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Chapter 11

EXAMINATION OF DEDICATED RELATIONSHIPS BETWEEN AUTOMOTIVE SUPPLIERS AND CARMAKERS: EVIDENCE ON THE FLAGSHIP / 5 PARTNERS MODEL

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Abstract

The Flagship / 5 Partners model argues that key suppliers are dedicated exclusively to flagship firms and that flagship firms work on an exclusive basis with key suppliers. As the F/5P model is partly rooted in empirical analyses of the North-American automotive industry, it is interesting to test its external validity on the European car industry. Similarly, it seems relevant to test its claim of exclusive buyer-supplier relationships as there are also scholars that report on non-exclusive b2b practices. This paper analyzes the component supply relationships for 32 car models to test the exclusivity presumptions of the F/5P model. Results show that industry-wide client bases on behalf of suppliers and multiple sourcing practices by carmakers are a stronger empirical reality than exclusive flagship firm-key supplier relationships. Outcomes also indicate that previously in-house parts of carmakers successfully succeed in establishing client relationships with third party OEMs.

Key words: buyer-supplier relationships, single sourcing, automotive industry, flagship firms.

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Introduction

With the studying of and attempts to learn from the Japanese (car) manufacturers (Cusumano, 1985; Dore, 1987; Womack, Jones and Roos, 1990), it not only became fashionable for Western companies to follow the logistics and lean enterprise principals of the Japanese companies (Monden, 1981a, 1981b, 1992), but also to take the supplier relationship management practices of the Japanese as a benchmark for own functioning (Asanuma, 1988; Cusumano and Takeishi, 1991). In that respect, the conclusion was drawn that -among others-carmakers from North America and Europe would have to reduce the enormous amounts of direct supply relationships they maintained with parts and component manufacturers (Boston Consulting Group, 1993; Shimokawa, 1999; Veloso, 2000). In operational terms, what was believed necessary to update the antiquate Western car manufacturer-supplier relationships was to come to a tiering of all supply relationships (with only the first tier suppliers maintaining a direct relationship with the car manufacturer) and to adopt single sourcing policies with regard to the delivery of automotive components for the assembly of car models, instead of having multiple suppliers for the same component.

It is the concept of single sourcing that forms the main issue of inquiry in the present article, and the question to what extent it is implemented. It is not difficult to imagine cases where, for a specific component, a single sourcing policy is practiced with regard to a single car model or even an individual assembly plant. For instance: a specific manufacturer of seats being the sole provider of seats for a particular model or a particular assembly plant. However, one could also hypothesize going beyond that level, more in the spirit of textbook lessons on Japanese inter-firm relationships. This is what the so-called “Flagship / 5 Partner model” (Rugman, 1999; Rugman and D’Cruz, 2000) does. It presumes that multinational corporations, such as carmakers, entertain single and exclusive relationships with key suppliers for their entire global operations. Moreover, the Flagship / 5 Partners model (Rugman, 1999; Rugman and D’Cruz, 2000) claims that key suppliers are dedicated exclusively to flagship firms (see e.g. 2000, p. 11, 36-37, 65, 84-86, 96).

Conceptual support for single sourcing practices can be derived also from other frameworks, like transaction cost economics (e.g. Williamson, 1981). Also in the Network and Interaction Approach to b2b relationships there is a strong emphasis on mutual orientation between firms in buyer-supplier interactions/relationships (Cunningham, 1980; Ford, 1980, 1997), which lead to bonding, relationship-specific investments, adaptations from both sides and lasting relationships (Johanson and Mattsson, 1987; Forsgren, Hägg, Håkansson, Johanson and Mattsson, 1995; Laage-Hellman, 1997). However, these two approaches do neither exclude the simultaneous existence of multiple buyer relationships on behalf of a specific supplier, nor of multiple supplier relationships on behalf of a specific buyer. The Flagship / 5 Partners model, though, seems to be provide a stronger argument for single sourcing. Therefore, attention is focused on this model's premises when analyzing the concept and practice of single sourcing.

As the conceiving of the Flagship / 5 Partners model (hereafter: F/5P model) is partly rooted in empirical analyses of the North-American automotive industry, it is an interesting challenge to see to which extent such exclusive relationships can be observed in automotive business reality. Especially since there are also scholars like Lieberman and Montgomery (1988) and Wells and Rawlinson (1994), who refer to the existence of industry-wide suppliers. Moreover, a fair share of the historical anecdotal evidence[1] that exists, as well as particular theoretical reasoning (see e.g. works in the Transaction Cost Economics tradition from Williamson, 1975, 1981, 1985 and works in the tradition of the Resource-Based View from Wernerfelt, 1984 and Barney, 1991), would question such exclusivity behaviour for being too risky for both sides. Among others as it would lead to high asset specificity of resources or pronounced relationship-specific investments (Dyer, 1997) with the risk of low value of such resources in other circumstances than under incumbent relationships (Klein, Crawford and Alchian, 1978). Also, engaging in exclusive relationships presupposes a level of trust between business partners that may not be realistic in the Western world (Sako, 1992; Dyer, 1997). Instead, there may be too much fear for opportunism on behalf of the other side to prevent the emergence of exclusive relationships in many occasions (Williamson, 1985).

Given these antitheses, this article tests the exclusivity presumptions of the F/5P model via a survey on buyer-supplier relationships in the automotive sector. It investigates to which extent single sourcing policies and exclusive buyer-supplier relationships are in play in the car industry beyond the level of individual car models or assembly plants.

Based on a sample of 32 European car models, the buyer-supplier relationships for a specific set of automotive components are analyzed. The survey allows to screen the validity of the exclusivity claim regarding buyer-supplier relationships and to assess the existence of industry-wide suppliers. It also enables to comment upon the client trajectories that several component manufacturers have "travelled" since gaining independence from their former owners i.e. Delphi from GM, Visteon from Ford and Faurecia from PSA.

Results show that industry-wide client bases on behalf of suppliers and multiple sourcing relationships on behalf of carmakers are a stronger empirical reality than exclusive flagship firm-key supplier relationships. Outcomes also indicate that previously in-house parts of carmakers that became independent have succeeded in establishing client relationships with multiple third party carmakers.

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[1] For instance, Lopez de Arriortua's approach to saving GM several billions of dollars in the early 1990s made sure that no supplier would be interested in an exclusive relationship with GM. And the other US carmakers had only slightly better reputations, since they also started asking across-the-board price reductions from their suppliers.

The Flagship / 5 Partners Model

The F/5P model (Rugman and D’Cruz, 2000) can be seen as a conceptual framework for understanding the formation and evolution of business networks. Their creators claim that the model is inspired by successful *keiretsus* (p. 8, 33, 57, 86, 180).

The term "flagship firm” refers to a company operating at the core of an extensive business network. Usually the flagship has long-term relational contracts with a set of five partners. The five partners consist of the flagship firm itself, key suppliers, key customers, competitors, and non-business infrastructure. The present article focuses on the relationships between the flagship firm and the key suppliers. From Rugman and D’Cruz (2000, pp. 36-37, 86, p. 94 and notably pp. 166-170) it can be understood that the difference between key and non-key suppliers in an automotive industry setting, is the difference between first tier and lower tier suppliers. They argue that the first tier suppliers provide a key input to the network whereas the other suppliers do not.

The F/5P model is based on the assumption that sustainable competitiveness can best be achieved through co-operative relationships in a business network structure. It argues that inter-organizational cooperation makes firms depend less on internalization as the sole means to leverage their firm-specific advantages and gain competitive advantage. Instead of depending on internalization, the F/5P model posits that a flagship firm focuses on sharing knowledge among partners in order to facilitate inter-organizational learning.

Rugman and D’Cruz (2000) compare their F/5P model with Lorenzoni and Baden-Fuller’s strategic network framework (1993, 1995). Lorenzoni and Baden-Fuller speak of a central firm instead of a flagship firm. Like Rugman and D’Cruz, they also stress asymmetrical dependence between the central firm and the partners.

The F/5P model argues that the behaviour of key suppliers can be explained through their asymmetrical dependence on the flagship firm’s strategy and their exclusive dedication to a certain flagship from a single industry perspective (Rugman and D’Cruz, 2000; Rugman and Verbeke, 2003). This implies that the flagship firm is able to provide a strategic perspective for all five partners pertaining to their networks and that each true partner does not need a fully separate strategy except to be a "key" partner of a specific flagship firm.

In the F/5P model, the actors involved are supposed to share a common global strategy and purpose, with the flagship firm having the resources and perspective to lead the network and strategically manage its activities. The partners yield the strategic leadership to the flagship because it is the flagship’s product and global strategy that made the partners join the network in the first place. Key suppliers are expected to give near or total exclusivity to the flagship firm (Rugman and D’Cruz, 2000, p. 2, 9, 31, 41, 65, 84-86, 96). The supposed benefit to suppliers of such a deal is that they should receive increased order volumes and multi-year supply contracts, strategic and technological guidance and learning, and capture a higher proportion of value-added activities that are outsourced by the flagship firm (p. 58). The reason for flagship firms to work on an exclusive basis with key suppliers is to harness their own global strategy. Global competition in industries is supposed to take place increasingly between F/5P-like business networks and there is a trend for multinationals as flagship firms to depend less on internalization (Rugman and D’Cruz, 2000, p. 57; Rugman and Verbeke, 2003). Consequently, sharing knowledge among network partners in a collaborative atmosphere facilitates interorganizational learning and fosters competitive advantage of both a hub multinational and the partners with which it works.

To conclude with, Rugman and D'Cruz (2000, p. 56) state that "… partners may compete in business systems not related to that of the business network, [and therefore] it should be emphasized that the flagship firm's asymmetric strategic control extends only to those aspects of its partners' business systems committed to the network." This would mean that a versatile component company active in e.g. the automotive industry and the defence industry, could at the same time be a key supplier to one flagship firm from the automotive business and to another from the defence industry. However, it also implies that a specific supplier of key inputs to a certain flagship firm of a business network does not operate as key supplier to another flagship firm operating in the same business system, like the automobile industry.

Empirical Observations

The rationales behind the F/5P exclusivity propositions are in line with general trends among carmakers to reduce the amount of suppliers from which they source (Lamming, 1993; Womack, Jones and Roos, 1990; Sako and Warburton, 1999; Veloso, 2000) and to form long term relationships with key suppliers (Pyke and Johnson, 2003; Maurer, Dietz and Lang, 2004). In this respect, the following figures are very illustrative. Between 1984 and 2001 Renault reduced the amount of suppliers of automotive parts from which it sourced from 1800 to 507 (Gorgeu and Mathieu, 1995; Renault, 1986-2002RA; Renault, 1991-2002AE). From 1983 to 2001, VW reduced its worldwide supplier sample from 30,000 to 4,532 (Volkswagen, 1984, p. 37; Grohn, 2002). Identical trends can be observed for other carmakers, like PSA: from 900 direct suppliers in 1986 to approximately 500 in the year 2000, BMW: from 1400 to 600 in the same period, Ford: from 2400 to 1200 in the same period, and Chrysler: from 3000 to 600 in the same period (the Economist Intelligence Unit, various years; Ward's, various years). Furthermore, Chrysler's average contract length nearly doubled over a ten-year period (Helper, 1991; Dyer, 1997). Finally, after playing with the thought of following a "single firm per module supply across the world" strategy (Veloso, 2000), Ford now plans to cut by more than half the amount of suppliers from whom it buys the 20 parts that make up about half of its global purchasing bill. Meanwhile, it will offer larger, long term contracts on models built from 2008 onwards to the ones that will remain as preferred suppliers and build more collaborative relationships via a so-called "Aligned Business Framework" (Automotive News, 2006).

It is also in line with tendencies towards global instead of local-for-local sourcing (see for example the annual reports on behalf of automotive OEMs, as well as: Boston Consulting Group, 1993; Shimokawa, 1999) and single and module-based sourcing in detriment of multiple and fragmented sourcing (see again the annual reports of automotive OEMs, as well as: Lamming, 1993; Dyer, Sung Cho and Chu, 1998). It can also be underpinned by empirical observations that indicate that many overseas supplier establishments follow from corporate negotiations with carmakers for whom they already work and to which they want to keep committed (Volpato, 1997; Carillo and Gonzalez Lopez, 1999; Shimokawa, 1999; Gonzalez Lopez, 2000; Frigant and Lung, 2002).

At the same time, however, one can find indices of opposite practices. Empirical evidence demonstrates that carmakers encourage suppliers to work for multiple clients (Florence, 1996), and suppliers may effectively follow a multiple client strategy or an industry-wide car constructor servicing policy (O hUallachain and Wasserman, 1999; Rutherford, 2000, p. 743; Rhys, 2000; Valeo, 2000). Similarly, conceptual thinking from the network and interaction approach to b2b relationships emphasizes multiple inter-firm ties (Håkansson and Shehota, 1989; Laage-Hellman, 1997, p. 16). Finally, recent times also witnessed a selective return of carmakers to multiple sourcing for one and the same component in order to spread risks and not to place all eggs in one basket. See e.g. front-end production and assembly activities for the Renault Clio (Renault, Marzo 2001G, p. 42) as an exponent of a more general practice of working with multiple suppliers per component (Torrico, 2002). Also Veloso (2000) argues that VW and Renault tend to relate with more than one partner for the development and supply of a specific component. All these observations are at odds with the exclusivity principles, preached by the F/5P model.

Table 1. Synthetic overview of the benefits and costs of single sourcing

Advantages of single sourcing	Possibility to reduce costs through exploitation of scale economies (Marshall, 1890; Penrose, 1959; Chandler, 1962) Simplification of parts procurement and quality control activities and dealing with a more surveyable supplier base with, consequently, lower transaction, agency and quality inspection costs (Williamson, 1975, 1981, 1985; Jensen and Meckling, 1976; Fama and Jensen, 1983) Better possibilities to build trust relationships with a reduced number of suppliers (Sako, 1992)
Disadvantages of single sourcing	High (resource) dependence upon a sole supplier (Barney, 1991; Wernerfelt, 1984), in terms of product flow (e.g. in case of strikes, fire or calamities) and quality of products sourced High switching costs, especially in case of high asset specificity (Williamson, 1975, 1981, 1985) Information asymmetry: supplier tends to understand better the technical processes behind product and production, and has a better view on cost savings possibilities. This results in weaker bargaining power on behalf of the buyer and can lead to opportunism on behalf of suppliers (Williamson, 1975; Kapoor and Gupta, 1997; Ford et al, 1998) Single sourcing provides lesser opportunities for learning effects, to increase absorptive capacity and to identify best practices (Cyert and March, 1963; Levitt and March, 1988; Cohen and Levinthal, 1990) Single sourcing may provide insufficient incentives to suppliers to offer the best possible price, quality, service and overall performance, due to a lack of competition with peers (Ettorre, 1995; Carter and Narasimhan, 1996) If demand is high, it may supersede the available production capacity of a single supplier and multiple sourcing provides a better way to deal with demand uncertainty (Williamson, 1975; Ford et al, 1998)

Source: own elaboration.

On the part of suppliers, it is neither self-evident that they would follow a single client model as there is ample proof of the existence of industry-wide suppliers (Lieberman and Montgomery, 1988; Wells and Rawlinson, 1994). Besides spreading risks and enlarging turnover and learning possibilities, lack of trust is another source that feeds multiple client strategies.

Conssequently, there is a trade-off between the benefits of exclusive and non-dedicated buyer-supplier relationships. In the table below, we summarize and conceptualize the main (dis)advantages of single sourcing, notably from the buyer's perspective.

Consequently, the F/5P principles of buyer-supplier exclusivity are far from undisputed and the degree with which it can be encountered in practice deserves a closer look.

Research Design

The chosen research setting to explore the tenability of the F/5P assumption that key suppliers are exclusively dedicated to a flagship firm and that flagship firms engage in exclusive relationships with key suppliers, is the European automotive industry.

This choice is invoked by the following motives. First of all as the automotive industry is a prominent example of a sector where one encounters buyer-supplier networks on a large scale (Castells, 1996; Dyer, 1996; Fine and Whitney, 1996). Secondly as the conceivers of the F/5P model also apply their concepts on the North-American car industry and source from practices in the car industry of that part of the world, it also follows that the car industry is a good test case for assessing the validity of the ground rationales underneath the F/5P theory. Thirdly, with regard to the automotive industry, the phenomenon of single sourcing is related to the exclusivity point raised by the F/5P model. In fact, whereas the practicing of single sourcing is widely reported on single plant and or model level, the F/5P model goes one step furhter and predicts single sourcing and dedicated supply on a corporate level (that is: a buyer company sourcing a specific component from one supplier for its whole product range or a supplier selling a specific component exclusively to a single buyer company). Thus, also from this perspective the automotive industry makes sense as a relevant and interesting research setting. Finally, the fact that the present research focuses on flagship firm-key supplier practices in the European automotive industry means it may also allow drawing up comparisons between North-American and European flagship firm-key supplier practices.

Within the automotive industry setting, the carmakers can be seen as the flagship firms, whereas key suppliers are notably the first tier suppliers.

The carmakers are the companies that assemble and integrate the various components and systems obtained from suppliers into a final product for the end consumers market. They are the hub or central buyer firm of the automotive buyer-supplier networks.

By key or first tier suppliers the F/5P model refers to those suppliers whose components and systems are a vital input to the final product and which already form an integrated product or module in itself ("system integration"), see e.g. Rugman and D'Cruz, 2000, pp. 36-37, 86, p. 94 and notably pp. 166-170). As a consequence, the article focuses on examples like complete cockpit systems instead of identifying who are possibly the suppliers of clockwork instruments, rubber panels and panel support items behind the system integrator of the cockpit as a whole.

The data used to deal with our research question were gathered via a medium-sized survey on the first tier suppliers that OEMs work with for several car models. In total, with regard to 32 car models assembled in Great Britain and on the European continent, coming from 5 car groups, the first tier supplier relationships for a specific set of automotive components were analyzed. All car models are from the smaller and middle class segment. Moreover, most car models stemming from the same car groups are platform interrelated. This contributes to basing the analyses upon an internally coherent set of research units.

Data came from own field work with regard to the suppliers for the VW Polo and the Renault Clio, supplemented by breakdowns of the supplier networks around car models obtained via specialized automotive journals. Finally, data were obtained from annual reports from several first tier suppliers to final assembly plants throughout Europe.

The car models that were screened are presented in the following tables. To highlight the interrelatedness of models and brands, they are grouped platform-wise as well as based on shared group ownership.

With regard to this research sample, the following analyses were carried out.

One, with regard to the following components it was investigated whether a single car concern used one or more suppliers for the car models screened, both across platforms and on the level of a single platform:[2]

- Exhaust system
- Suspension
- Steering direction
- Coil springs
- Front-end carrier
- Wing mirrors
- Fuel system
- Cockpit
- Seats
- Head lamps

Two, for each of the identified first tier suppliers active in the delivery of the aforementioned components, it was established whether it maintained supply relationships with one or more carmakers.

Finally, the research looks into the penetration of former in-house suppliers or internal "departments" of certain carmakers i.e. Visteon (ex-Ford), Delphi (ex-GM) and Faurecia (PSA-linked) into the supply chains of previously unrelated carmakers for these suppliers.

Volkswagen	**Audi**	**SEAT**	**Skoda**
Volkswagen Aktien Gesellschaft			
"Supermini" Platform PQ 25: VW Polo SEAT Cordoba	Platform PQ 35: VW Golf VW Touran Audi A3 Skoda Octavia SEAT Altea	Platform PL 45: Audi A6	"Super Passat" Platform PL 62: Audi A8 VW Phaeton

Peugeot		**Citroën**	
PSA			
Platform PF1: Citroën C2 Citroën C3 Peugeot 1007	Platform PF2: Citroën C4 Peugeot 307	Platform PF3: Peugeot 407	Platform PF4: Peugeot 807

Figure 1. Continued on next page.

[2] The components whose suppliers' we have examined form a representative sample of automotive parts that are commonly outsourced by car manufacturers today. Moreover, only those components were withheld for analysis for which the subsequent suppliers of most of the screened 32 car models could be traced back. In other words, we focused on those components for which most supplier identity indicators were available.

Renault	Dacia	Nissan
Renault-Nissan Alliance		
Platform B : Dacia Logan Renault Modus Renault Clio Nissan Micra	Platform C : Renault Scenic	Platform M2: Renault Espace

Opel / Vauxhall		Saab
General Motors		
Platform Gamma: Opel / Vauxhall Meriva	Platform GM 2700 / 3000: Opel/Vauxhall Astra	Platform EPSILON: Opel/Vauxhall Signum Saab 9-3

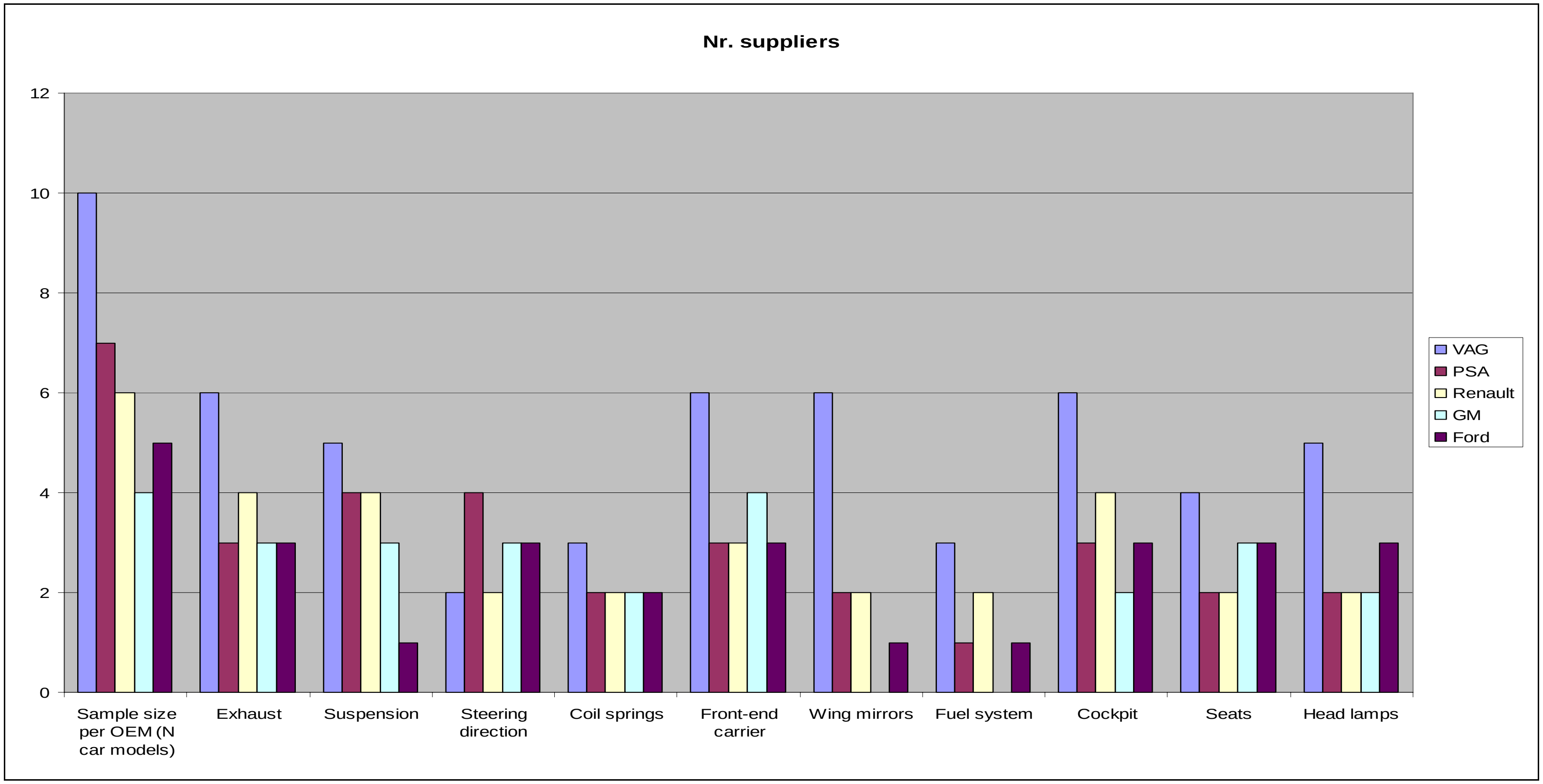
Ford	Volvo	Jaguar
Ford Motor Company		
Platform B 2: Ford Fusion	Platform BE 91: Ford Streetka	Platform C 170: Ford Focus Ford Focus C-Max Volvo S40

Source: own elaboration.

Figure 1. Overview and classification of research sample.

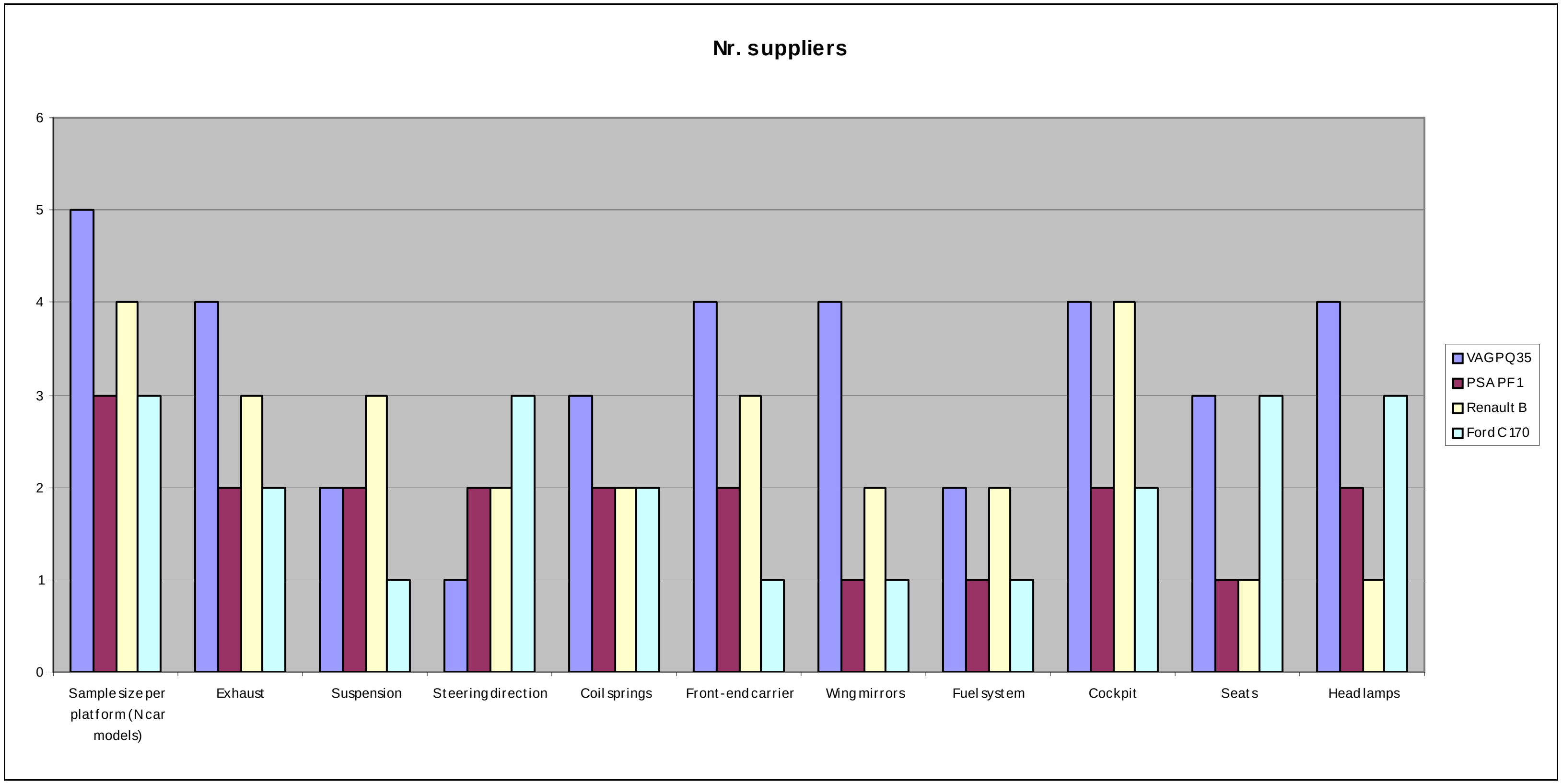
Results

In the next figures and tables the following issues are illustrated. Figure 2 presents the number of component-specific suppliers per car constructor as a whole. This serves as an indicator for car constructor practices of single sourcing per component and of maintaining exclusive supply relationships with regard to individual components. Figure 3 reports the number of suppliers an OEM engages for specific components on the level of platform-related car models. This serves as an additional indicator for the existence of single sourcing practices. Figure 4 shows, per component type, the number of clients to which component-specific suppliers service. This serves as an oligo-/monopolization indicator per component "segment" and as an indicator for the existence of industry-wide suppliers c.q. of dedicated supply practices per component "segment". Table 1 presents the amount of components that formerly in-house departments of specific car constructor sell to the carmakers that formed our sample. This serves as an indicator for the penetration of such formerly internalized supply activities into third party client relations and the degree with which formerly in-house suppliers of OEMs have succeeded in establishing business relationships with competitor OEMs.



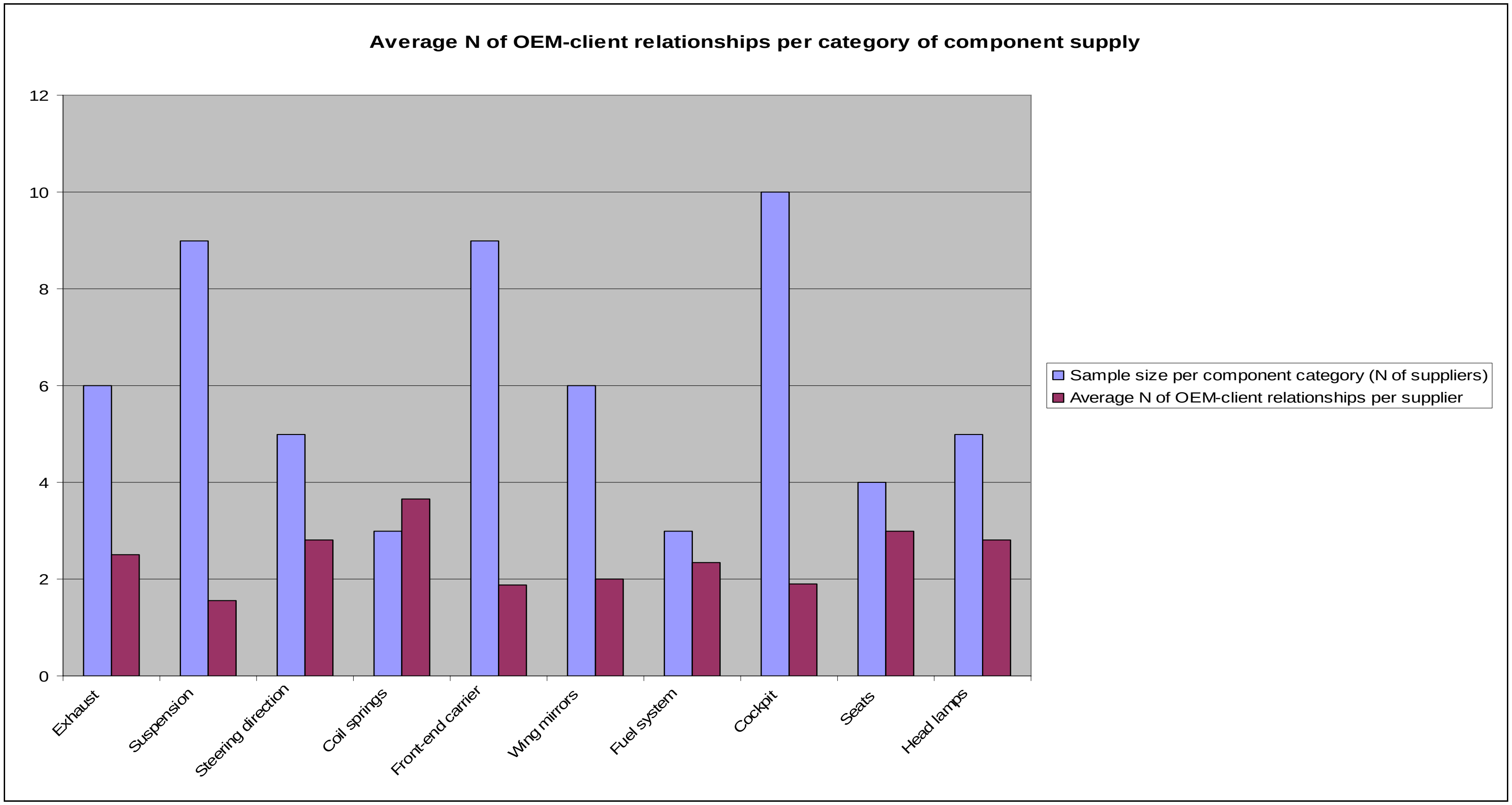
Source: own elaboration.

Figure 2. Number of component-specific suppliers per car constructor (results as measured on a corporate level).



Source: own elaboration.

Figure 3. Number of component-specific suppliers per car constructor (results as measured on platform level).



Source: own elaboration.

Figure 4. Number of carmakers to whom suppliers deliver specific components.

Table 2. Number of supplied components to sample of OEMs by (formerly) in-house departments of specific carmakers

Clients	Visteon (ex-Ford): interior and exterior trim parts, lighting, climate systems, powertrain systems, steering systems, chassis components, cooling systems	Delphi (ex-GM): engine management systems, climate control, cockpit and interior products, cabling, cooling systems, steering systems	Faurecia (PSA-linked): exhaust systems, seats, acoustic package, cockpit, door panels, front-end module
VW	1	4	6
Ford	5	1	4
GM	1	4	3
PSA	5	2	6
Renault	2	1	6

Source: own elaboration.

From the previous graphics the following can be learned. According to the F/5P thesis that flagship firms practice single sourcing for the supply of key components, values for “number of component-specific suppliers per car constructor” (see Figures 2 and 3) should generally be “1”. However, as one can see the empirical results provide a rather different picture. On a corporate level, only Ford demonstrates signs of single sourcing per component for a whole range of car models. I.e. for the five car models screened of Ford, it appears that regarding suspensions, wing mirrors and fuel systems it makes use of the same supplier. On the level of platform-related car models, one encounters somewhat more indications of exclusive supply relationships for specific components. All reviewed platforms appear to have one component-specific single supplier case. For VAG’s PQ 35 platform this is the case with the steering direction: for all five car models pertaining to the indicated platform that were screened, the steering direction was delivered by the same supplier. PSA’s PF 1 platform, 3 car models screened, appears to work on a single supply basis with a particular supplier for wing mirrors, fuel systems and seats. Renault’s B platform, 4 car models screened, appears to work on an exclusive basis with a single supplier for the supply of seats and head lamps. Finally, Ford’s C 170 platform, 3 car models screened, revealed single sourcing signs for the supply of suspensions, front-end carriers, wing mirrors and cockpits.

On a whole, however, there is a strong case to assume that OEMs engage with multiple suppliers for all kinds of key inputs to their final products. On a corporate level, for the conjoint of car constructor-component combinations only in 2,5% of the possible cases indications of single sourcing are encountered. On the level of platform-related car models, this is 25%. The latter percentage indicates that single sourcing is not even the general rule for component supply on platform-level. The fact that our research sample has a reduced size, makes one even think that if it were larger, this would become even more manifest. The same is probably true for the findings on a corporate level. Therefore, notwithstanding the fact that single sourcing practices are certainly a reality for individual car models, on more aggregated levels of analysis, i.e. on platform-level and on corporate level, the phenomenon exists to a lot lesser degree. In fact, multiple sourcing appears to be the standard. This becomes most manifest in the case of VAG, although it has to be stated this was the company for which most car models were screened (which may inflate the impression that VAG exceeds the other OEMs in multiple sourcing). All in all, the overall picture is one of multiplicity of

OEM-supplier relationships per component. Not even on platform-level, except for a minority of components, OEMs seem to engage in single supplier relationships.

As regards insights on suppliers working exclusively for specific OEMs, we turn to Figure 4. there the average number of clients serviced by suppliers of specific components are portrayed. If a supplier of a specific component were to service only one OEM, he would get a value “1”. As our sample contains but 4 OEMs, the maximum value for OEM relationships a supplier can entertain is “4”. The closer to 1 the average amount of OEM relationships entertained by a set of component-specific suppliers is, the more this indicates exclusive supply relationships. If the average score is closer to 4, the more this indicates the existence of industry-wide suppliers. Overall, the average scores lie well above the value 1. Only for the components with a rather fragmented supplier landscape, i.e. with large numbers of suppliers, like suspensions, front-end carriers and cockpits, the average number of OEMs serviced per individual supplier is rather low (below 2). On the other hand, for components where one encounters a more concentrated supplier landscape, as for coil springs, fuel systems and seats, one encounters significantly higher values. To a certain extent, the latter is logical as the more oligopolized or monopolized a component segments is, the more clients the few (remaining) suppliers from this segment will service. For one reason, as their clients will not have a lot of choice. The opposite is not automatically true, if a component segment counts with a large number of suppliers, this does not have to mean that each of them will only service a small number of the final clients sample. For this depends on the sourcing strategies of the buyer OEMs. If they insist on multiple supplier relationships for specific components, then also in the event of a fragmented supplier landscape each individual supplier can still entertain multiple supplier relationships. This is illustrated by the fact that also in the cockpit, suspension and front-end carrier segments one encounters many examples of suppliers that service various OEMs and exclusive relationships are also here far from being the rule. Thus, also in these segments this leads to average values well above 1. And although we do not measure extremely high values (close to 4) for the components segments with large numbers of suppliers, still the results in Figure 3 point at a general situation of non-dedicatedness on behalf of suppliers vis-à-vis OEMs and ample evidence of industry-wide suppliers. It also fortifies the impression of OEMs practicing multiple sourcing strategies.

A final finding that follows from our sample material, is that formerly dedicated suppliers have succeeded in establishing multiple OEM client bases. From Table 1 it clearly appears that both Visteon, Delphi and Faurecia –all three of them offering a highly diversified package of components and functions- have effectively penetrated into the purchasing channels of several OEMs that are competitors of their (former) owning hierarchies. This is most strongly the case for Faurecia. With regard to this company it was possible to establish that it supplies multiple functions and components to all five OEMs from our sample. This is what our own primary data indicates. Moreover, secondary analysis on the annual reports of these three companies reveals that they also supply several other OEMs, often with the same kind of (key) components. Therefore, they also can be classified as industry-wide suppliers.

Discussion and Implications

Results show that industry-wide suppliers are a stronger empirical reality than exclusive buyer-supplier relationships. More than single sourcing practices per component on behalf of carmakers, one observes sourcing from multiple supply relationships. In fact, several of the analyzed carmakers publicly express that this is a policy they follow, also on the level of individual car models. Noteworthy examples here are VW and Renault. For example with the introduction of the latest Golf, Volkswagen continued its policy of splitting parts contracts among multiple suppliers (Automotive News Europe, September 22, 2003, p. 22T) using two or more suppliers on several key components. Whereas having multiple suppliers per component for a single car model may not be that typical, based on our sample it can be concluded that -when looking at the level of platform-related models or on a corporate level- it is clearly mainstream that multiple component-specific supplier relationships are maintained. And this sourcing behaviour appears to be representative for all carmakers that were screened.

The practice of sourcing specific components from multiple suppliers is understandable. It forms a way to regulate lock-in effects and dependence upon external relationships (Grabher, 1993; Uzzi, 1997; Kamp, 2005). Likewise, it fosters learning possibilities for carmakers. By engaging in multiple supply relationships, carmakers learn from different parties (Lane and Lubatkin, 1998; Nooteboom, 2002) and as such they are better able to judge the functioning of suppliers. Moreover, this can limit the know-how differential and, therefore, dependence on behalf of carmakers upon suppliers that can arise from outsourcing.

The fact that several carmakers maintain certain component development and manufacturing activities in-house can also be interpreted as a way to dispose of countervailing power to dependence on external suppliers. For instance, Renault maintains certain production and development activities in-house and VW has created joint ventures with third parties for the conceiving and production of several key components.

While multiple sourcing points at carmakers' attempt to not depend entirely and exclusively on a single supply relation, the maintenance of in-house component capacity may indicate that carmakers intent to not rely completely on outside companies at all. As such, this is also a sign that carmakers sense that they (can) loose too much control over the forth bringing of vital car components.

Another observation that results from our survey is that not all carmakers engage to the same extent in sourcing of “mega-modules” or of contracting suppliers for far-reaching “system integration”. This may also be based on the desire to avoid a too strong reliance on suppliers. In concreto by keeping the integration of automotive conjoints below a certain (system or modular) level, carmakers avoid losing too much grip on their conceptual and technological development and on their composition in parts and technologies. Through less aggregated conjoints, the purchasing management is able to maintain a stronger hold on the overall design and cost of a conjoint and exercise more control over supplier relationships. It also avoids becoming too dependent on suppliers through co-location patterns related to modular production. In fact, whenever OEMs have adopted a modular strategy at assembly plants (e.g. VW Resende, MCC Hambach, Skoda Mlada Boleslav, SEAT Martorell, Volkswagen Pamplona, Ford Valencia), it has strengthened spatial clustering and agglomeration of suppliers around such plants (Frigant and Lung, 2002), adding to mutual dependence between buyers and suppliers through higher site-related asset specificity 5williamson, 1981). The former has led several scholars to argue that this increases suppliers' bargaining power (Millington, Millington and Cowburn, 1998; Van Hoek and Weken, 1998).

Furthermore, also because it is posited that “… few suppliers really know all the technologies involved in more complex modules such as cockpits or front-ends. As a result [several] suppliers are unable to manage all the sub-systems and having them integrate them does not always offer benefits” (SupplierBusiness, 2003, p. 20), carmakers may be more interested in less integrated modules. It also offers an additional explanation for a purchasing policy that does not rely on single supplier relationships for complex and vital components.

On the other hand, there are multi-faceted supplier companies like Visteon, Delphi, Siemens and Bosch that dispose of knowledge and capabilities that many carmakers do not possess anymore (Grohn, 2002) and with regard to whom the rise of a know-how differential is a real possibility. This adds to the point that certainly not all suppliers depend asymmetrically on their car constructor clients. At least, the ongoing specialization of (certain) suppliers in their respective fields means that asymmetry in buyer-supplier relationships can be contained and that buyers can even come to depend on their suppliers. Moreover, as several of those suppliers service multiple buyers (even in multiple industries), their dependence on single carmakers should not be overestimated.

Consequently, the non-distinction of the F/5P model into different “leagues” of suppliers as regards dependence and possibilities to influence car constructor firm strategies becomes problematic. As a matter of fact, it seems more appropriate to argue that some suppliers can be termed “influential suppliers” (Lamming, 1993; Grohn, 2002), whereas others –in spite of being first tier suppliers- have a rather weak impact on the strategies of car manufacturing firms. In brief, one can indeed expect that high-technology component suppliers like Bosch, Siemens and even commodity suppliers like Alusuisse exert significant influence on the strategies of car manufacturing firms and are less depending on (single) carmakers. However, one should expect suppliers responsible for the delivery of, for instance, mirrors, to do so to a far lesser degree.

Precisely from the viewpoint of reducing dependence, also the establishment that suppliers do not devote themselves to a single client relationship is comprehensible. Not only from a direct commercial perspective, but also from a market and business intelligence point of view: relating to multiple clients is rational. While attending one single client, suppliers can lose valuable feedback about their market environment. Working for different clients enhances suppliers’ learning curve, which influences their competitiveness in a positive way. This is something from which also carmakers can take profit. Hence, carmakers are also interested in their suppliers servicing multiple carmakers, as is testified by Pries (1999).

Therefore, a managerial implication of our findings for purchasers is to be critical towards single sourcing practices. Instead, engaging with multiple suppliers will help to spread risks and increase learning opportunities. Concerted competition between and development of supplier capabilities helps improve performance and rentability for all parties involved. For sellers, the main implication is to be critical towards preferred vendor statuses. They ought to engage also with multiple buyers in order to spread their risks and steepen their learning curve.

The previous considerations question the rationality behind the exclusivity claims of the F/5P model as such. Similarly, our findings lead to the conclusion that the assumption of the F/5P model regarding exclusive buyer-supplier relationships in a flagship-key suppliers setting are not valid in the European automotive context.

Consequently, how then should the present results be judged in view of the observation that the conceptual and empirical fundaments underlying the F/5P model are partly rooted in the automotive industry (see e.g. Rugman and D’Cruz, 2000, p. 19, 37), and Rugman and D’Cruz’ assessment that they are applicable to this sector (2000, p. 160)?

One can try to reconcile the different findings by pointing at the fact that OEMs may behave differently from one Triad-leg (e.g. North America or Europe) to another. In fact, Rugman and D'Cruz (2000, pp. 179-180) insinuate this themselves by claiming that automotive flagship firms operate regional business networks and not global ones. In other words, that modus operandi between OEMs and key suppliers can be different from one place to another. This is confirmed by studies on Japanese transplants outside Japan (Rutherford, 2001).

However, there is more reason to believe that the F/5P model is not representative for buyer-supplier relationships in today's automotive industry. Ultimately, it can be hypothesized that the way the F/5P model presents OEM-supplier relationships has never been the standard all together, not even in the North-American automotive industry. In support of this thought one can point at the lack of trust that has characterized buyer-supplier relationships in the U.S. automotive industry even before the arrival of purchasing managers like José Ignacio Lopez de Arriortua (Dyer and Chu, 1997). Only the trend towards trimming supplier bases, also among North-American OEMs, provides reason to believe that the remaining suppliers will entertain relationships of longer term, but by no means it equals exclusivity and mutuality.

In this regard, Liker and Choi (2004) register how today, on the one hand, American OEMs want myriad suppliers for everything (p. 109), and on the other hand, set vendors against each other and then do business with the last supplier standing (p. 110). The fact that our sample also analyzed relationships of American and Canadian carmakers (GM, Ford) and suppliers (e.g. Magna, TRW, Visteon, Delphi), and witnessed that all of them relate with different suppliers or buyers respectively, contributes to the idea that also in North America sourcing from multiple suppliers and supplying to multiple clients is a normal practice. This is also voiced by Dyer, Sung Cho and Chu (1998) who reported that American OEMs adopt a rather laissez faire posture vis-à-vis suppliers that serve multiple carmakers.

A final point is that the F/5P model's conception of OEM-supplier or flagship-supply partner relationships –in terms of mutual exclusivity- may be due to the erroneous parallel that tends to be drawn with *keiretsus* as the basis and legitimization for assuming exclusive buyer-supplier relationships. As Nishiguchi (1993, p. 7) states: "A general misconception or confusion … equates the so-called harmonious Japanese supplier relations with an exclusionary single sourcing policy of automakers (further confused with *keiretsu*)". Other scholars likewise established how single sourcing is in fact less common in Japan than usually thought (Richardson, 1993; Hines, 1995). Moreover, Lincoln, Harland and Brennan (1998) and Rutherford (2001) reported that significant changes were in fact taking place in the supplier relationships in Japan, and the *keiretsu* system is being adapted with primary suppliers being less dedicated solely to one major car assembler. Instead, they are increasingly supplying multiple automotive OEMs. Furthermore, Rutherford (2001) reports on erosion of long term loyalty of assemblers towards suppliers and a turn to price-based competition among suppliers and ditto relationships between automotive buyer and supplier firms. This has especially been the case with Nissan, who warned many of its traditional parts manufacturers that they are on their own now. The shift away from "old school" *keiretsu* principles at Nissan may of course have to do with its financial situation and its marriage with Renault, which may have infused more European principles on supplier relationships. For Toyota does not seem to move away from the traditional *keiretsu* patterns at the same pace. At the same time, many *keiretsu* suppliers intend –after setting up transplants abroad-following its mother hen car assembler, to diversify the client base of their overseas subsidiaries, either by gaining access to other Japanese OEMs abroad or to non-Japanese OEMs (Parker, Rutherford and Koshiba, 2000).

Also Liker and Choi (2004) point at the fact that Western executives incorrectly assume that in the *keiretsu* model companies are locked into buying components from specific suppliers. Instead, they report that neither Toyota nor Honda depends on a single source for anything and both develop two to three suppliers for every component or raw material they buy (p. 109).

As a general point of conclusion then, it can be argued that exclusive buyer-supplier relationships certainly exist, especially on the level of single supply plants or final assembly plants, but it is illogical to assume that it is a general practice for (buyer or supplier) companies as a whole. On the part of suppliers, it is hard to conceive how they would render themselves completely at the mercy of one client. Several reasons to not expect this have been forwarded throughout this article (for example lock-in dangers and dependence on one client). On the part of buyer firms, it would mean that they miss out on suppliers working for multiple carmakers that bring in experiences from elsewhere. This holds true in Japan, Europe and North America.

Outcomes from our sample also indicate that previously in-house parts of carmakers that came to stand on their own feet (Delphi, Visteon and Faurecia) have successfully established client relationships with third party carmakers. Therefore, even organizations that formerly pertained to direct competitors appear able to establish business relationships with additional clients. This also adds up to the impression that exclusive buyer-supplier relationships are not representative for the way carmakers and first tier suppliers relate to each other in automotive business networks.

References

Asanuma, B. (1998), Japanese manufacturer-supplier relationships in international perspective: the automobile case, *Working paper* no. **8**, Faculty of Economics, Kyoto University

Automotive News Europe (2002-2004), Car cutaways

Automotive News (2006), 4 join Ford top supplier list, 19 June 2006

Barney, J.B (1991), Firm resources and sustained competitive advantage, In: *Journal of Management*, **17** (1), pp. 99-120

Boston Consulting Group (1993), The evolving challenge for the European automotive components industry, Brussels

Carillo, J. and S. Gonzalez Lopez (Février 1999), Relaciones cliente-proveedor de empresas automotrices alemanas en Mexico, Actes du GERPISA, *Division internationale du travail et relations constructeurs-fournisseurs*, pp. 65-76

Carter, J. R. and R. Narasimhan (1996), Is purchasing really strategic?, International *Journal of Purchasing and Materials Management*. **30** (13), pp. 3-13

Castells, M. (1996), The rise of the network society, Oxford

Chandler, A.D. (1962), *Strategy and structure: chapters in the history of the industrial enterprise,* MIT Press, Cambridge MA

Cohen, W. and D. Levinthal (1990) Absorptive capacity: A new perspective on learning and innovation, *Administrative Science Quarterly*, **35**, pp. 128-52

Cunningham, M. T. (1980), International Marketing and Purchasing of Industrial Goods:Features of a European Research Project, *European Journal of Marketing,* **14** (5/6), pp. 322-338

Cusumano, M.A. (1985), *The Japanese automobile industry: Technology management at Nissan and Toyota*, Harvard University Press, Cambridge, Mass.

Cusumano, M.A. and A. Takeishi (1991), Supplier relations and management: A survey of Japanese, Japanese-transplant, and US auto plants, *Strategic Management Journal,* **12**, pp. 563-588

Dore, R. (1987), Taking Japan seriously, The Athlone Press, London

Dyer, J.H. (1996), Specialized supplier networks as a source of competitive advantage: evidence from the auto industry, *Strategic Management Journal*, **17**, pp. 271-291

Dyer, J.H. (1997), Effective interfirm collaboration: How firms minimize transaction costs and maximize transaction value, *Strategic Management Journal*, **18**, pp. 535-556

Dyer, Jeffrey H., Sung Cho, D. and W. Chu (1998), Strategic Supplier Segmentation: The Next ‘Best Practice’ in Supply Chain Management, *California Management Review,* **40** (2), pp. 57-77

the Economist Intelligence Unit (several years), Motor business international and components business international, various editions/issues

Ettorre, B. (1995), A strategy session with Prahalad, C.K., Purchasing performance measurement’s influence on concurrent engineering activities customer-supplier relationships: a model of performance in relational exchanges buyer seller relations’ transaction cost, *International Journal of Business and Marketing.*

Fama, E.F. and M.C. Jensen (1983), Agency problems and residual claims, In: *Journal of Law and Economics*, **26** (June), pp. 327-349

FASA-Renault (1966-2002), *Informes Anuales* 1965-2001, Madrid

Fine, Ch. H. and D.E. Whitney (1996), Is the make-buy decision process a core competence?, MIT

Florence, A. (25-26 January 1996), Supply chain interactions and supplier relationships, Paper presented at «Colloquium on Regional strategies for innovation and competitiveness in the automotive industry», Cardiff

Ford, D. (1980), Developments of buyer-supplier relationships in industrial markets, *European journal of marketing*, **14**, pp. 339-353

Ford (Ed.), D. (1997), Understanding business markets, London: Dryden Press

Ford, D.; Gadde, L-E; Håkansson, H.; Lundgren, A.; Snehota, I.; Turnbull, P. and D. Wilson (1998), *Managing Business Relationships*, John Wiley & Sons Ltd., Chichester

Forsgren, M., Hägg, I., Håkansson, H., Johanson, J. and L.G. Mattsson (1995), Firms in Networks: A New Perspective on Competitive Power. *Studia Oeconomiae Negotiorum* #**38**. Uppsala: Acta Universitatis Upsaliensis

Frigant, V. and Y. Lung (December 2002), Geographical proximity and supplying relationships in modular production, *International Journal of Urban and Regional Research*, **26** (4), pp. 742-755

Gilodi (2001): Interview with Mr. A. Gilodi, *Member of Renault’s Corporate Purchasing Management*, 7th of June 2001, Technocentre Renault Guyancourt

Gonzalez Lopez, S. (Avril 2000), Estrategias corporativas y espacios locales: las empresas automotrices en la zona de Toluca, Mexico, *Actes du GERPISA*, **29**, pp. 67-90

Gorgeu, A. and R. Mathieu (1995), Les liens de Renault avec ses fournisseurs: équipementiers et sous-traîtants, *Actes du GERPISA*, Nr. **14**, pp. 41-58

Grabher, G. (1993), *The embedded firm: on the socio-economics of industrial networks*, London

Grohn (2002): Interview with Mr. F. Grohn, *Member of Volkswagen's corporate management for global and forward sourcing*, 21st of March 2002, Wolfsburg

Håkansson, H. and Shehota, I. (1989), No business is an island: The network concept of business strategy, *Scandinavian Journal of Management*, **5** (3), pp. 187-200

Hines, P. (1995), Purchasing for lean production: the new strategic agenda, International *Journal of Purchasing & Materials Management*, **32**, pp. 2-10

Hoek, R. Van and Weken, H. (1998), How Modular Production can Contribute to Integration in Inbound and Outbound Logistics, *International Journal of Logistics: Research and Applications*, **1** (1), pp. 39-56

Jensen, M. and W. Meckling (1976), Theory of the firm: managerial behavior, agency cost, and capital structure, In: *Journal of financial economics*, **3**, October, pp. 305-360

Johanson, J. and L-G. Mattsson (1987), Inter-organizational relations in industrial systems: a network approach compared with the transaction cost approach, *International studies of management and organization*, **XVII** (1), pp. 34-38

Kamp, B. (October 2005), Formation and evolution of buyer-supplier relationships: Conceiving dynamism in actor composition of business networks, *Industrial Marketing Management*, **34** (7), pp. 658-668

Kapoor, V. and Gupta, A. (1997), Aggressive Sourcing: A Free-Market Approach, *Sloan Management Review*, Fall, pp. 21-31

Klein, B., Crawford, R.G. and A.A. Alchian (1978), Vertical integration, appropriable rents, and the competitive contracting process, *Journal of Law and Economics*, **21**, pp. 297-326

Laage-Hellman, J. (1997), *Business networks in Japan: supplier-customer interaction in product development,* London: Routledge

Lamming, R. (1993), *Beyond partnership: strategies for innovation and lean supply*, London

Lane, P. J., and M. Lubatkin (1998), Relative absorptive capacity and interorganizational learning, *Strategic Management Journal*, **19**, pp. 461–477

Levitt, B. and J.G. March (1988), Organizational learning, In: *Annual review of sociology*, **14**, pp. 319-340

Lieberman, M.B. and D.B. Montgomery (1988), First-mover advantages, *Strategic Management Journal*, **9** (1), pp. 41-58

Liker, J.K. and Th.Y. Choi (December 2004), Building deep supplier relationships, *Harvard Business Review*, **82** (12), pp. 104-112

Lincoln, M, Harland, C. and R. Brennan (1998), Developing supplier relationships. *British Journal of Management*, **8,** pp. 57-71

Lorenzoni, G. and C. Baden-Fuller (1993), *Creating a Strategic Center to Manage a Web of partners*, *Working paper*, June, University of Bath, School of Management, Bath BA2 7AY

Lorenzoni, G. and C. Baden-Fuller (1995), Creating a strategic center to manage a web of partners, *California Management Review*, **37** (3)

Marshall, A. (1890), *Principles of economics: an introductory volume*, London: MacMillan

Maurer, A., Dietz, F. and N. Lang (2004), *Beyond cost reduction: Reinventing the automotive OEM-supplier interface*, the Boston Consulting Group

Millington, A.I., Millington,C.E.S. and Cowburn,M. (1998) “Local assembly units in the motor components industry”, *International Journal of Operations & Production Management*, **18** (2), pp. 180-194

Monden, Y. (January 1981a), What makes the Toyota production system really tick?, *Industrial Engineering*, pp. 36-46

Monden, Y. (September 1981b), How Toyota shortened supply lot production time, waiting time and conveyance time, *Industrial Engineering*, pp. 22-30

Monden, Y. (1992), *Cost management of the new manufacturing age: innovations in the Japanese automotive industry*, Productivity Press, Cambridge, Mass.

Nishiguchi, T. (1993), Governing competitive supplier relations: new auto-industry evidence, *MIT/IMVP Annual sponsors’ briefing meeting*, Cape Cod (Mass.)

Nooteboom, B. (March 2002), A Balanced Theory of Sourcing, Collaboration and Networks, ERIM Report Series Reference No. ERS-2002-24-ORG

O hUallachain, B. and D. Wasserman (1999), Vertical integration in a lean supply chain: Brazilian automobile components parts, Economic Geography, **75** (1), pp. 21-43

Parker, P., Rutherford, T. and T. Koshiba (2000), New directions in Canada’s Japanese owned automobile plants, In: Bowles, P. and L.T. Woods (eds.), *Japan after the economic miracle: in search of new directions*, Kluwer Academic Publishers, Lancaster, UK, pp. 85-103

Penrose, E.T. (1959), The Theory of the Growth of the Firm, New York: John Wiley

Pries, L. (Février1999), The dialectics of automobile assemblers and suppliers restructuring and globalization of the German «big three», Actes du GERPISA, Division internationale du travail et relations constructeurs-fournisseurs, pp. 77-92

Pyke, D.F. and M.E. Johnson (2003), The Practice of Supply Chain Management, Kluwer Academic Publishers, pp. 77–90

Régie Nationale des Usines Renault (1986F-2002F), Financial Report 1985-2001, Paris

Renault (1991AE-2002AE), Atlas économique 1990-2001, Paris

Renault (2001G-2002G), *Global Magazine*, Nrs**. 1-11** (Febrero 2001 – Marzo 2002), Madrid

Renault (1986RA-2002RA), Rapport Annuel 1985-2001, Paris

Rhys, G. (2000), Supplier parks: Economies of scale play a vital role, *Financial Times Survey – Industry briefs*, FT Auto 0200/Outsourcing

Richardson, J. (1993), Parallel sourcing and supplier performance in the Japanese automobile industry, *Strategic Management Journal*, **14**, pp. 339-350

Rugman, A. (1999), *Multinational enterprises and the end of global strategy*, Oxford University working paper, Oxford

Rugman, A. and J. D’Cruz (2000), *Multinationals as flagship firms*, New York

Rugman, A. and A. Verbeke (2003), Multinational enterprises and clusters, *Management International Review*, **43** (3), pp. 151-169

Rutherford, T.D. (2000), Japanese investment and buyer-supplier relations in the Canadian automotive industry, *Regional Studies*, **34** (8), pp. 739-751

Rutherford, T. (2001), Mutual adaptation: Japanese automobile transplants in North America and the restructuring of buyer-supplier relationships, *Environments*, **29** (3), pp. 73-89

Sako, M. (1992), Prices, quality and trust: Inter-firm relations in Britain and Japan, Cambridge

Sako, M. and M. Warburton (1999), *Preliminary report of European research team Modularization and outsourcing project*, MIT/IMVP Annual forum, Boston

Shimokawa, K. (1999), *Reorganization of automobile industry and structural change of the automobile component industry*, MIT/IMVP Publications, Boston

SupplierBusiness (August 2003), Volkswagen changes purchasing strategy, Issue 1

Uzzi, B. (1997), Social structure and competition in interfirm networks: the paradox of embeddedness, *Administrative Science Quarterly*, **42** (1), pp. 35-67

Valeo (2000), Supplier parks: Economies of scale play a vital role, *Financial Times Survey – Industry briefs*, FT Auto 0200/Outsourcing

Veloso, F. (2000), The automotive supply chain organization: Global trends and perspectives, *Working Paper*, MIT, Cambridge, September 8

Volkswagen (1981-2002), Geschäftsbericht 1980-2001, Wolfsburg

Volpato, G. (Février 1997), Fiat Auto and Magnetti Marelli: toward globalization, *Actes du GERPISA*, Nr. **22**, pp. 69-98

Ward’s (several years), Automotive yearbook

Wells, P. and M. Rawlinson (1994), *The new European automobile industry*, New York

Wernerfelt, B. (1984), A resource-based view of the firm, *Strategic Management Journal*, **5** (2), pp. 171-180

Williamson, O.E. (1975), Markets *and hierarchies: Analysis and antitrust implications,* New York

Williamson, O.E. (November 1981), The economics of organization: The transaction cost approach, *American Journal of Sociology*, **87** (3), pp. 548-575

Williamson, O.E. (1985), The economic institutions of capitalism, New York

Womack, J.P., Jones, D.T. and D. Roos (1990), *The machine that changed the world,* New York