SUPPLIER-CUSTOMER RELATIONSHIPS AND THEORETICAL PERSPECTIVES: NETWORK THEORIES AND PRINCIPAL-AGENT THEORY APPLIED TO THE ANALYSIS OF INDUSTRIAL CONTRACTS AND INTERACTION

Competitive Paper

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Abstract

Purpose of the paper and literature addressed: The purpose of this paper is to identify the nature of the relationships between a specialist supplier to the car industry (HARA) and its customers, most of which are car assembly manufacturers. The theoretical perspectives of network theory, transaction cost theory, principal-agent theory and power dependence theory are applied to this end.

Research method: The paper is structured as a case study informed by theory. The data are primarily collected by using an action research approach in close cooperation with the focal company.

Research findings: The findings indicate that the power relations allow the customers go to great lengths to secure the resources they have invested in the relationship, and to ensure a contract design that will minimize their uncertainty, risk and the likelihood of asymmetrical information and opportunistic behavior. The rewards are result-based, but other contractual measures seek to control and verify the subcontractor's behavior. Social relations were found to exist between the development engineers at HARA and their long-term customer counterparts.

Main contribution: This paper demonstrates the relevance of combining the approaches of transaction cost theory, principal-agent theory, network theory and power dependency theory in order to analytically explore supplier-customer relations. Leaving power theory out of the analysis would clearly limit our insight. Judging by the nature of the relationships in our study – whose character tended to be dominated by the exercise of hierarchical control by the car manufacturers – network theories seem to exaggerate the significance of the social aspects of business relationships. Our type of analysis may thus lead to more realistic practices in supply-chain relationships between companies.

Keywords: Customer-supplier relationships, transaction cost theory, power dependence theory

INTRODUCTION

Between the extremes of market solutions and vertically integrated production, a series of intermediate solutions can be found. These are understood as various forms of networks in which enterprises which are legally speaking independent of each other are nonetheless mutually dependent. This paper analyzes such dependencies with respect to Hydro Aluminium Structures Raufoss (HARA). The purpose is to uncover the nature of the relations involved. Are the relations characterized by equality between the two parties involved, or do we detect unequally distributed power?

In addition to using network theory, transaction cost theory, principal-agent theory and power dependency theory to analyze the empirical material, this chapter includes theory which makes it possible to classify subcontracting into different types.

Many of the value-chains in which HARA is involved also include a third-party operator which takes care of storage, logistics and perhaps also simple assembly prior to high-frequency deliveries of small volumes shipped to the nearby car manufacturers on a call-off basis. The third-party operator is legally speaking an independent firm. However, the choice was made not to include the third-party operator in the analysis, as HARA's production contracts are with the car manufacturers, thus making the third-party operators HARA's suppliers in the value chain. A somewhat special category of supplier is involved here, however, since these players act as connecting links in the flow of materials and logistics between HARA and its customers, which means that transaction costs are generated.

The data were collected from HARA during 2001–2008. I was initially engaged by the company from 2001 in connection with "The Extended Enterprise" (BiN), a research programme jointly financed by the Research Council of Norway, Hydro and other firms, the Norwegian University of Science and Technology (NTNU) and SINTEF. Overlapping the work on this project, during the 2003–2007 period the author was in charge of the project «Innovations in Hydro's value chain of extrusion-based car components», part of the User-driven Innovation Project programme (BIP) and jointly financed by the Research Council of Norway, HARA and the University of Agder. The primary objective of this project was to help boost HARA's market competitiveness in the production and delivery of car components by means of adjustments to the value chain designed to increase the flow of materials, shorten lead times, reduce costs and improve delivery precision.

This work was based on an action research approach (see for instance Reason and Bradbury 2001); however, observations and semi-structured interviews with key personnel supplemented this general strategy. The project agenda was primarily driven by the participants in the various working groups. The logistics manager and «lean» coordinators played a significant role in relation to these groups by coordinating processes and introducing new initiatives into the serial production. I participated and contributed in the actual improvement and change efforts. The empirical data are based upon these experiences, supplemented by semi-structured interviews and observations [1].

The following paragraphs shed light on the theoretical perspectives adopted for this project: network theory, transaction cost theory, power theory and principal agent theory, as well as theory allowing the classification of sub-contracting into different types. These theories are then summarized into focused research questions, before the company relations are analyzed from different angles: those of a network perspective, transactional perspective, principal-agent perspective and power perspective. Finally, a conclusion is proposed.

NETWORK THEORY, TRANSACTION COSTS, POWER, AND PRINCIPAL-AGENT THEORY

In his explication of network theory, Grabher (1993) identifies four basic features that define networks: reciprocity, interdependence, loose ties and power. *Interdependence* stands for the fact that to a greater or lesser extent, both parties depend on the other party, whereas *reciprocity* represents the social dimension of this relationship. Reciprocity includes the degree of trust between the parties. However, reciprocity and interdependence should not be taken to mean harmonious symmetry since relations between firms are also a matter of power. Power can be understood as a necessary ingredient in the successful exploitation of the interdependence between the parties. The criterion of *loose ties* implies that in successful networks the parties adapt to each other only to an extent that does not hamper their flexibility to enter into new relations.

Power is the ability to impose one's will on someone else, or to manipulate someone's will (McNeil 1989). Power is understood as an entity that is tied to dependence. If the supplier is heavily dependent on the customer, this gives the customer a relatively strong position of power; but if the supplier has something the customer wants to gain access to, this will help balance the power relations. Furthermore, power is understood as a phenomenon that is always part of the relationship between firms, whether it can be observed or not. When firms make mutual investments in the relationship (transaction costs), allowing them to pool their resources, the interdependence increases. Large firms often have greater power than small ones within production networks, if they are globally leading and in control of their own research and resources, including brand name, technology and market capability (Yung 2006).

Transaction costs arise when firms trade directly with one another. In cases where a firm

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[1] The paper is reworked from Kalsaas, B.T. (2009). Empirisk studie av kunderelasjonene til Hydro Aluminium Structures Raufoss. In Kalsaas, B.T.,(ed.), *Ledelse av verdikjeder. Strategi, design og konkurranseevne*. Trondheim: Tapir Academic Press

makes unique components for a customer according to contract (subcontracting), the situation changes as soon as the contract has been signed. From this point onwards, the subcontractor no longer has the same incentives to put all the cards on the table – especially if he is the sole supplier[2]. This is the main mechanism behind transaction costs: the parties seek to protect their investments in the relation through different measures, such as coordination, motivation, contracts and monitoring of performance – thus generating transaction costs.

Moreover, the transaction cost theory postulates that human rationality is limited, and that opportunistic behavior may occur. This generates uncertainty in the relationship, further strengthening the need for monitoring, rules, and an emphasis on contracts. External factors may also exacerbate uncertainty, such as when trade is conducted between companies from very different cultures or when complicated value chains are involved, which may in turn further increase transaction costs. In addition, transaction costs are also tied to the frequency of transactions within the same relationship, in the sense that little investment is expected to be made in a one-off transaction, whereas the opposite applies to regularly repeated transactions, such as in cases of subcontracting.

A subcontractor produces parts and components in accordance with specifications from an industrial customer. The relationship is a matter of subcontracting irrespective of whether materials are made available by the customer or not, and irrespective of whether the contract is with an intermediary company or directly with the industrial customer (Friedmann 1977 in Holmes 1986). Chaillou (1977 in Holmes 1986) distinguishes between three groups of manufacturing subcontractors: 1) capacity subcontractors, 2) specialist subcontractors, and 3) subcontractor suppliers. Chaillou makes his assessments along three dimensions when he sorts subcontractors into the three typologies. First, to what extent it is up to the subcontractor or the parent firm to make decisions about the concept, design and specification of the component, organization of the process involved in producing the component, and its manufacturing? In terms of the distribution of decision-making and control, the subcontractor is found somewhere between the two extremes. The second aspect assessed by Chaillou is the degree of market competition. The last factor is whether the component that is subcontracted out is also produced internally. In short, this results in the following differences between the three typologies:

Capacity subcontractor: Here the parent firm is fully in control of decisions about concept, design and specifications, but while the same type of manufacturing also takes place internally, some of the work is contracted out.

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[2] However, this is balanced somewhat by the fact that if the supplier wishes to secure production contracts in the future, he will seek to cultivate the relationship with the customer in the present.

Specialist subcontractors: In this form of subcontracting the subcontractor is responsible for the manufacturing method and the actual manufacturing. Since the components are not at the same time also manufactured by the parent firm, each party's manufacturing is complementary to that of the other.
Subcontractor supplier: In this kind of contract, the subcontractor is to a great extent an independent manufacturer in the sense that he is responsible for the concept, design and specification of the product in addition to its actual manufacturing, but he is willing to enter into a relationship with a parent firm on a subcontracting basis.
These are rough categories, and there are many intermediate positions. The producers of stereo systems, radios and CD-players for the car industry exemplify the category of subcontractor suppliers.
The principal-agent theory is primarily concerned with how the principal (the customer) can design a contract in a way that maximizes the likelihood of the agent (the subcontractor) acting in ways that serve the principal's interests. Here, too, the premise of limited rationality and opportunistic behavior applies. We can tie this perspective directly to the theory of transaction costs, which describes the work to achieve adequate contracts as a transaction cost. The concept of contract should not be understood in purely legal terms, however. It includes everything in the way of rules and measures designed to get things done in the real world when two or more companies trade with each other. The principal can base contracts on two different mechanisms: results or behavior. The behavior-based mechanism is based on tying rewards and payment to factors such as hourly pay, the distance covered, etc., whereas the result-based mechanism refers to the giving of rewards in accordance with the principle of «no cure no pay», and may involve such elements as bonuses and daily fines. The daily fine figures fairly frequently as an incentive in contracts within the building and construction sector. In theoretical terms, behavior-based contracts are informed by the managerial principle of hierarchical control; result-based contracts, on the other hand, tend to rely more heavily on the use of incentives.
The most efficient contract contains the particular mixture of incentives based on behavior and results that will best serve to motivate an agent to act in ways which maintain the principal's interests (Eisenhard 1989; Logan 2000). A contract may consist of a mixture of incentives and measures connected to rewards, punishment, and verification and monitoring of behavior. If a balanced contract is not achieved, this may be due to the parties having asymmetrical information, and to hidden actions that can be ascribed to opportunistic behavior.
The key concepts at the core of the Uppsala school's network theory are resources, activities and actors (Håkansson and Gadde 2001). Resources include factors such as motivated employees, knowledge, technology, brand name and reputation. Activities can be analyzed in terms of equivalence and complementarity, which are central categories for understanding

the division of labor between firms. Activities are equivalent when the same resources and capability can be used to carry them out. Standardization leads to a greater degree of equivalence and creates possibilities for economies of scale. Activities are complementary when they represent different phases of a production process. By combining resources internally or with other companies, companies can create new resources. Resources and capabilities (combinations of resources) provide competitive advantage. Therefore, cooperation with other companies may be very important. The network theory sheds light on the dynamics involved in relationships between companies. A key element is the building of trust through positive and long-term relations and mutual adaptation to routines and systems through processes of mutual exchange. Such processes may be influenced by the personal chemistry between the individuals involved in them. The acting subjects are the actors according to this theory. In order to bring about the combination of resources, someone has to intervene, and thus assume the role of the agent of change.

Specification of the research questions

Based on the theoretical review, the following questions are asked in the empirical analysis:

- Can we identify the main elements from Grapher's network theory in HARA's relationships with its customers?
- What is the significance of social relationships for the business relationship between the different firms?
- What measures do the customers employ to reduce uncertainty and minimize the risk of asymmetrical information and opportunistic behavior?
- What type of contract do the customers use?
- What characterizes the power/dependence relationship between HARA and its customers?
- Is power/dependence a significant factor for understanding the interaction involved in the relationships?

THE PRODUCTION AT HARA

HARA's core product is a safety system consisting of a bumper bar and two crash boxes produced on contract for the car industry, mostly car manufacturers. The basic material is aluminum. HARA consists of three integrated, co-located plants: a foundry, an extrusion plant and a bumper manufacturing plant/forming factory (Kalsaas and Alfnes 2009). With few exceptions, HARA produces components for all the big car manufacturers, adding up to a total of 110 different destinations of delivery and 15 car models (2008/2009). The serial manufacturing phase includes 10 car models and some 70 destinations of delivery. HARA's core competence is knowledge about aluminum alloys (materials technology) and forming of aluminum structures that meet the functional demands of the car manufacturing industry. Development and manufacturing of forming tools is also part of HARA's core competence. HARA is a separate company within the Hydro group, which is globally the third largest integrated supplier of aluminum, with activities on all continents.

A typical subcontract involves five to six years of mass production followed by 15 years of spare parts manufacturing. The mass production period coincides with the life cycle of the car model involved. In addition, each production contract includes a development phase of two to three years before mass production commences. Price turns out to be an important factor during the development work and when production contracts are established.

The network perspective

The car safety systems produced by HARA for its customers are obviously complementary to the customers' own production. Isaksen and Kalsaas (2009) shows that to a great extent, HARA controls the knowledge base of its own technology and is in possession of knowledge that is complementary to that of its customers. The company is also an attractive partner for customers in more open research projects on car safety solutions for the future. Furthermore, HARA can be characterized as a specialist subcontractor, since the company is in charge of the concept, and to a great extent also the design, as well as the manufacturing and the organization of the work processes. However, the customers are in charge of the specifications of strength and adaptation modeling, which have an impact on the design. When customers choose HARA as their supplier, they exemplify the parent company's choice to combine its resources with those of the subcontractor.

During the mass production contract periods there is a considerable mutual dependency between the parties, since HARA is a sole supplier. The customer often owns the tools[3], but moving these to another supplier would involve substantial additional transaction costs, and is therefore an unlikely option.[4] Furthermore, it is an open question whether it would be possible at all for other manufacturers to make use of the tools within a realistic financial framework, as the tools are tailored to specific machines. The phenomenon of reciprocity here means that a production contract has been established after a lengthy and costly phase

[3] There are two alternative ways of covering the costs of tools: 1) The customer buys and owns the tools, or 2) HARA includes the costs of tools in the total costs and writes off its investment distributed across the production volumes planned for the course of the product's lifetime.

[4] A few years ago, another Norwegian company that was a sole supplier for a global car manufacturer was on the brink of bankruptcy. In this case the customer made capital available until other sources of refinancing could be found. This can be interpreted as a step taken by the parent firm to protect their relation-specific investments.

of product development that usually takes 2-3 years of development and prototyping (Isaksen and Kalsaas 2009).
As the contract period progresses, the ties between HARA and its customers are clearly quite loose. However, ties have been identified to exist during the development phase between the HARA engineers engaged in the development work and their counterparts employed by customers with whom HARA has had a longstanding relationship. Such ties do not seem to exist when a product has entered the mass production phase. During this stage, any contact that takes place in the event of problems occurring involves different people. It is found that the relationship between HARA and its customers has the character of a network during the development phase, but that it is more quasi-hierarchical during the mass production phase. The development engineers thus play an important role in maintaining the trust between the parties. Furthermore, examples were found of «bad personal chemistry», articulated as lack of respect, influencing a relation.
The data confirm that the duration of the relationship with the customer is positively linked to the likelihood of securing new contracts. The fact that some of the customers tend to place their orders with HARA provided that HARA can offer a competitive price also indicates that this is the case. Gaining access to a new car manufacturer takes time; see the example of Toyota described later under the principal-agent perspective.

The transaction costs perspective
According to Williamson's transaction costs theory from 1975, since we are dealing with economic activities that require substantial specific investments (transaction costs) the production of bumpers probably ought to be integrated into the car manufacturer's activities. This is due to two reasons, according to Williamson (1975). The first reason is *bounded rationality*, which makes it difficult for the players to obtain an overview of complex chains of variables tied to uncertainty, and may be of relevance in connection with long-term contracts. When such uncertainties are internal to an enterprise, the management structure of the enterprise can deal with them. In the opposite case they are the subject of complicated negotiations. The other reason is *opportunism*. According to this theory the economic stakeholders are likely to have substantial room to pursue their own interests, also through the dishonesty of for instance withholding pieces of information.
However, the manufacturing of bumpers is <u>not</u> vertically integrated into the activities of the car manufacturers. Furthermore, Williamson's transaction costs theory has been countered on the point about market or hierarchy. Williamson also adjusted the theory himself in 1985, admitting that transactions in between the extreme positions of market and hierarchy were more common than he had first assumed. Much of the criticism against the 1975 version of his theory argued that he did not take sufficiently into account the social relationships existing between individuals in different companies (Askildsen and Kalsaas 2009). However, the

market versus hierarchy theory is interesting because what Williamson theorized, was that the purchasing of specialized and complex products from external suppliers would generate too much uncertainty due to bounded rationality and the risk of opportunism. Thus, what we can expect is that customers who have the influence to do so – such as the major car manufacturers – will seek to establish a *contract* to reduce this uncertainty to a minimum while pursuing the advantages associated with outsourcing; cf. the Uppsala school's resource based network theory on the combining of resources. Moreover, the company outsourcing work gains advantages of flexibility related to market fluctuations and distribution of risk.

As indicated, the relationships between HARA and its customers are long-term; they can last for up to 20 years, spanning two to three years of development, five to six years of mass production, and fifteen years of spare parts production. Thus, according to the theory we can expect the customer to seek substantial measures reducing the room for maneuver that allows asymmetrical information and opportunistic behavior, to minimize the uncertainties tied to the transaction. In the data, the following factors can be interpreted as such measures:

- Careful selection of subcontractor
- The development work is based on specifications given by the customer
- Close cooperation between customer and subcontractor on the development of new crash systems
- The organization of HARA's part of the value chain (transport, storage, frequency of delivery) is subject to the customer's approval
- The procedures for quality management of the production are subject to the customer's approval
- The customer demands that the supplier keep a safety stock corresponding to a full week's supply
- The customer demands that EDI communication be set up between the parties
- The customer carries out audits of procedures and quality management during the mass production phase

According to my data, the customer chooses the subcontractor well into the development process, after a phase involving two or three potential candidates. The thorough and extensive selection process must be seen in the context of the single sourcing involved. Furthermore, we must take into account the fact that the process of developing unique components and industrial manufacturing of the component, including the development of tools, represents substantial relation-specific investments for both parties. The increased likelihood of HARA being taken into account as a sub-contractor when an established customer relation with a car manufacturer already exists – as described under the network theory – confirms that choosing a familiar supplier is associated with fewer risks.

The development of crash systems for new car models is based on the functional specifications supplied by the customer (points 2 and 3 above). HARA must document through tests that its product meets the tolerance requirements for new crash systems before mass production can commence. This means that the result of the development process is measurable, as are the mass produced components. The fact that a product is measurable means that the risk of asymmetrical information is reduced, as it allows the customer to perform quality control of deliveries.

During the mass production phase the customers visit the subcontractor with the purpose of conducting systematic audits to ensure that procedures are followed and quality monitoring carried out as agreed. This activity can be interpreted as a measure aimed at reducing the problem of asymmetrical information.

The perspective of principal-agent theory

In all running production contracts, payment depends on call-off of products or on customers' withdrawal of components from consignment stock (self-billing). In other words, the customer pays per unit that satisfies the quality requirements, which means that the reward is result-based. Any other system seems inconceivable in this industry. According to theory, the supplier carries the risk in the system of result-based rewards, but given that HARA is a sole supplier, the customers have problems if for some reason or other this supplier is unable to deliver[5]. In order to further minimize uncertainty and risk, the customers require HARA to keep safety stock equal to a one week of supply. However, the car manufacturers also include in the contract a provision that HARA are liable for damages if their deliveries – or lack of such – cause production stoppages for the customer. This is a hidden but serious threat. The costs of stopping an assembly line in a car factory even for a few hours are enormous. However, HARA has never caused the production to stop in any of its customers' factories to date, but a story from «the old days» describes how bumpers were brought to a customer by helicopter in order to prevent such production stoppage. HARA's development work (the amount of hours used) is calculated into the total costs and is part of the price of the product; depreciation is done through the planned volumes over the lifetime of the product. The same principle is applied to the tool costs, unless the customer has bought the tools. Moreover, several customers have a partnership with a logistics operator that is used to working with the company, and integrated into the customer's computer systems. In many of the cases, this operator is a former logistics department that has been outsourced. In several contracts the customer demands that HARA buy services from the logistics operator it appoints, but practices differ. The logistics operator provides the car manufacturer with

[5] See the previous footnote.

high-frequency deliveries. This value-chain arrangement reduces uncertainty and risk for the customer; cf. the above section on transaction analysis.

The duration of the delivery contracts in our study follow the lifespan of the particular car model. When including the development phase and the spare parts production, this adds up to a considerable amount of time; cf. the above. The long-term aspect of the production contract can be interpreted as a behavioural factor very likely to ensure that the subcontractor will be enjoying fairly stable demand for at least six years – disregarding general crises in the market such as the financial crisis appearing in the autumn of 2008. This reduces the risk for the supplier with regard to fluctuations caused by market competition, and can be seen as a reward for submitting to the customer's hierarchical control during the mass production phase.

There is reason to assume that there is a positive correlation between the duration of the contract period and the degree to which the agent will display behavior that is to the principal's advantage. The contract between the parties includes the expected production volume. However, the realized demand may differ from this figure, depending on the success of the car model in the final market. Thus the subcontractor still carries a certain risk with regard to changes to the demand.

In terms of risk, the picture is more complex and tied to the price of raw materials. Aluminum is rather expensive and constitutes a considerable proportion of value of the finished product delivered to the customers by the subcontractor. The price of aluminum is decided at the London Stock Exchange. The subcontractor seeks to persuade the customer to carry the risk associated with the fluctuating prices of raw materials on the world market. Sometimes the customer accepts this, other times not, and in some contracts both parties take some of the risk. There are also limits to how great a risk the agent is willing to take on. On one occasion the principal, a minor car manufacturer, demanded that the agent deliver on a consignment basis, to be paid only when the car manufacturer had sold the car to a car dealer or final customer. The agent declined this offer.

In the studied relations, the principal can control and verify the agent's behaviour through the:

- measurability of the product and delivery services
- programmability of the product
- well-developed information system

Measurability is ensured through the shared development work; cf. the section above on the transaction cost theory perspective. Delivery services such as the frequency of daily deliveries to the car manufacturer, packaging, and handling of information in relation to releases and deliveries are part of the *contract*. Through specifications imposed on HARA's development work, the product becomes programmable. The mass production phase is supported by EDI-communication of prognoses, call off, releases, shipping, and reception. A vast majority of the customers require EDI-communication. Points 1–3 above are factors that also help reduce uncertainty and risk.

Some of the customers have a tradition of giving out prizes to the suppliers based on performance, such as measured improvement in certain indicators over a given period of time. HARA has received several such prizes, among which is a prize from Toyota. Interpreted in light of principal-agent theory, this can be seen as another behavior-based measure coming from the customer.

Toyota is among HARA's customers, and it was considered a great step in a positive direction when the relationship was established. The data show that becoming a member of the «Toyota family» was a difficult process, but that as soon as HARA was inside, the company was looked after in «every way», in terms of support for the process improvement work and so on. This can be interpreted as an approach taken by the Toyota Company to reduce uncertainty and risk by carefully selecting its subcontractors and taking good care of them later by adopting a supplier development perspective.

Other customers are also engaged in supplier development, even through the overall picture shows that their efforts tend to be rather ad-hoc. For example, a car manufacturer has trained HARA personnel in the Japanese SMED method («Single Minute Exchange of Die»), which seeks to reduce changeover times and increase flexibility with respect to the volumes produced. Again, this is a behavior-based measure employed by the customer.

The power perspective

According to Isaksen and Kalsaas (2009), HARA's knowledge base is to a great extent complementary to that of its customers, and the company enjoys a relatively strong position within its global production network. Nevertheless, at HARA the car manufacturers are perceived as the dominant party in its customer relations. One of the company's managers claimed that: «the customer has all the power». This is an exaggeration that is probably based on experiences from the mass production rather than the development phase. HARA is a sole supplier for its customers, but is faced with stiff competition up until a production contract has finally been secured, way into the development process. The customers have a choice of several suppliers – especially of safety systems made from steel, but within aluminum, too, there are competitors. Seen in a power/dependency perspective HARA is probably more dependent on the customers than vice versa over time, but as a specialist supplier with considerable control over its own knowledge base, and as part of a resourceful industrial group, HARA is a relatively strong player. However, when it comes to the concrete analysis of the relationship with the car manufacturers, HARA's strength cannot easily be identified, except during certain parts of the development phase.

The following aspects of customer relations cannot easily be explained unless they are considered in relation to power:

- The customers demand an open-book policy from the supplier without opening their own books.
- The customers demand annual price cuts.
- The customers demand that the supplier keep a week's worth of safety stock.
- The customers audit the supplier's books.
- The current tendency is that the supplier has to cover an increasing proportion of the costs of developing the product.
- Many customers are reluctant to integrate the supplier's suggested logistics solution into the contract.

The car manufacturers demand an *open book* policy in relation to HARA's costs structure, but the open book only applies to the customer's right to insight into HARA's figures, not vice versa. The objective of open-book systems is to exploit the potential advantages of cooperating with other enterprises (Bjørnenak and Stensland 2009). If the measure is unilateral, open-book regimes can be related to power: The books may have been opened by force. Experiences from Sweden suggest that an open-book policy builds on trust between two parties, and that it is thus connected with something positive. However, in the cases we have studied here, the open-book practice gives the customer insight into HARA's innermost core of data concerning the company's productivity and costs. Such insight would hardly have been granted had the parties experienced each other as equals. Seen from the principal's perspective, the open-book policy is another measure that helps reduce the risk of asymmetrical information. This gives the customer control over the supplier's behaviour since it removes the uncertainty as to whether the components are overpriced.

Furthermore, the customers demand annual price cuts of 2 % as their share of the supplier's anticipated learning curve. For the supplier this is an incentive to approach cost-cutting in a systematic manner – by introducing lean production methods (Kalsaas and Jakobsen 2009). But the fact that demands for such price reductions are successful can be explained by the relative distribution of power between the parties.

It seems to be common practice for customers to conduct audits of their industrial subcontractors' operations. Again, the fact that the subcontractors accept demands for such access suggests that the distribution of power between principal and agent is an important factor in understanding the different mechanisms at work in the process of interaction. Moreover, the data suggest that there is a tendency that the subcontractor has to cover an increasing proportion of the costs involved in the work of developing the product. Or, at least, this is how things are perceived among our informants from the supply side.

The agent/subcontractor we are dealing with here, has sought to include logistics in its contracts with customers in an endeavor to regulate factors such as how close to the shipping date the customer should be allowed to change the delivery plan. Short-notice increases in the volumes to be delivered can generate considerable extra costs for the supplier due to overtime, extra shifts and extra changeovers. Furthermore, the flow is disrupted, with a negative impact on efficiency. The customer, on the other hand, is interested in a maximum degree of flexibility. Data show that when customers need flexibility from the subcontractor, they tend to largely ignore that the logistics agreement is part of the «contract». However, many customers are stable and predictable in their orders and releases.

CONCLUSION

The relationship between HARA and the car manufacturers is characterized by considerable relation-specific investments in the development and manufacturing of new products. This is why there are transaction costs, and when a production contract has been established there is therefore a considerable degree of mutual dependence between the parties, especially since we are dealing with single sourcing. This explains why the customer's process of choosing a subcontractor is such a comprehensive one, and why trying to make it to the shortlist of a car manufacturer is such a demanding task for a subcontractor unless a supplier-customer relationship already exists.

The parties seek to protect their investments in the relationship, and we identify a number of measures implemented by the customer with the purpose of reducing the uncertainty and risk involved in transactions. These measures represent transaction costs.

As expected, the analysis confirms that HARA's production contracts are result-based in that payment is given per produced unit. The customers have supplemented this incentive with behaviour-based measures tied to hierarchical control. Thus, a series of measures have been implemented in order to control and verify HARA's behaviour. An important condition for the contract model in question is that the final result can be measured. The hidden threat at the customer's disposal is the fact that the subcontractor is liable for damages if the customer's production comes to a halt as a result of the subcontractor's behavior.

Using the network theory as a backdrop, it emerges that relationships are also of importance in the car manufacturing industry. The car manufacturers are confirmed to be the dominant party in the studied relations. HARA often manages to secure new production contracts with those car manufacturers the company has a long-standing relationship with, provided that it can offer a competitive price. HARA's development engineers and those of its customers are the significant tradition bearers in this pattern of interaction, in which trust is a key factor.

This is what is described as *reciprocity* in Grabher's network theory. The strong mutual dependence emerging when the production contract takes effect is described above. The factor of loose ties is obviously present, as the car manufacturers are free to choose new relations each time they introduce a new model – and do so if the price suggests that they should, given that the competitors offer equal quality. From the customer's point of view, it is probably desirable to reduce dependence by having additional subcontractors for crash systems besides HARA, although no more than one subcontractor per model. Even though we can identify reciprocity and social relations in the transactions, it is the power aspects that stand out, and the indications that the production network is based primarily on hierarchical control.

The analysis shows that HARA possesses considerable resources, such as competence that is complementary to that of its customers, control over its own competence, and the fact that it is part of a resourceful multinational corporation. However, it is the customers that have most of the power in the business relationship, according to our empirical material. A somewhat alternative interpretation might be to see this as the company having to submit to the customer's hierarchical control in order to be allowed entry into the game at all. A series of aspects of the contract – that is, contract understood as in the principal-agent theory – have been identified as difficult to make sense of unless power and influence are brought into the analysis. These are aspects designed to reduce the customer's uncertainty and risk, such as the likelihood of asymmetrical information, or of the subcontractor engaging in opportunistic behavior. The clearest indicators of uneven power distribution and use of force by the strongest party are the demands that there be an annual price-cut and that the customer must have full access to the subcontractor's bookkeeping (open book).

The network theory of the Uppsala school is valuable for understanding some of the dynamics involved in relations between companies, particularly in an early phase of production contracts during which it can be observed that resources are combined into networks and value chains. However, when it comes to analyzing established relationships, such as in this study, Grabher's contribution to network theory seems more useful, especially since it includes the concept of power. Nonetheless, in the studied relations, the network theory's emphasis on the significance of social relationships seems exaggerated.

The transaction cost theory and the principal-agent theory are somewhat overlapping with respect to measures designed to reduce the danger of asymmetrical information and opportunistic behavior. In the current work, the transaction cost theory is used to analyze the measures implemented by the customer to reduce costs and uncertainty in the transactions. The principal-agent theory is used to analyze the contract type, including the mixture of result-based rewards and behavioral measures, although some of the analyzed measures are found in both of these theories, but seen from a slightly different angle. The transaction approach helps explain the contractual elements of the principal-agent analysis, and in this respect they complement each other.

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