord, with equal ownership, which is in charge of the production of MPVs. This company and its plant are located in France. As previously mentioned, its implementation and its management have been delegated to people originating from the PSA group.

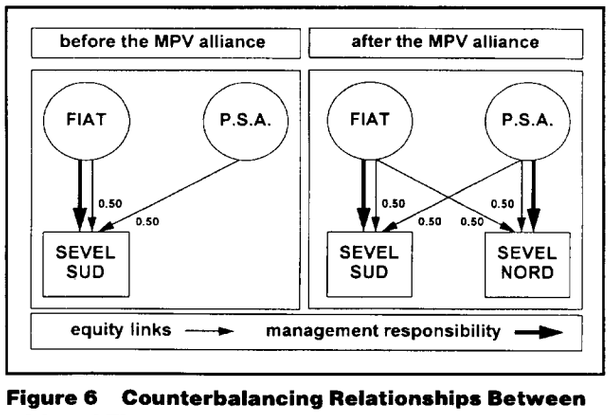

Figure 6 Counterbalancing Relationships Between PSA and Fiat

These new links create an interesting situation. The two partners are involved in two different ventures. Important decisions are taken jointly but they delegate management responsibility to the local partner for each of these ventures. By the way, this form of organisation creates a mutual dependence. The fact that PSA has to rely entirely on Fiat for its supply of light trucks is counterbalanced by the fact that Fiat has to rely entirely on PSA for its supply of MPVs. It can be easily understood that neither partner has any room to behave opportunistically as it may suffer reprisals from its counterpart.

Yet, a serious limit of this organisational form is that dedicating the management of the alliance to one partner notably prevents the partners from learning from each other.

Few Learning Opportunities

Resource transfer alliances, where allies aim to learn from their partners, have been especially examined by Kogut (1988), Hamel *et al.* (1989), Hamel (1991) and Richter and Vettel (1995). In a resource transfer alliance, the partners use the day-to-day exchanges inside the alliance structure between, for example, engineers, human resource managers and marketing people of the allied companies to acquire tacit (i.e. non formal) knowledge.

A well-known case is Nummi, the equity joint-venture between General Motors (GM) and Toyota (see Appendix). The objective of GM and Toyota, through their equity joint venture Nummi, has been to use the structure as a means of reciprocal learning. At the beginning of the 1980s, US car manufacturers suffered from major problems (Womack *er al.*, 1990). Compared to their Japanese counterparts, US plants were far less productive; they obviously needed to fill the gap quickly to survive. To reach this objective, GM decided to reopen its California plant at Fremont (closed a few years earlier due to poor ratings) and to entrust Toyota with the responsibility of its management. If it has been an opportunity for GM to see and learn about Japanese practices, it was also, on the other side, an opportunity for Toyota to learn about the North American car manufacturing environment — that helped it to further open two new factories of its own (Rehder, 1988).

The PSA-Fiat alliance was not designed to allow the partners to learn from each other. Very few opportunities of learning from the partner exist in the alliance. Even though decision-making is shared among the allies for all major issues — especially the definition of the project, Fiat entrusted PSA with most of its implementation: it means that design studies, development and testing of the new vehicle, set-up and management of the new plant are (or have been) under the responsibility of PSA. Only a small number of people from the two companies worked together. Fiat representatives have been part of

the joint task forces during the design process and a limited number of managers are still involved in running production. As a consequence, Fiat benefits from the experience of PSA, but does not learn from its counterpart. As competence exchanges are low, the risk of knowledge leaking is slight. But that means also that the co-operation is not fully exploited.

One explanation of this feature is that gaps between most of the European car manufacturers are not as deep as those that existed between Japanese and North American car manufacturers at the beginning of the 1980s. If learning alliances have been appropriate in the North American context and have been relevant for a European company like Rover (within its former agreement with Honda), they seem less relevant between European car manufacturers.

Nevertheless, for the first time, PSA and Fiat will be able to compare the efficiency of their respective commercial networks as they offer extremely similar cars. However, it is probably more a coincidence than an conscious strategy.

Conclusion

Despite a late entry into the MPV market, PSA and Fiat are now serious players in this field. Sevel Nord has reached production of 450 MPVs (and utility clones) per day. The four brands together ranked first in the 1995 European market. But, there are also now no fewer than five different competitive plants dedicated to the production of MPVs in Europe. And unfortunately, it seems that those production capacities have increased at a higher rate than demand itself.

This article shows the power of scale alliances in a niche market. The two groups have been able to reach results together that they probably would not have been able to reach alone. A classical difficulty associated with alliance management, i.e. opportunistic behaviour, has found a good solution here. Nevertheless, the weak differentiation between the products of the alliance remains a difficulty to be resolved. The probability of price wars is still high.

Appendix — Nummi: From Ashes to Success

New United Motors Manufacturing Co., Inc. (Nummi) has probably been the most publicised joint venture created between Detroit's Big Three and Japanese auto makers. This alliance of the largest US automobile manufacturer and the largest in Japan offers an example of organisations trying to learn from each other (see Figure 7). The two corporations established the venture in an attempt to apply Japanese-style management to automobile manufacturing in the US.

The Nummi plant is a former General Motors (GM) assembly plant; it was previously owned and managed by GM. Opened in 1962 as a state-of-the-art facility in Fremont (California), the plant produced Chevrolet Malibu and Century and GMC trucks along traditional Taylorist lines. Over the years, the plant met serious troubles. In the context of a US automobile industry crisis, employment went from 6,800 in 1978 to 3,000 in 1982. The organisation was tied into adversarial and unproductive labour relationships, hampered by endless conflicts, with us-them divisions between workers and management. As a result, this plant exhibited the worst figures in the GM group. Adler (1993) reports: 'GM-Fremont had low productivity, abysmal quality, drug and alcohol abuse and absenteeism over 20%'. The plant was finally closed in March 1982.

The intention of Toyota and GM to collaborate was announced in February 1983. General Motors provided the facility and Toyota contributed $100 million in capital. The two partners agreed to share tasks: Toyota would take on car design,

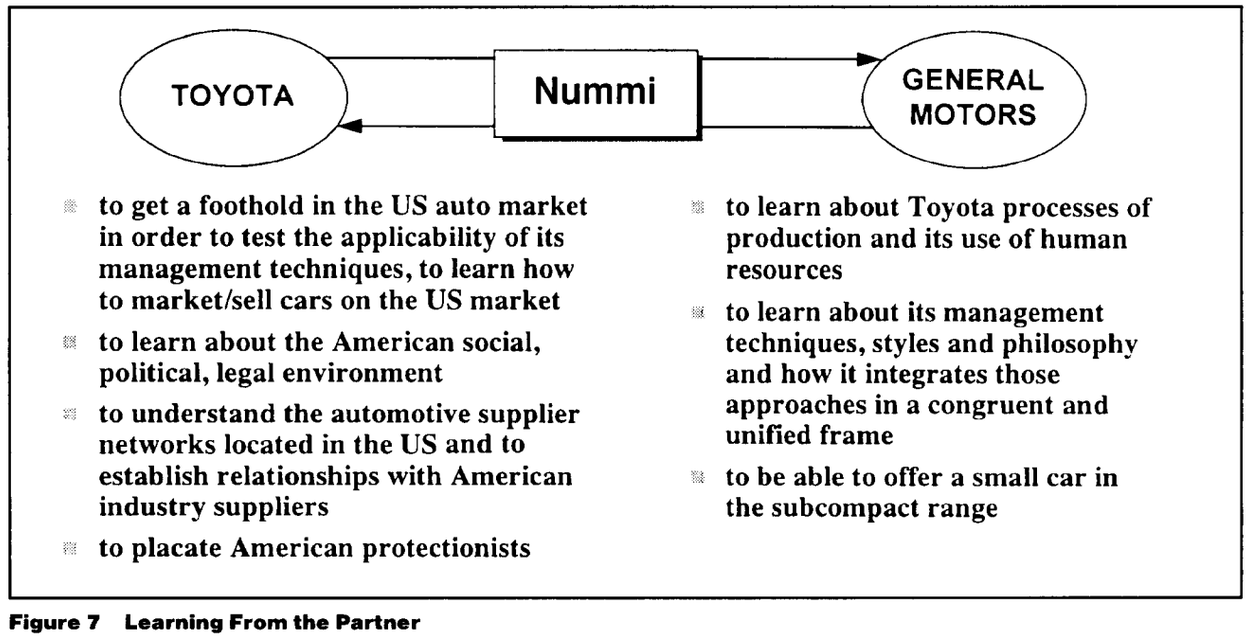

Figure 7 Learning From the Partner

engineering, and daily operations and GM would be responsible for marketing and sales.

Nummi started with an entirely new management team with a different managerial philosophy. Toyota assumed dominance in the joint venture and took full responsibility for teaching the Americans how to implement and manage its production system: Tatsuro Toyoda, the son of Toyota's founder, was appointed as the CEO; he came with a group of about 30 Toyota managers and production co-ordinators. He also recruited managers from Ford, Chrysler and other GM plants (about 20 managers came from GM).

The two building blocks of the Toyota approach to production and operations management are the team concept and standardisation of work. In the lean production model adopted by the firm, learning is based on specialised work tasks supplemented by job rotation and discipline in the implementation of detailed work procedures. This approach is opposite to Volvo's Uddevalla plant in Sweden that exemplified the human-centred alternative arguing that organisational adaptability and learning are best served by longer work cycles and a return to craft work forms.

Managerial techniques cover human resources management flat hierarchies, compression, *empowerment* of people, team problem solving, consensus seeking, and production line organisation (constant improvement [*Kaizen*], continuous-flow manufacturing ['just in time' delivery of automotive parts and components]).

After a two-year closure, Toyota re-configured the assembly plant and constructed an adjacent stamping plant. In December 1984, a new organisation designed around the Toyota production system started. From May 1984 to December 1986, Nummi hired 2,200 workers, jointly re-hired by Toyota and the United Auto Workers (UAW) through a careful job-application screening process (85 per cent came from the previous laid-off work-force — including the entire union hierarchy). In return, UAW agreed to accept the Toyota production system and to simplify the job classification (from 18 skill classes to 2).

In 1993, Toyota and GM announced that they reached an agreement to continue their Japanese/American joint venture in its current form indefinitely. As Nummi was celebrating its 10th anniversary, it achieved another major milestone when it produced its two-millionth vehicle (a 1994 Toyota Corolla sedan) on August 12, 1994.

Nummi exhibits significantly higher productivity, quality and profitability compared to the old GM-Fremont plant. It produces the same number of cars, but with much higher quality and half the work-force. Nummi has earned recognition as a world-class manufacturing enterprise: the quality of Nummi products rivals that of its sister plant in Takaoda City in Japan or even the best Japanese cars (Womack *et al.*, 1990). Even though Nummi has often been a model of labour-management co-operation and harmony, the plant is nevertheless not free from dispute (e.g. the plant almost went on strike in November 1994). Nummi's turnaround stems from the creation of a third culture that was neither American nor Japanese. According to Wilms *et al.* (1994), the hybrid, by combining the best of both parents, enabled the two companies to break away from the old conflict-ridden culture and start anew.

Lessons learned at Fremont allowed Toyota to set up, four years later, two new auto production plants, one in the United States (Georgetown, Kentucky) and one in Canada. Those plants achieve quality levels close to their Japanese-manufactured counterparts. Quoting the Federal Trade Commission, Wilms *et al.* (1994) indicate that Nummi was helping GM to reap the benefits of gaining first-hand experience with an efficient production system. Nevertheless, whether GM actually has integrated the capability of manufacturing small cars is questioned today.

Notes

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3 Such as the Pontiac Trans Sport and Chevrolet Lumina (GM), Ford Windstar, Mercury Villager (Ford) and Nissan Quest, Mazda M.P.V., Toyota Previa, etc.

4 With a cumulative volume of production exceeding 5 millions units, a production close to 585 000 in 1994, Chrysler is the world's largest manufacturer of mini-vans.

5 A small part of the production (about 10 per cent) is assembled by Alpine, a subsidiary of Renault.

6 Matra-Automobiles produces about 300 MPVs per day whereas Fiat produces about 1 600 Tipos per day.

7 Alfa-Romeo, another brand of the Fiat Group, has been excluded from the project because of its strong sports character — not suited to MPV.

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