

Governance in Automotive Value Chain: Which Configuration between Carmakers and First-Tier Suppliers?

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Abstract: since the introduction of modularity in automotive industry, the sector has undergone several changes. Thus, the production process has become more complex; many companies operating in different fields and dispersed geographically are involved in production network, alongside the raise of powerful mega-suppliers etc. In this context, governance is central. By sitting parameters for other firms, carmakers can ensure their supply of components and avoid any faille. In the light of the characteristics of this industry and using global value chain approach, the purpose of this paper is to analyze how carmakers govern their production network. Through literature review, we conclude that governance between automaker and first tiers suppliers is a dynamic process, evolving over time as well as is a combination of different modes at the same time.

Keywords– automotive industry, Global Value Chain, governance, modularity, power.

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I. Introduction

The value chain notion concerns in particular; inter-firm relationships (Humphrey and Schmitz, 2001), and involves the coordination of non-market economic links, between actors (Gereffi and al., 2005). It refers to the acquisition of value by a product or a service, from the design including the intermediate phases of production until the delivery and consumption of the product (Kalpinsky, 2000). These activities constituting the links of the chain can be separated in time and/or by geography i.e. they can be within the company or outsourced and even beyond the borders of a country. Hence, it defines the notion of the Global Value Chain (GVC) (Gereffi and Fernandez-Stark, 2011).

Indeed, the existence of a governance relationship within the value chain is central. Humphrey and Schmitz (2001, p.3) argue that without this notion, the chain would «*just be a string of market relations*». By means of governance, lead firm controls and coordinates the various activities across the chain.

The automotive industry is particularly concerned by this concept. In the first place, this industry is linked to several other industries. Secondly, the manufacturing process involves several worldwide companies interacting and intervening simultaneously in the various stages of product development. Thirdly, considering the complex nature of the product (vehicle), these companies have to coordinate their actions in order to supply the carmaker with the necessary parts and components.

Also, the introduction of modularity in automotive industry had undergone many changes. One of the central issues related to it; is the reorganization of this industry and the emergence of powerful mega-suppliers. This new context raises interrogations about the way carmakers drive their network and manage their relationships with their suppliers to insure their supplies. So, we ask the following question: what is the configuration of governance in automotive industry?

This article aims to explore the governance structure in automotive industry, by focusing on the production phase. Using a GVC approach, we intend to clarify the nature of links that bind carmakers to first-tier suppliers in their production networks.

The article is structured in three parts. The first one evokes governance in GVC theory and explains the forms it can take and the combinations of criteria that determine each of these forms. The second part focuses on the specificities and organization of the automotive industry. The last and the third part, outline the forms of governance that may exist in this industry through a review of theoretical literature as well as empirical work on governance between car manufacturers and suppliers.

II. Governance in Global Value Chain Approach

In a GVC, lead firms influence directly or indirectly activities and decisions of other firms involved in the manufacturing process of a product or service (Gereffi et al., 2005). According to Humphrey and Schmitz (2001), as part of this governance process, the lead firm sets/imposes parameters to other firms operating in the value chain. These parameters are set as part the required conditions, to accept the supplier's service or product.

More explicitly, according to the authors; the lead firm determines: the specificities of the product to be manufactured, the mode of production (by specifying, for example; the process of its production, the technology used, the skills and the environmental working standards), the location of the production (near the lead firm or in a specific geographical area), the volume of production and in some cases, the lead firm can also set the purchase price beyond which production would not be accepted (Humphrey and Schmitz, 2001).

The form of governance exercised by a lead firm in a value chain is different for each actor (Humphrey and Schmitz, 2001). Gereffi and al. (2005) have highlighted variables which determine these forms of governance. After unveiling the forms of governance that may exist between the buyer (lead firm) and the sellers (suppliers), we shall analyze the variables that regulate the implementation of these forms.

2.1 Forms of governance in GVC

In their article, Gereffi and al. (2005) have defined five governance types within the value chain; which are as follows: market, modular, relational, captive and Hierarchy.

In market based (or armed length) value chains, Companies do not necessarily know each other and the product exchanged is simple and standard. They meet on a market. Interactions and exchanges of information and knowledge between buyers and sellers are not very dense. Market governance is made through the price which is the only criterion of choice taken into account by the lead firm (Gereffi and al., 2005, Sturgeon, 2006).

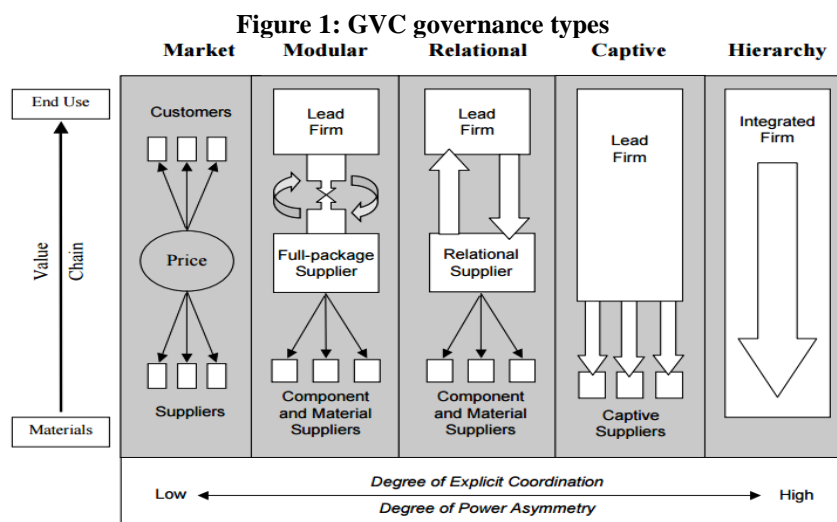
For modular value chains, the supplier manufactures the product according to the specifications given by the buyer. The suppliers have the technological responsibility. The links between the customer and his supplier are closer than in the form of market governance, since the exchange of information on product characteristics is more important. The supplier can also sell the manufactured product to other buyers, which allows the distribution of investment in manufacturing (e.g. research and development) on several customers. This reduces the cost of customer's change as; the supplier uses generic equipments (Sturgeon, 2006).

In form of value chain called relational (or balanced network); the buyer and the seller have closer relations, the information exchanged and the transactions are very dense. Geographical and social proximity including reputation and trust built over time are elements that bring partners together (Gereffi and al., 2005). The lead firm and its suppliers exchange information in order to have a specific product as it is intended for a single customer. The cost of changing partners is very high, which explains the fact that the lead firm tends to restrict this type of link to a limited number of suppliers (Sturgeon, 2006).

When the suppliers depend on the big buyers and act under their directives and controls the value chains in named captive (or quasi-hierarchical). In this form of governance the lead firm sets strict parameters concerning the specificities of the product to be produced. Typically, suppliers are small companies depending on larger buyers. In these chains, the lead firm controls and supervises closely its suppliers in order to avoid any failure (Gereffi et al., 2005). Buyer change's costs are high for these suppliers (Sturgeon, 2006).

Finally, vertically integrated companies, refers to hierarchical chain (e.g. parent company and its subsidiaries) (Gereffi and al., 2005). The chain is controlled by the parent company (Sturgeon, 2006).

In Brief, The following figure (1) summarizes the five types of governance in a GVC.



Source: Gereffi and al. (2005, p. 89)

The governance links in the figure 1 are ranked according to the coordination degree and power asymmetry of the lead firm; the degree of explicit coordination and power asymmetry increases for the lead firm i.e. from the left to the right.

To choose between these five patterns, the “governor” is guided by a number of constraints that push it to define the nature of the link it should have with its partners, to ensure the supply of inputs according to the triptych cost –quality- delivery. It remains to know the criteria that underlie the choice of the lead firm for adequate governance form to its transaction.

2.2 The explanatory variables

Gereffi and al. (2005) identified three main determinants; of the forms of governance between the lead firm and its suppliers. These variables are as follows: the complexity of transaction, the ability to codify transactions and the supplier’s competence.

First, the complexity of transactions concerns exchanges of complex products, which require engineering skills in design and production phases. However, information exchange and knowledge transfer between partners on the specificities of the product and the process can be complex (Gereffi and al., 2005). In this case, interactions between the lead company and its suppliers are denser. The governance forms established are then more elaborate than simple market relationships (Sturgeon, 2006).

Second, the complexity of transactions can be mitigated by the codification of information (Sturgeon, 2006). This is a method used by multinationals to transform information into codified schemas through advanced technology tools. The ability of the supplier, to receive these patterns to decipher them and react allows establishing, a modular chain with the lead firm. In the absence of this competence at the seller’s, the client has the choice between internalizing the task (hierarchical chain), the delegate to another supplier that will be controlled and monitored closely (captive chain), or to deal with a supplier with which it has dense relationships (relational governance) (Sturgeon, 2006).

Third, supplier competences refer to the ability of the supplier to react to instructions received from the customer. Applying what is asked requires the mobilization of technological, managerial and human skills from the company. In order to produce the product corresponding to the quality wanted, with reducing cost and time delivered. In the case when the supplier is able to meet the client’s requirements, modular or relational governance take place. Otherwise, the lead firm prefers to keep the function in-house (hierarchical governance) or to give it to a captive supplier (Sturgeon, 2006).

Table 1: keys governance determinants in GVC

Governance type	Complexity of transactions	Ability to codify transactions	Capabilities in the supply-base	Degree of explicit coordination and power asymmetry
Market	Low	High	High	Low
Modular	High	High	High	
Relational	High	Low	High	
Captive	High	High	Low	
Hierarchy	High	Low	Low	

Source: Gereffi and al. (2005, p. 87)

The table summarizes the key determinants of global value chain governance and ranks governance types in ascending order of coordination degree and power between lead firm and suppliers. This table can be read as follows:

The combination of high capabilities of supplier, low transaction complexity degree and a high information coding can create market governance.

If the three variables are high for supplier; modular governance can raise.

In the case where transactions between a customer and its supplier are complex and the latter is able to react to the instructions of the first, but the coding capacity is low; manufacturers prefer to entrust the function to a supplier with whom they have dense relationship (relational governance).

When the transaction is complex, supplier can decide to codify information. But in the case he incapable to react; carmaker can impose control on the supplier. In other words, captive governance is established between partners.

Finally, hierarchical governance emerges when the ability to codify and respond of the supplier is weak. The lead firm favors the internalization of the function in question.

Ultimately, governance in GVC approach allows understanding and explaining some inter-firm interactions in a network. It provides a reading grid to analyze the way in which the five forms of governance

take place in industries. This can be used in automotive industry for analyzing the relationship between automakers and first-tier suppliers. In the next section we will discuss specificities characterizing this industry.

III. Automotive Value Chain: Characteristics and Organization

The automotive industry mobilizes many actors across the value chain. These companies face multiple structural changes which are technological, economic and institutional order. These transformations push the agents involved to adapt their production systems in this sector (Lung, 2004).

Indeed, by the introduction of modularity, automobile product like sector organization has undergone changes. In this section we will present this notion and the productive organization in automotive industry.

3.1 A complex architecture and a nested geography

Technically, automotive product is qualified as a Complex Product System (CoPS) (Sako, 2003). The complexity of these products comes from the number of integrated components, knowledge and skills intrinsic to their production (Fourcade and Midler, 2004). So, the vehicle is composed of a large number of parts and components, interrelated between them physically as functionally, requiring; technology, knowledge and know-how for its production (Sako, 2003).

In order to reduce this systemic complexity, modularity has been used in these industries (Ulrich, 1995). Schilling (2000, p. 312) defines it as “*a continuum describing the degree to which a system’s components of a system can be separated and recombined*”. In other words, it is about isolating system’s parts to treat them in a relatively autonomous way then to recompose the parts to reach the desired functionality (s) (Frigant, 2004).

To simplify this notion in the automotive industry, the Lego game is used as an example (Frigant, 2007). As an illustration if we take a house built by the Lego game: the house would be the complex product (the vehicle), the bricks would be the components¹ or modules², and the pins and mortises would be the interfaces³ that allow the interlocking parts (Frigant, 2007).

But, for this type of industrial product, the reorganization turns out as a complicated process. Thus, the automobile is imperfectly modular (Frigant, 2007). This imperfection then derives from two characteristics of the vehicle product architecture⁴: functions allocations by components and interfaces characteristics (Ulrich, 1995).

First, most of modules in the automobile are multifunctional; so each module can execute several functions at the same time inside a vehicle (Frigant, 2007). We use the example of the condenser / radiator module for the illustration. In the same area in a vehicle, there is the condenser which has the role of liquefying the air conditioning fluid, the radiator that participates in cooling of the engine and the metal parts which help to keep the car rigid or to absorb energy during an impact etc. Each of these components is distinct and by the combination with other elements, performs certain functionality (Fourcade and Midler, 2004).

Secondly, the interfaces are unstable and change from one model to another. Indeed, in the vehicle; the interfaces are coupled which means that any change in one module will cause a change in the others that are physically linked to it. In this regard, the loss of functionality of the modules requires a reorganization of the overall architecture for each new generation of vehicle. To this extent, module design cannot be done autonomously and requires close collaboration between the various parties involved (Frigant, 2007).

However, these technical specificities weigh on the geographical distribution of the automotive value chain. Thus, they reveal the constraints of interdependencies. The latter appear in coordination mechanisms that limit the spatial dispersion of production activities (Frigant, 2007).

Indeed, according to Frigant (2007) a duality in geographical location appears on the productive level. Moreover, the suppliers combine between two logics; spatial proximity from the carmaker and international dispersion. The choice between these two options is relevant particularly to the nature of the production segment in question. For modules; the closeness is a prerequisite due to their size, bulky mass, fragility and particularly their just-in-time delivery mode. However, the components production is released from the flows coordination constraints if the suppliers manage to make them generic. In this case, supplier’s factories can be located far from carmakers; in areas allowing low-cost production. Nevertheless, since the components delivery is mass and

¹ A component is a physically complex and distinct product, performing a specific task and manufactured from parts assembly (Fourcade and Midler, 2004).

² A module is generally defined by the industrials, as a group of physically close components in the vehicle, which are assembled and tested outside their factories and can be assembled very simply on the car (Sako and Warburton, 1999). This pre-assembled subassembly constitutes an autonomous physical unit, has interfaces and is distinguished by non-mono-functionality (Fourcade and Midler, 2004).

³ The interfaces are physical links predefined by the product architect and which link the modules together inside the vehicle.

⁴ According to Ulrich (1995, p. 420) “*the architecture of the product is the scheme by which the function of the product is allocated to physical components*”.

logistical difficulties hinder the supply of customers, these imply that the spatial dispersion can only be partial by limiting itself to the macro-region (Frigant, 2007).

In summary, automobile represents the case of CoPS; where the modularity remains imperfect. In this mass production industry, production flows requires close coordination and geographical logic combining proximity and dispersion. As Sturgeon and al. (2008) pointed out, the automotive value chain is neither totally global nor linked to a narrow geographical location. Companies forming international network, determine the fragmentation of the value chain; through the division of the production process (Frigant, 2007).

In what follows, we will discuss the organization of the automotive industry and the division of labor between carmakers and suppliers.

3.2 A hierarchical organization

In historical perspective, majority of the production was done by automakers; this trend has been reversing since several years (Lung, 2001). Thus, since the 1980s, the automotive industry is undergoing deep restructuring resulting from vertical disintegration movement of these firms.

This movement emerged mainly after the adoption of the outsourcing and refocusing strategies by the carmakers. They have refocused on their core business, delegating certain segments and functions to other specialized external companies (Baudry, 2005).

The disintegration process was amplified during the late 1990s under the impulse of modular production (MacDuffie, 2013). The adoption of modularity in the automobile has resulted to a number of consequences for car manufacturers, since the early 2000s. Their role is limited to the architect who determines: the general characteristics of the vehicle, defines the physical specifications (size, weight), modules function and interfaces between different components (Frigant, 2004). Modularity has opened the way to qualitative and quantitative rationalization of the carmaker's supply; this change was accompanied by a drastic reduction in the number of suppliers in the panel of automakers (Frigant and Zumpe, 2014).

In this regard, the tightening of the pyramid supply opened the way for restructuring the industry architecture and new actors have appeared in the value chain (Frigant, 2005). These include first-tier suppliers; also known as 0.5 tiers (Lung, 2001), who plays a major role in this chain (Frigant, 2005).

At this level, carmakers are very selective and the concentration of the number of first-tier suppliers was; in line with the choice of equipment manufacturers of international size, capable of assuming greater responsibilities and endowed with higher skills (Frigant and Talbot, 2004). Actually, to integrate this position; these mega-suppliers have to develop their skills at four different levels (Frigant, 2005).

First, since carmakers have disengaged from the detailed subsystem design; they have assigned this task to mega-suppliers (Frigant and Talbot, 2004). The latter have been obliged to increase their expertise level in research and development, to propose, on the basis of carmakers specifications, modules allowing the resolution of architectural and technical problems in the vehicle (Frigant, 2005).

Secondly, considering the complex and multifunctional nature of modules, equipment manufacturers need to broaden their areas of expertise. Indeed, they must master several technologies at the same time. They must associate among others "*the job of plaster to that of electrician, hydraulics to that of electronics etc.*" (Frigant, 2005, p.7).

The third register of competence refers to the ability to propose simultaneously innovative and complete offer. Thus, competitive environment requires that mega-suppliers on one hand anticipate the needs of carmakers and to propose solutions in advance, and on the other hand that they provide services related to the production and development of modules, such as delivery of modules to international carmakers sites (Frigant, 2005).

Finally, there is the ability to control a network. The mega-suppliers have a large network of second-tier suppliers supplying them with the necessary subcomponents for the production of modules.

These features allow mega-suppliers to be a leader in sourcing automakers. However, this does not give them exclusivity. Indeed, SMEs can intervene at the top of the chain and reach the first place (Frigant, and al., 2012). The imperfect nature of modularity in the automotive industry means that the vehicles do not result from a simple assembly of modules provided by mega-suppliers. The car manufacturers express other needs in engineering and component, intended for a special production or prototypes, so they appeal to small companies. This allows them to cover breaches of market neglected by large firms (Frigant and al., 2012).

In all, the increasing outsourcing of firms and the technical modularity of the product had an impact on the structure of the automotive industry. Mainly, new players appeared in the supply chain and a new intra-industry division of labor emerged (Frigant and Julien, 2014). From now on, this industry is organized as a hierarchical network where carmakers are at the top. Nevertheless, the status acquired in recent years by mega-suppliers and the expansion of their skills and roles tend to give them more power.

In the light of these developments, the next section will discuss governance issues in automotive industry.

IV. Configuration of Governance in the Automotive Value Chain

The balance of power between carmakers and mega-suppliers has changed. In context it's questioned that; what power do carmakers hold today? And how do they manage to govern the various activities in their global value chain?

In what follows, we will shed light on this relationship to determine who actually governs the automotive value chain, before moving on to the governance mechanisms applied in this industry.

4.1 Power relationship between carmakers and mega-suppliers: who governs?

As notified earlier by Donovan (1999), the refocusing of manufacturers on their core business could bring benefits, mainly in terms of cost reduction; as it is likely to cause some risks. Thus, the decline of car manufacturers in the value chain encourages the creation of new competitive powers that have their own interests to defend and which diverge from those of carmakers. Indeed, the reshaping of the value chain and the rise of mega-suppliers bring out questions about the balance of power between the main actors in this chain.

In recent years, the issue of power struggles has grown in some industries. The illustrative case being in the computer industry: the computer manufacturer IBM with its microprocessors suppliers and operating systems, Intel and Microsoft. These latter two firms are the product of the modularity and vertical disintegration of computer manufacturers in this industry. History testifies that some of the power has shifted from the assembler to its suppliers who have become leaders in their fields today and capture a significant share of the market (Frigant, 2004). Like what happened in the computer industry, fears are rising to review the "Intel Inside" syndrome reproducing itself in the automotive industry (Lung, 2001).

There are many factors that reinforce the hypothesis that mega-suppliers obtain a status of force that would allow them to reverse the market power in their favor. Some of them are quoted below:

First, some authors point out the cognitive factor. Indeed, modularity would be double-edged since it can push the vehicle manufacturer to what is called "black box modules" whilst they keep a broad knowledge about the functions (Morris, and Donnelly, 2006). This concept signals the loss of total skill assemblers on all the detailed architecture of the modules: the real costs, the time necessary for the development, the level of quality and the technical performance etc., would allow locating mega-suppliers in dominance position (Chanaron, 2001).

For his part, Donovan (1999) puts forwards the financial aspect (profit). He suggests that the dominance of these suppliers would come from the surplus profit generated, and that they could reinvest in technological innovation, marketing etc. In order to have a greater share of the gain, as mentioned, comparatively to carmakers, the author suggests two elements: the fragmentation of the basic supply and the ability to capture consumers. In other words, through the standardization of modules; mega-suppliers could sell the same product to several assemblers and influence the purchase decision of the end consumer. To an extent, that by selling their modules with higher price they would have a financial advantage.

Moreover, according to Frigant (2011), the stabilization of modules will increase competition between mega-suppliers and automakers by drastically lowering the barriers to entry. This is because; the role of the latter is to push their suppliers to innovate more. However, the setting of the internal architecture of the modules; would give mega-suppliers the opportunity to direct their interest towards the acquisition of minimal skills on the overall architecture of the vehicle. Moving on, they could compete with the assemblers on their status as an architect firm (Frigant, 2011).

However, indisputably throughout the evolution of the automotive industry, a single case of OEMs has emerged trying, unsuccessfully, to achieve the status of vehicle assembler. This is the Canadian firm Magna; which made two attempts to acquire carmakers. The first was in 2007, by proposing to buy Chrysler; after Daimler's call of tender issued by Daimler. The second in 2009, by trying to acquire Opel; following its sale by GM, who gave up at the end of the process. This experience demonstrates that the only way in which an auto parts supplier with super performing endowment was on the verge of becoming a carmaker, is the takeover of another established vehicle assembler firm.

More so, no doubt; car manufacturers feeling threatened, they develop their own defense tools. Of course, in order to maintain their market power, they work to circumvent any likely risk through a variety of counter-strategies.

Firstly, to avoid the black box module syndrome (Chanaron, 2001), which limits the ability of assemblers to evaluate the offer made by mega-suppliers, also assemblers can introduce contractual clauses that give them the property right on the module in question (Frigant, 2011).

Secondly, conclusively, according to Frigant (2012), not being able to restrict the innovation of their equipment manufacturers, carmakers are turning to diversify their sources of supply at the end of the "serial life" of each model; in order to avoid any monopolization of position. Additionally, for the same purpose; the vehicle manufacturers deploy a strategy that aims to eliminate the monopoly of innovation, retaining developments only

for certain vehicles or model versions. Another measure, although rarely practiced, relies on making change in equipment manufacturers acting as integrator modules, by switching them from rank 1 to 2 (Frigant, 2012).

Thirdly, with respect to the economic performance of mega-suppliers, research shows that there is a downward trend. Frigant's (2009) statistical analysis of the top twenty Tier 1 equipment manufacturers during the period from 1998 to 2006 show that majority of these suppliers realized low profits and in some cases no profit at all or even negative ones. Indeed, the binding request by manufacturers to lower prices is apparent. According to Frigant (2012), this pressure manifests itself on two occasions between partners: firstly, during the reproduction of a model, wherein cost reduction been paramount and binding as, compared to previous version, secondly, while signing contracts awarding markets (contracts) for several years, wherein the targeted goal is that the profit cover the entire period.

In sum, despite the power acquired by mega-suppliers, automakers still dominate the automotive value chain. This superiority gives them the ability to position themselves as a lead firm and govern their network. It remains that this relationship must be managed through appropriate governance mechanisms that allow carmaker to source in real time, with the designated quality and the right price.

4.2 Governance in automotive industry: dynamic and plurality of forms

In their article on the typology of governance in global value chain, Gereffi and al. (2005) among other things, put forward two important suggestions. Explicitly, the authors point out the dynamic nature of the GVC. Implicitly, the work on the GVC evokes the uniformity of governance in a chain at a given stage of its evolution process.

In what follows, we will examine successively each of these claims, to determine the governance form (s) in the automotive value chain.

4.2.1 Dynamic of governance forms

In general, the mode of governance in industries is evolving over time (Gereffi and al., 2005). This is particularly the case for automotive industry. Two main interrelated explanations can justify this movement: the dynamics of the three explanatory variables of governance (Gereffi and al., 2005) and of power in relations (Humphrey and Schmitz, 2001).

Gereffi and al. (2005) argue that the evolution of the key variables of this model can partially explain the change in the form of governance in a given industry. Firstly, complexity of information can evolve depending on the product demanded by the lead firm. For example, if a carmaker is looking for a sophisticated product, the complexity of the information increases and consequently the capacity of existing suppliers no longer meet the new requirements. Secondly, the capacity of codification can also change by the introduction of an innovation. Any new technology used by the lead firm can induce to a resumption of the process of codification of the requirements. Thirdly, supplier's capacity can also increase through learning, as it can decrease with the entry of new suppliers into the network; the adoption of new technology or the increase of lead firm imperatives.

Beside the variability of these determining variables, power also plays a role in the dynamics of the process. Indeed, as stated by Dicken and al. (2001, p. 105) networks are "*constituted, transformed and reproduced through asymmetrical and evolving powers relations*".

The shape in the form of governance over time in automobile has been supported by some empirical work. For example, Helper (1991), analyzing the change in the relationship between suppliers and carmakers in the United States, showed that coordination has evolved from a market-based mode to more elaborate ones.

4.2.2 Governance forms

The work of Gereffi and al. (2005) evokes the existence of a single predominant type of value chain in a particular industry. This is particularly the case for the automotive industry where some empirical work has taken the same direction. For example, Asanuma (1989), exploring the relationship between vehicle manufacturers and its leading suppliers in the Japanese auto industry, discusses the relational nature of governance.

However, it's to remember that some of automotive industry specificities have been omitted in the majority of this research. These characteristics mean that this industry cannot be governed by a single form, but it can be done by more than one mode of governance at the same time, such as captive and relational (Sturgeon and al., 2008) or even the five types simultaneously and for the same carmaker (Frigant, 2014, Frigant and Zumpe, 2014).

Indeed, specifications of this industry push car manufacturers to take into account certain aspects that affect the mode of coordination of transactions:

First, the vehicle is a CoPS which results on one side from assembling of a multitude of different elements (components, modules etc.), and on the other hand, mobilizes a wide range of different industries. These attributes contribute to technological heterogeneity since each input has a distinct level of sophistication.

Secondly, although the mode of governance is dynamic, as already pointed out, but by comparing the degree of maturity of the components in a specific time; it results that these products are at different stages of the industrial life cycle. Some of the products have reached the age of maturity while others have experienced innovations or have just appeared in this industry (Klepper, 1997).

Thirdly, for their supplies, carmakers interact with mega-suppliers as SMEs (Frigant and al., 2012), and they may buy from local or international market. Therefore, they have to adapt the form of governance according to each case.

Given this variety of heterogeneous cases, manufacturers cannot interact in the same way with all their equipment manufacturers but they must adapt their relations with their partners according to several criteria.

Empirical studies pay particular attention to the plurality of governance forms in the automotive value chain, we mention two of them. Indeed, Schmitt and Van Biesebroeck (2017) in their analysis of how manufacturers interact with their suppliers, and Özatağan (2011); studying the insertion of Turkish component suppliers in Bursa; find the coexistence of the five forms of governance.

V. Conclusion

In this article, by using GVC approach; our objective was to characterize governance relationships between automakers and their first-tier suppliers in automotive industry, especially in the production phase. Three essential points can be highlighted from the discussion:

The first point concerns the actor who governs the automotive value chain. Indeed, this industry is undergoing profound technical and organizational restructuring. The advent of mega-suppliers powers raises fears about the threat of the loss of carmakers positions. However, these latter are still maintaining their position as lead firms that have the ability to govern and drive their network.

The second point concerns the dynamics of governance process. Thus, the governance structure is evolutionary over time as the three criteria determining the mode of coordination change as well as the power relationship between partners.

The third dimension lends itself to the coexistence of a plurality of governance forms in the automotive industry in general and for the same automaker more exactly, and at the same time.

Finally this paper has some shortcomings. Firstly, for explaining governance mechanism in automotive industry, the focus was only on GVC approach and especially on Gereffi and al. (2005) work. Secondly, in their research, governance-which is a wider notion- (Ponte and Sturgeon, 2014) was approached as being coordination. Third, our review, the spotlight was on inter-firms linkages; but other “non-firms” actors like state and nongovernmental organizations etc. are important players in a production network; having power also and participating in governance process (Henderson and al., 2002). In the end, taking into consideration these reflections would be better for the development of a more comprehensive review on the subject.

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