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Document Version

Publisher's PDF, also known as Version of record

Publication date:

1999

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Meer-Kooistra, J. V. D., & Vosselman, E. G. J. (1999). *Management control of interfirm transactional relationships: the case of industrial renovation and maintenance*. s.n.

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MANAGEMENT CONTROL OF INTERFIRM TRANSACTIONAL RELATIONSHIPS: THE CASE OF INDUSTRIAL RENOVATION AND MAINTENANCE¹

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SOM-thema A Primary processes

Abstract: This paper is focused on the way in which interfirm relations can be drawn up and controlled. Drawing on contracting theories a model is built of the management control structure of interfirm relationships. The model consists of three control patterns and of contingency factors that influence the choices between the patterns. Particular attention is paid to the role of trust. In building our model we take the perspective of the outsourcer. We try to refine our model by conducting case research in the field of industrial renovation and industrial maintenance. In this field we observed changes in the way outsourcing relationships are controlled. Case research can be very helpful for gaining insights into factors that influence the establishment of control structures of interfirm relationships. By comparing the results of our case research we found institutional, strategic, cultural and historical factors to be of great importance for these control structures.

Key words: interfirm relationships, management control, contingency factors, transaction cost economics, network approach, trust, case research.

The boundaries of firms are continuously subject to changes. Firms add new activities, hive off existing activities and set up new forms of cooperation with other firms. The concentration on core activities is a tendency that already started several years ago. Non-core activities are hived off, so that the firm can concentrate on the activities which it can perform well and which can thus produce the highest added value. Insight into which activities belong to the non-core activities is subject to changes too. We observe that conglomerates with a great variety of products hive off complete product lines, but we also find that firms, although they do not change their product mix, leave

¹ The authors would like to acknowledge the comments provided by Robert W. Scapens, Anthony G. Hopwood and two anonymous AOS reviewers.

the production of components to other firms. We can also observe that firms outsource the provision of supporting services even more. Even services which are essential for the continuity of the firm, such as administration, information technology and maintenance. When the outsourcing concerns essential components and services we observe the setting up of close forms of cooperation between firms. Hiving off essential components and services requires a specific embeddedness of the outsourcing relation in order to guarantee its continuity and to retain the economic advantages of outsourcing in the long run. This makes demands on the macro as well as micro level. On the macro level these developments must be supported by legal and institutional frameworks (such as contract law and the attitude of branch organisations and the trade unions). On the micro level they make demands on the organisation of the firm's own activities, the coordination with the suppliers and the employees' willingness to work closely together with people from outside their own firm. The structuring and control of interfirm relations require the establishment of suitable management control systems and processes. This study is in particular aimed at the demands outsourcing relations make on the micro level. The question is: how can firms which enter into strategic alliances with other firms structure the management control of such interfirm relationships?

Management control and management accounting research usually concentrates on relations within organisations with varying degrees of decentralisation of decision making. Robert Anthony's (1965; 1988) well-known framework in which the decomposition of the organisation into responsibility centers is paramount, is the implicit or explicit point of departure for a lot of formal behavioural and contingency research in management control. In numerous organisations a horizontalisation of management control relations can be observed. These control relations are not hierarchically based but are relations between equal internal parties. Customer-supplier relation systems are being set up with forms of internal contracting (service level agreements), e.g. with respect to facility services (Van der Meer-Kooistra, 1994; Vosselman, 1996). There used to be captive buyers and sellers, but now it is no longer exceptional for departments to be allowed to deliver or to buy on external markets within rather flexible limits. Otley (1994) too observes such a horizontalisation and proposes a broader management control framework.

Research into horizontal management control relations should not remain restricted to intrafirm relations, but be extended to interfirm relations. Recently Hopwood urged '(the) examination of some of the accounting and informational consequences of more explicit concerns with the management of the supply chain and a more conscious questioning of what activities reside within and without the enterprise' (Hopwood, 1996, p. 590).

In the relevant literature little attention is given to management control issues with regard to forms of cooperation between independent companies (interfirm relations). It is in particular the strategic cost management literature (Shank and Govindarajan, 1993; Cooper, 1995) which draws attention to the importance of looking beyond the boundaries of the firm. These publications emphasise the value

chain approach, which not only focuses on the relations between the various subsequent activities within the firm but also on the firm's relations with the suppliers of raw materials, components etc. and the buyers. Berry (1995) also focuses on extra-organisational control problems, in particular control in network organisations. According to Gietzmann (1996) the role of the management accountant is changing due to control beyond the boundaries of the concern. When deciding on what should or should not be contracted out this role is much more complex than just calculating the production costs and comparing them with the market price. Make or buy decisions are becoming more and more of a strategic nature (see e.g. Tayles and Drury, 1997). 'The management accountant should play a critical support role in the strategy debate concerning which elements (subcomponents) of product development can be outsourced, which should be developed in house and which do not warrant development since off the shelf subcomponents suffice.' (Gietzmann, p. 624). Therefore the management accountant needs not only information about the production costs and market prices but he also needs information about the costs and benefits of the specific forms of governance connected with these choices.

Nowadays many make or buy decisions have evolved into what could be called 'extended make or buy' decisions. An extended make or buy decision can be divided into three separate, but inter-related elements. Firstly, the decision to purchase goods or services on a structural basis from third parties or to produce the goods or services in-house. Secondly, in the case of purchasing from third parties, the decision regarding the party or parties contracted. The nature of the party or parties influences the chance, and extent, of relational risks. Thirdly, decisions regarding the design of the internal management control system or the design of the outsourcing relationship. In fact, in the latter case there is also a management control relationship, involving more than one company. Due to bounded rationality, it can be expected that management accountants and other decision makers cannot possess all the information required for making an optimal decision at the initial decision moment. Many decisions about the design of interfirm management control relationships will most likely be made *after* the first decision of outsourcing activities has been made. In this paper we in particular address the second and third elements of the extended make or buy decision.

Up to now empirical research into interfirm relationships has especially centred on sectors like the automobile industry and consumer electronics. This paper, however, will focus on service relations, in particular on the way in which long-term interfirm relations between companies with regard to industrial renovation and maintenance can be set up and controlled. From recent publications (*cf. i.a.* Van den Hoogen & Sjamaar, 1997) it appears that outsourcing parties and suppliers of industrial maintenance in the Netherlands are giving much thought to problems of outsourcing and the setting up of partnerships and outsourcing relationships. Partnerships and contract forms are in a state of flux. An interesting aspect of industrial maintenance is that it is often strongly related to the primary process of industrial enterprises. Therefore, continuity in the service relation is very important.

We observe new forms of outsourcing maintenance activities within which not only the activities are being outsourced but also the management and coordination of the maintenance activities. These new forms require that people from the supplying and buying firm operate as one group, and that they use the expertise of all people involved in an integrated manner. In addition, it is important that the supplying firm should be willing to help solve the problems of the outsourcing firm and to take initiatives in the interest of this firm. These new forms of outsourcing relations may pose a threat, because they may have consequences for the employment situation in the outsourcing firm, and may lead to discussions about wages and other labour conditions due to usually worse conditions in the supplying firms. They may also influence people's positions in the outsourcing firm. Due to these consequences it is very important to think about how to set up interfirm relations, with which partner(s), within which contractual framework, about how to coordinate the relationship, and which management control mechanisms and processes can be used for supporting planning, measuring and assessing the activities and its results.

In this paper we investigate how interfirm relationships can be controlled. We build a model of the management control structure of interfirm relationships and indicate which factors influence the choice of the management control structure. This model describes how contractual relationships can be established between the outsourcing party and the supplier, and how the parties can cooperate with each other and handle the risks connected with the contracting out of certain activities. We will use theory, in particular transaction cost theory and trust based approaches, when referring to factors which are relevant for the drawing up of management control structures. First, taking the outsourcing party's point of view we will argue that choices in the structuring of interfirm outsourcing relationships are part of a so-called extended make or buy decision (section 1). In this section we will also discuss the outsourcing decision against the background of the transaction cost theory. We investigate which factors according to transaction cost reasoning are relevant to modelling interfirm relationships. In the next section (section 2) we will focus on the role of trust for the extended make or buy decision. We try to understand what trust means during the drafting of contracts between independent parties wishing to cooperate closely and for the processes of cooperation. Next, in section 3, we will build a model concerning the structuring of management control systems of outsourcing relationships drawing on factors described in the previous sections which are derived from concepts of the transaction cost theory and the notion of trust. In section 4 we will describe our case research design and will present a general description of developments in the outsourcing of industrial maintenance in the Netherlands in order to give a more thorough justification of our choice to perform case studies in the branch of industrial maintenance. In section 5 we will describe the results of two case studies into the structuring of the management control of an interfirm relationship with regard to outsourcing renovation and maintenance activities: a contract for renovation and maintenance at NAM, a Dutch gas and oil exploration company, and a maintenance contract at Shell Research and Technology

Centre Amsterdam. In section 6 we will investigate the implications of our case studies for our theoretical model. Finally, in section 7, we will evaluate the results of the study and present recommendations for further research.

Our model is the starting point in a process of theoretical development in the area of management control of interfirm relationships by means of case studies. It is important to stress that our research is not an illustration or a test of transaction cost economics or of trust based approaches. Nor do we want to test whether one theory (for instance transaction cost economics) is superior to another theory (for instance a trust based approach). Instead, what we are aiming at is the development of accounting and control theory. Humphrey & Scapens (1996) observe that the usual approach in case-study accounting research is indeed the other way round and that this had led to a situation 'where theory, or, more appropriately, theoretical development, seems largely to lie outside the world of academic *accounting*' (p. 91). By conducting case studies, we will try to refine our initial model. In fact, in doing so we are working on a process of 'theoretical generalization' (Yin, 1989). We do not claim that we are developing a theory that is universally true. In our view, each theoretical model has to be open to refinement or, ultimately, rejection. The need for refinement of the model can come from the academic community where rhetorics plays an important role (Arrington & Schweiker, 1992), but also from the interaction between academics and practitioners. Theoretical models can stimulate practitioners such as managers, controllers and management accountants to change their behaviour, with as a consequence that the model has to be modified. So by nature accounting theories seem to be changing through time (Humphrey & Scapens, 1996).

1. The extended make or buy decision from a transaction cost economic perspective

Decisions about the structuring of interfirm management control systems concern three phases of a transactional relation: a contact phase, a contract phase and an execution phase. In the contact phase control has to support the search activities for a suitable partner. Drawing up the contract has priority in the contract phase. In the contract *inter alia* the management control structure and processes are described: parties' authority and responsibility, the gathering and supplying of information, evaluation of the activities, payment structure, etc. The contract influence how the parties will cooperate in the execution phase. In this phase the transactions take place and the parties will control whether the activities and output are in accordance with the contractual rules. The parties also have to react to changes in circumstances due to which activities may be changed.

Which are the most important factors determining the structure and control of interfirm relationships during the three phases of such a relation? In this section we will focus on transaction cost economics, because this theory looks at governance structures which are suitable for controlling transactions. Transaction cost economics

is a reaction to neo-classical economic theory. In this theory the company is exclusively viewed as a production function, squeezed in between markets. Costs are interpreted economically as opportunity costs: gains missed due to not choosing the best among the non-chosen alternatives. In investigating the make or buy decision neo-classical economics uses a highly restrictive model of interaction between organisations (Gietzmann, 1996). The basic assumption is that the decision is based on a comparison of the production costs of the make alternative and the purchasing costs of the buy alternative, where these purchasing costs are related to the production costs of the supplying company. In neo-classical economics a full transparency of present and future market conditions is assumed. There is, in principle, standardisation: the products and the services have, in the opinion of the buyers, more or less the same quality. Factors like delivery times and reliability play no or hardly any role. All information can be found in the price. In the neo-classical view distinguishing three phases in a transactional relation is not relevant, because the price gives all the information needed during the period of the relation. Terminating the relation has no consequences, because a new relation can be started at any moment and on the same conditions.

In reality, this is hardly ever the case. The buy alternative requires mutual coordination and may entail dependency. The cooperating companies run the risk of one of the parties behaving opportunistically. Such behaviour may in particular have adverse effects when the parties have made specific investments for the sake of the relationship. Such investments may have no or hardly any value outside the relationship. The outsourcing party also runs the risk of the maintenance company performing poorly due to the lack of certain skills. Even when jobs are contracted out the outsourcing party will have to pay attention to mutual coordination and control of the activities and the expenses involved. Weighing the pros and cons of outsourcing is therefore only one part of the estimation of the costs connected with carrying out the activities in-house and the costs incurred in case of outsourcing. The latter costs comprise, apart from the sums charged for the supplied maintenance services, also the coordination and control costs and costs connected with the risk of opportunistic behaviour and poor performance. Strategic considerations, such as access to specific raw materials, components, knowledge etc., or striving for increasing flexibility, or exchanging skills, may also play a role in decisions whether or not to outsource.

The outsourcing firm also has to pay attention to consequences for internal labour relations. Outsourcing activities may cause changes in people's positions and in the number of jobs. When outsourcing implies the cancellation of jobs, employees can be dissatisfied with the internal labour relations. This can cause demotivation and even strikes which means that the labour relations will be influenced negatively for a long period.

It is especially transaction cost theory (Williamson, 1979; 1981; 1985; 1986; 1996) which takes the above mentioned factors into consideration. Transactions that involve specific investments, that are subject to uncertainty, and that recur at set times, run a high risk of one of the parties behaving opportunistically during the completion

of the transactions. In such a situation the parties are closely related to each other. Although at the outset there was a situation of competitive bidding, in the course of time the relation has been changed into a bilateral monopoly, in which (one of) the parties face(s) high switching costs when ending the relation. For example, when a contractor has invested in specific assets the outsourcing party can take advantage of this situation by forcing a price reduction. As the contractor cannot use the specific investments in another direction or only at a much lower value, he has to accept the price reduction. The chance of opportunistic behaviour can be reduced by placing the transactions in a hierarchy. Another possibility is completing the transactions through the market but reducing transaction risks by means of special agreements, for example by jointly investing in specific assets, exchanging hostages or linking the reward of the other party to the results of the transactions. In short, the transaction cost theory assumes that transactions can be completed by means of markets, hierarchies or hybrid governance forms. The hybrid governance forms require specific contractual agreements based on neoclassical contract law (Macneil, 1974), because this is a better guarantee for continuity and supports efficient adaptation in the course of time. The choice of the governance structure depends on the character of the specific transactional relation. By choosing the most suitable governance structure the firm can save on transaction costs.

Transaction costs may decrease in the course of time due to investments in information technology. As early as 1974 Arrow drew attention to the investment character of some transaction costs, in particular the costs of gathering and generating information (Arrow, 1974). Transaction costs may therefore consist of two elements: an element of capital investment, and an element of current costs (Arrow, 1974). The readiness of parties to invest in transaction costs depends to some extent on the likelihood that in the future 'gains' will be generated by the investment.

Thus, according to transaction cost theory the extended make or buy decision should be made by comparing the sum of production and transaction costs of the hierarchy as governance structure or those of a specific contractual agreement as governance structure. In case of a specific contractual agreement, transaction cost economics shows that there are three elements which determine the features of the outsourcing relationship and the control of the relation. These elements are: (1) the transaction, (2) the transaction environment, and (3) the parties. Being able to indicate which characteristics of these three elements influence in particular the design and function of the interfirm relationship improves our understanding of the changes in the cooperation processes. Transaction cost economics also shows that we have to look at all the three phases of a transactional relation and that we have to be aware of the transaction cost consequences of the control devices that are put in place in these phases. The factors that influence the size of the transaction costs concern all the three elements: transaction, transaction environment, and parties. Because transaction cost reasoning is based on the assumption that, in general, human beings are characterised by bounded rationality and opportunism, transactions that require specific investments provide for specific arrangements in order to safeguard long-term relations, especially

when the transaction environment is uncertain, due to which changes in circumstances in the future are unforeseeable. Frequent changes in technology, regular introduction of new or renewed products, and tough competition make the environment in which parties contract with each other very uncertain. The type of asset specificity also matters, because depending on the specific type different measures can be taken to mitigate opportunistic behaviour (Armour and Teece, 1980; Monteverde and Teece, 1982; Palay, 1984; Lundgren, 1990).

In addition to these factors transaction cost reasoning stresses the significance of institutional arrangements on the macro level that define the boundaries within which governance structures must be designed. Legal rules, policies of (inter)national and local governments, regulations set up by national organisations, such as trade unions and branch organisations, influence the options parties have for establishing interfirm relationships.

The choice of the governance structure will be influenced by a certain 'atmosphere' around transactions. The social context in which transactions are embedded influences the relationship and the parties' behaviour (Granovetter, 1985). The social embeddedness of the transactions can reduce the chance of opportunism. Social embeddedness will also influence the design of interfirm control relationships. Williamson (1993) holds that transaction cost economics is able to cope with social embeddedness. Societal devices, just like other devices such as communication systems, legal rules and regulations set up by national organisations, such as trade unions and branch organisations, are valued because they have the potential to economise on transaction costs. So, social embeddedness is part of the institutional environment of the transactions, influencing the choices of 'institutions of governance': markets, hierarchies or hybrids. By treating social embeddedness as an environmental factor Williamson denies the possibility of using trust as a means to reduce opportunism. Trust is a variable which can be brought into action in a transactional relation and which can be strengthened by the parties by taking the right actions.

There are other theories that stress the importance of the social embeddedness factor. In these theories much attention is given to the role of trust. In the next section we will go further into the meaning of trust for structuring the management control of interfirm relationships.

2. The structuring of interfirm relationships and the notion of trust

Various researchers, *e.g.* Zaheer & Venkatraman (1995), Chiles & McMackin (1996), Nooteboom *et al* (1997), demonstrate that trust play a role in cooperation and that coercion, incentives and trust are relevant aspects of governance. The presence of trust between cooperating parties is especially important in situations characterised by uncertainty and strong dependencies between the parties owing to specific investments. In such situations comprehensive contracts cannot be written and will in the course of time require changes and revisions of the agreements. In the case of trust

between the parties they will at the drafting stage of the contract assume that such revisions will be made to the satisfaction of all parties. It is easier for these parties to come to agreements. Zaheer & Venkatraman's (1995) studies support the claims of Macneill (1980) and Granovetter (1985), *inter alia*, 'that there exists a significant social component in exchange relationships which may be masked or missed in economic explanations of exchange' (p. 389).

Chiles & McMackin (1996) argue that when there is trust in a transactional relation the parties will make a lower estimation of the risk connected with providing incorrect or incomplete information, which decreases the need for an elaborate contract and the cost of drafting one. Chiles & McMackin claim that 'trust and risk are mutually interdependent' (p. 75), where managers see risk as the possibility of loss. Depending on the circumstances and the objectives the managers wish to achieve, the risk attitude of managers may vary from risk aversion through risk neutrality to risk seeking (March & Shapira, 1987). Chiles & McMackin assert that managers with a risk seeking attitude choose the market as governance structure even when asset specificity is relatively high. This in contrast to risk neutral and risk averse managers.

Trust may stem from previous contractual relationships between the parties or it may grow during a certain transactional relationship. In the latter case, trust may arise through the parties in a relationship being able to boast a common system of values and norms, as well as owing to the existence or growth of ties of friendship between the parties (Gulati, 1995). The network approach throws light on processes of trust creation. Trust is seen as an important variable for the explanation of the origin and growth of networks of organisations. Networks of organisations can be seen as a competitive strategy. By joining networks enterprises gain access to essential resources, enabling them to have more control over their activities (Håkansson & Johanson, 1988, Johanson & Mattson, 1987, Easton, 1989). Through repeated transactions between the actors in a network there arises a technical, procedural and social order between the actors. Transactions lead to mutual adaptation, which in its turn leads to investment in the relationship. Trust arises through learning and adaptation processes. These processes are necessary because they (a) strengthen the relations between the parties (adaptations make the parties mutually more dependent), (b) make the relation more durable (the parties learn how to handle possible conflicts), (c) indicate that there is some room for change in the relation, and (d) activate interaction between the parties so that knowledge is exchanged about each other and consideration for each other's interests is promoted (Johanson & Mattson, 1987, p. 39).

Sako (1992) makes a distinction between three types of trust: contractual trust, competence trust and goodwill trust. Contractual trust is based on moral standards of honesty and 'keeping your word'. It rests on the expectation that the other party will fully honour the agreements, whether put down in writing or not. Contractual trust is greater as people rely more on oral agreements. The moral standards are inculcated in individuals through socialisation and education. They contain the minimum amount of trust (laid down in ethical codes) needed for a society

to function, and form the precontractual basis of contracts (Durkheim, 1947). A total reliance on legal sanctions implies zero contractual trust, which would mean that no oral or written contracts would be concluded. Contractual trust is embedded in transactions. In our view, it is this kind of trust Neu is especially referring to when he claims that 'in less than perfect markets, trust must exist *prior* to contracting' (1991, p. 245). Furthermore, the more contractual trust, the less information the outsourcer wishes to gather for purposes of preventing or reducing opportunistic behaviour.

In the case of competence trust there is the expectation that the seller has the necessary technical and management competences at his disposal. Sometimes the buyer has the same competences, and sometimes not. Competence trust is greater according as there is less ex post inspection by the buyer of the goods or services supplied, for instance as a result of effective quality guarantees in the past. Competence trust may be acquired by purchasing existing competences or by investing in their development. In the latter case the outsourcing party is for example actively involved in the development of a product or service, or there is 'transfer' of technology to the supplier. Competence trust can be found in the institutional environment of a transactional relationship. Parties can improve their market position by certification of their products or services or by educational degrees. Furthermore, they can in the course of time develop a reputation by executing transactions in a trustworthy manner. But competence trust can also be gained during the relationship, through investments by the contracting parties.

Goodwill trust is based on the expectation that parties have an open commitment to each other. Commitment is the readiness to do more than is formally expected. Open commitment is the opposite of closed commitment. In the latter case certain explicit categories of requests are complied with, whereas in the former case other activities are also carried out as well, if and when this is expected to improve performance. In the case of goodwill trust there are no explicit pledges that have to be fulfilled (contractual trust) or predetermined professional standards that have to be met (competence trust). Trusting behaviour consists of activities increasing the vulnerability of the person involved with respect to another person whose actions he does not necessarily control (Gambetta, 1988). Shared values and norms are a necessary but not a sufficient condition for developing goodwill trust (Sako, 1992, p. 44). What is needed is a norm of open commitment and reciprocity. The particular form of the relationship is here characterised by an imbalance between obligations fulfilled and rewards received. In other words, parties should be prepared to be indebted to each other. Direct reciprocations are not even appreciated because they may be interpreted as a cautious hint that one wishes to terminate the relationship. Bills are therefore not settled at regular intervals. Goodwill trust can arise and can be developed in an established contractual relationship. It will decrease the perceived need of the outsourcing party for ex post information gathering.

It can be concluded from the discussion in this section that trust is an important factor especially in interfirm relations which require close cooperation between the parties. Close cooperation is necessary where the transactions are specially geared to

the demands of the outsourcing party, due to which switching costs are high and continuity of the relation is important. In addition, when the transaction environment is uncertain, parties know that in the course of the relation changes in the transaction conditions will occur. Parties want to know before concluding the contract that the contracting party is trustworthy, so that conflicts can be prevented when negotiations about contract renewal are necessary. In the contact phase parties will look at potential parties with a reputation of trustworthy behaviour and that have the technical and management competences to perform the activities well. Information about trustworthy behaviour can be acquired by looking at experiences with present or previous cooperation with other firms or with the outsourcing firm itself. It is important to draw up a contract based on rules and control mechanisms that further trustworthy behaviour and an open commitment. Such a contract creates an atmosphere in which goodwill trust can grow during the execution phase.

3. Structuring interfirm relationships: a model

3.1. Management control patterns of interfirm relationships

Using the insights from transaction cost economics and the insights based on the notion of trust we claim that from a management control point of view interfirm transactional relationships can have different patterns, within which different control mechanisms can be at work. In transaction cost reasoning interfirm transactional relations are hybrid forms of governance. Within these forms the transaction cost theory asserts that the control devices can be based more on mechanisms going with a market situation or on mechanisms used in a hierarchy. The social approaches which emphasise that trust can play a central role in interfirm relations, add to these two patterns of control devices a third pattern in which control devices are used which fit in a trust based relation. Thus, depending on the characteristics of the interfirm transactional relationship we can distinguish three patterns: (1) a market based pattern, (2) a bureaucracy based pattern, and (3) a trust based pattern. In the following we will describe these patterns. In the next section we will link them to the characteristics of the interfirm transactional relationship.

In the market based pattern the market mechanism is dominant. From the outsourcer's point of view, the contact phase of the transactional relationship is characterised by competitive bidding, because specific investments are not required. Many parties are able to compete for the contract. In the contract phase the parties will not spend much effort on writing detailed contracts. In such a situation all the market information is in the price and the characteristics of the parties do not influence the relationship. The market prices are directly linked to the output of the supplier's activities. The execution phase could involve periodical competitive bidding rounds, where other market parties can make their bids, thus disciplining the present supplier and stimulating him to work effectively and efficiently. The control device which will

be used by the outsourcing party concerns regular measurement and evaluation of the quantity and quality of the supplier's output and the timeliness of delivery. The payment for the supplier's efforts is directly linked to these measurements. Specific control instruments are not required.

The bureaucracy based pattern is linked to a bureaucratic mechanism that is dominant in a hierarchy. Essential to this mechanism is the existence of specified norms, standards and rules. Such a mechanism is in particular based on a system of surveillance, evaluation and direction and on a well developed system of information processing. In the contact phase specific potential suppliers are selected according to specified criteria. Next, the potential suppliers make their offers within prescribed procedures. Selection of the supplier(s) takes place by means of specified criteria in which the competences of the supplying parties are included. With regard to the contract phase, there is detailed and substantive contract writing. Contingencies are specified and the consequences for the transaction conditions are indicated in detail. The payment will be based on realised output or activities. In the execution phase the control instruments provide for frequent supervision, performance measurement and evaluation, in which regular information supply plays an important role. The quantity and quality of the output or activities will be measured regularly. Monitoring the performance of the supplier's employees is part of the control activities carried out by the outsourcing party. The requirements for 'ex post' information processing are described precisely.

In the trust based pattern trust between the contracting parties is the dominant control mechanism. In the contact phase, therefore, suppliers are selected on the basis of trust, stemming either from ties of friendship, from previous contractual relationships or from a reputation of trustworthiness. There is no detailed contractual writing in the contract, as the relationship is largely socially embedded. Contracts are framework contracts, which will be worked out in more detail in the course of time through personal consultation. Payment is not directly linked to activities or output. Parties could choose lump sum payment. Besides, there will be much sharing of risks between the parties. The control mechanisms will be processed oriented and culture based. Principles of fairness will dominate the relationship. In the execution phase control devices are aimed at the development of competence trust and goodwill trust. It is important that parties establish an open commitment to each other.

Our model is summarised in table 1.

TABLE 1. Management control patterns of interfirm relationships

	Market based pattern	Bureaucracy based pattern	Trust based pattern
Contact phase	competitive bidding	preselection of potential suppliers; bidding procedures; detailed selection criteria	trust, stemming from friendship, former contractual relationships or reputation
Contract phase	no detailed contracting; payment based on standardized activities or output	detailed and comprehensive contracting; payment based on real activities or output	intentional contracting; framework contracts; contractual trust; loose links between payment and activities and output
Execution phase	periodical, ex post competitive bidding	supervision; performance measurement and evaluation; detailed ex post information processing; direct intervention	personal consultation and coordination; development of competence trust and goodwill trust; process oriented and culture-based control mechanisms

Of course, the three management control patterns of interfirm relationships are

ideal types. In practice, we would expect to find elements of all three patterns in contractual relationships. Nevertheless, we would expect one mechanism to be dominant in a contractual relationship. Some combinations seem to be possible, such as market based devices in the contact phase and bureaucratic devices in the execution phase. Other combinations seem to be rare, such as trust based devices in the contact phase combined with strongly bureaucratic devices in the execution phase. We will use our case research to obtain a deeper insight into the structuring of interfirm relationships.

3.2. Management control patterns and contingency factors

In this section we link the three management control patterns with characteristics of the interfirm transactional relationship. We claim that the characteristics of the following elements of this relationship are relevant for choosing the most suitable management control pattern: (1) characteristics of the transaction, (2) characteristics of the transaction environment (market circumstances as well as the institutional environment), and (3) characteristics of the transaction parties. In the previous theoretical sections we have discussed the characteristics the transaction cost theory and the trust based approaches see as influencing interfirm relationships. In table 2 we sum up these characteristics.

TABLE 2. Characteristics of the contingency factors

Characteristics of the transaction	Characteristics of the transaction environment	Characteristics of the transaction parties
<ul style="list-style-type: none"> * degree and type of asset specificity * frequency and repetition * length of the transaction period * measurability of activities and output 	<ul style="list-style-type: none"> * uncertainty about future contingencies * degree of market risks * institutional environment (rules, systems and organisations) 	<ul style="list-style-type: none"> * information asymmetry * reputation * experience with cooperation in networks or with specific parties * risk attitude * bargaining power

In which situation we may expect which management control pattern? The market based pattern can be compared with the governance structure market in transaction cost reasoning. Thus, the contingency factors can be derived from the transaction cost theory. The transaction cost theory does not give enough points of departure for discriminating between the other two patterns. The transaction cost theory does not

regard trust, or in general a social mechanism, as an instrument which can be deployed. This theory regards trust at the most as a context variable. That is why we can only derive from transaction cost reasoning comparable contingency factors. Negatively formulated, in both patterns it regards circumstances within which a market mechanism will not be effective. Based on the reasoning of the approaches based on trust we can make differences between the bureaucracy based and the trust based pattern. We expect that a trust based pattern will belong to more extreme scores on the contingency factors, as a bureaucracy based pattern goes with more moderate scores.

For reasons of clarity we will present first the two most extreme patterns: the market based pattern and the trust based pattern. Next, we will discuss the bureaucracy based pattern. We assume that the transactional relation is for a long-term.

Which are the circumstances which leads to a choice for a *market based pattern*? The transactions are not characterised by investments in specific assets. That is why there are many suppliers during all phases of the relation. The quantity and quality of the output can be accurately described and measured. In the case of a longer transaction period the transactions are repetitive. The transaction environment is characterised by low uncertainty about future circumstances. Even when there are changes in the transaction environment the outsourcing party can start all over again with competitive bidding. If one of the parties behaves opportunistically the other party can choose another contracting party without high switching costs, because the parties have not made specific investments. In such a situation the institutional environment is not very relevant. With regard to the characteristics of the parties there is hardly any information asymmetry between them. Reputation and experience with cooperation in networks or with specific parties are not very relevant. The parties are in the same negotiation position and their risk attitude has no relevance due to low uncertainty.

The transactions which will be controlled by a *trust based pattern* are characterised by a high degree of asset specificity and high interdependency between the parties. It will be necessary for the supplying party to develop relation specific skills. Zaheer and Venkatraman (1995) speak in this connection of business process asset specificity, which incorporates components of both human asset specificity and procedural asset specificity. Human asset specificity concerns knowledge, skills and experience tailored to the other party's needs. Procedural asset specificity has to do with the knowledge of and experience with the workflows and processes of the other party, which are invested in by means of training and learning by doing. As the future contingencies are uncertain and cannot be predicted the parties are at each other's mercy. Switching costs are high, so the continuity of the contracting relation is of great value. The activities and output cannot be measured accurately. A contractual relation with these features must be firmly based on trust. Knowledge about a cooperative attitude and trustworthiness is required in advance in order to be sure about the social embeddedness of the relation. Without trust, especially competence and goodwill trust, a contractual relation will not be concluded. In this trust based

pattern the control instruments will be process oriented and will mainly have an informal and culture-based character. The institutional environment can stimulate competence and contractual trust, for example by certifying firms' activities and products and by legal rules. The parties are prepared to share risks. Information asymmetry between the parties can be overcome by developing goodwill trust. Regular personal contacts and an attitude of commitment can stimulate this. When one of the parties has more bargaining power, this power will not be used in order to develop goodwill trust.

A *bureaucracy based pattern* can be expected as the transactions are characterised by types of asset specificity which can be protected by contractual rules. Frequency of the transactions is high. The quantity and quality of the output or activities can be measured according to rules written down in the contract. The transaction environment is characterised by more or less uncertainty; future circumstances are more or less foreseeable. Competence trust and contractual trust are necessary for such a relationship. The outsourcing party can acquire information about the competences of possible contracting parties. This bureaucracy based pattern is strongly based on control instruments which are more aimed at direct intervention by the outsourcing party. The authority to intervene directly will be partly based on the bargaining power of the outsourcing party. The scope of the control structures and processes depends to a large extent on the nature of the activities to be carried out and the nature of the investments to be made by the parties. For example, when specific investments in human knowledge are very important for the quality of the work to be done a lot of attention will be paid to the quality of the persons deployed to carry out the activities. In this situation the parties must perceive high contractual and competence trust. The control is in such cases strongly focused on the knowledge and skills of the supplier's personnel. In addition, the scope of the control structures and processes will also be determined by the quantifiability of the activities and its output. If the output is very hard to quantify, the emphasis will rather be on the activities and on the input of personnel and resources. Parties will more likely have a risk averse attitude.

In table 3 we give an overview of the management control patterns and its contingency factors.

TABLE 3. Contingency factors and management control patterns

Contingency factors	Market based pattern	Bureaucracy based pattern	Trust based pattern
Transaction characteristics	low asset specificity; high repetition; measurability of activities and output; short to medium term contract	medium to high asset specificity which can be protected by contractual rules; low to medium repetition; measurability of activities or output based on contractual rules; medium to long term contract	high asset specificity; low repetition; activities or output cannot be measured well; long term contract
Transaction environment characteristics	many potential transaction parties; market price contains all the market information; social embeddedness and institutional factors are not relevant	future contingencies are more or less known; medium to high market risks; institutional factors influence the contractual rules	future contingencies are unknown; high market risks; social embeddedness; institutional factors influence the relation
Party characteristics	not important, because there are many parties with the same characteristics due to which switching costs are low	competence reputation; medium risk sharing attitude; asymmetry in bargaining power	competence reputation; experience in networks; experience with contracting parties; risk sharing attitude; no asymmetry in bargaining power

In the next section we will justify our choice to confront our model with case research. First we will justify the need for case research. Then we will elaborate our reasons for performing case research in the area of industrial renovation and maintenance. We describe the changes which are taking place in the outsourcing relationships in the Netherlands, in particular in the field of industrial maintenance. Next, we will describe the two cases: NAM and Shell Research and Technology Centre Amsterdam.

4. Case research in the area of industrial renovation and maintenance: a justification

4.1. Case research: research design

As we have seen the management control aspects of outsourcing maintenance activities are very complex. Till now the management control literature has paid little attention to interorganisational relations and how firms could control these relations. According to Yin (1989) case research is very suitable for the description and explanation of complex phenomena within its real-life context. Therefore, we have chosen the case research method. Case research is a research method which starts from a complex real-life context, and embarks on research in this complex reality on the basis of concepts and relations of existing theoretical frameworks. In our study we have derived the theoretical concepts especially from transaction cost theory and the notion of trust. We have structured our case research on the basis of these concepts.

The research was carried out at two companies that contract out maintenance. Both had a lot of experience with contracting out activities. The outsourcing relations we studied concern extensive long-term projects. Moreover, at both companies the outsourcing relations are of a different nature from the ones they had formerly entered into. The major differences are: (a) the contracting out of not only the maintenance activities but also the management of the maintenance, and (b) the granting of the contract to one party/consortium standing for numerous other parties (subcontractors). We gathered our data through interviews and documents. The interviewees are executives closely involved in all the three phases of the outsourcing relation. They are members of the project team which was involved in the design of the outsourcing relation, in the choice of the suppliers, in the drafting of the contract and in supporting the execution of the contract. In our study we interviewed both the outsourcing party and the suppliers. The interviews lasted two to six hours. The interviews were semi-structured. There was enough room for explanations and discussing other issues raised by the interviewees. The interview reports were sent to the interviewees for comments. In order to be well-informed about the developments and problems in the field of outsourcing maintenance we also contacted various maintenance suppliers and some advisers in this field.

4.2. Case research in industrial maintenance: some developments in the Netherlands

Due to the changes which are taking place in the outsourcing of maintenance activities studying the branch of industrial maintenance was quite suitable for our research purposes. Research has shown that many Dutch industrial companies are opting for maintenance outsourcing (Martin, 1997). Its volume is expected to double in the next eight years (Van den Hoogen & Sjamaar, 1997), involving not only short-term outsourcing due to peaks in the demand for maintenance that cannot be carried out by

the available maintenance capacity, but more and more often maintenance outsourcing of a structural nature. Especially in the nineties numerous companies, within the framework of the discussion about concentrating on core activities, have started to review their outsourcing strategies. The major reasons for the management of industrial companies to contract out their maintenance activities appear to be the following (*i.a.* Martin, 1997):

- * focusing on the core activities and the contracting out of non-core activities;
- * the in-house maintenance activities take place on such a modest scale that contracting out leads to 'economies of scale';
- * external maintenance companies are often able to perform maintenance services more efficiently than internal maintenance departments, since external companies feel the discipline of the market and internal departments are shielded from the market;
- * technological innovations, stricter safety standards etc. cause an increasing demand for the training of maintenance personnel. So maintenance requires an increasing amount of attention from the management;
- * an increased demand for flexibility; the production system must be capable of being adapted quickly to the requirements of a changing environment. Supposedly, the complexity of a change is smaller according as more 'professionals' are able to work more independently and on a comparatively restricted scale. In the case of outsourcing maintenance a necessary adaptation mainly leads to contracts being revised. This means that the contract-awarding company can direct its energies especially at the reorganisation and control of its own specific processes;
- * the decrease of the economic ties of the means of production (especially people), causing cost to be variable, the degree of which is of course dependent on the contractual agreements.

It appears from a study into the Dutch situation (Van den Hoogen & Sjamaar, 1997), that the maintenance and management of installations in the primary process is increasingly viewed as critical for the 'core business', for the free availability of such installations is of major importance for generating the companies' output. Still, the volume of outsourcing is expected to grow.

The critical importance of maintenance compels the outsourcing parties to pay a lot of attention to the design of the outsourcing relationship. It appears from professional publications (*i.a.* Martin, 1997) and from a symposium organised by the industrial maintenance oriented company HCG (HCG, 1997) that especially big Dutch suppliers of industrial maintenance (Stork, GTI, HCG) are trying to make their services more attractive for their customers by developing 'new' contractual relationships. The proposed, and partly realised, changes contain three main elements.

One of the elements which is subject to changes concerns the definition of the outsourced 'product' (the 'service'). Though in the past people were often hired from

outside, at present more and more often a working package is bought. Moreover, there is a tendency for the supplier to also (help) draft the maintenance plan (cf. for the meaning of this concept Gits, 1992) for the industrial company. A further development is for the supplier to assume the ownership of the means of production to be managed and maintained, after which the free capacity is made available to the customer for valuable consideration. Secondly, there is also a change in payment, which change is related to the change in the product definition. Until recently especially the actual use of the means of production was paid for at a certain precalculated tariff, but now payment is more and more often based on a standard activity programme (working package) at precalculated rates. In some cases the link between payment and maintenance activities is even completely severed, for instance when a percentage of the principal's sales is agreed as payment. Thirdly, we observe a change in the nature of the 'ex post' information exchange between the contractual partners. The integration between principal and contractor is stronger and there is a greater need for a relationship built on trust.

5. Case results

5.1. Case: NAM (Nederlandse Aardolie Maatschappij)

NAM is a natural gas and oil producing company with about 2.500 employees. NAM is a joint venture of two oil companies: Shell and Esso (with Shell as operator). It is the biggest gas producing company in the Netherlands and a successful company which operates in a certain market. NAM is hierarchically organised; working by fiat is usual. The organisation can be characterised as bureaucratic, as manuals and rules have a great influence on working methods. In the oil, gas and petrochemical branch safety, well-being, health and environment are very important strategic aspects which determine partly how the activities are performed, how performance is evaluated and information is processed.

NAM's core business is the exploration (including seismics) and production of gas and oil. NAM itself carries out all activities required for producing gas and oil and performs the planning of these activities (e.g. operating the control rooms and opening the valves). Almost all other activities are contracted out, such as the maintenance of the production locations (a couple of hundred) and rigs (ca. 20). NAM drafts the plans for the construction and maintenance of the locations, specifying the relevant requirements. The detail design and the work itself is then carried out by the contractors.

NAM's attitude towards the way activities are contracted out is changing. In the past well-defined activities were contracted out to many different parties. The planning, design and coordination of the activities carried out by the various parties were performed by NAM itself. This involved NAM doing the detailed planning, looking after the deployment of personnel, concluding price agreements, indicating when what

maintenance is to take place, etc. NAM is currently in a process of change which concerns the character of the activities that are being contracted out and the role of the contractors and NAM itself. The new way of contracting out activities provides for outsourcing not only the work itself, but also the management *cum* coordination of the work. Another major difference concerns the integrated approach of the activities. In the past NAM contracted out the various kinds of work to a number of different parties. For the painting a painting business was contracted, for the maintenance of the valves another company, etc. In the new approach all maintenance activities, from painting to installation maintenance, are to be contracted out to one consortium and this consortium hires subcontractors for the various activities. The integrated approach means that NAM only needs to conclude a contract with one party. In the case of the fragmented approach NAM had contracts with all suppliers. NAM has chosen this contractual form for several reasons. Because the consortium's members know the market better and are better informed about the qualities of the various subcontractors (they know their own business, whereas NAM is good at the exploration and production of gas and oil), it is more efficient for the contractor to do the subcontracting. This task requires the contractor to carry out the planning of the activities, and to come to agreements about prices, product quality, delivery time etc. with the subcontractors. The contractor in addition possesses more technical knowledge, as these activities belong to its core competences. Another reason is that the consortium's members face competition and are able to carry out the activities more efficiently and more cheaply than NAM can. Hiring one party to do all the work leads to being able to coordinate the activities more easily.

With reference to transaction cost reasoning, bringing more activities to the market governance structure instead of the hierarchical governance structure means that NAM can benefit from the advantages of the market, such as scale and scope effects and cost pressures, but also gain access to specific technical knowledge and knowledge of the maintenance market. This may pose a threat, because NAM will become more dependent on the contractor, and may also lose knowledge about planning and coordinating the outsourced activities due to which it will be more difficult to measure and evaluate the quality of the contractor's activities and output. To some extent this possible disadvantage can be anticipated in the contract. The new approach is a trade-off between the pros and cons. Due to NAM's long experience with outsourcing and NAM's strong bargaining position (they have the money and the work), and, in general, changing attitudes towards outsourcing activities, in the course of time the pros have outweighed the cons. All this has led to the contract we will be describing.

In May 1997 a new contract with a consortium of contractors was concluded. In 1998 a second contract was signed with the same consortium. The first contract concerns the renovation of all locations in the north-east of Groningen and the installation of compressors at these locations. The second contract concerns the maintenance of these locations. The entire project, with a duration of 25 years, is referred to as the Groningen Long Term Project (GLT project). For the GLT project

one quotation was submitted. The project involves an amount of about NLG 4.5 billion. The contract for the renovation and installation of compressors involves NLG 3.5 billion, and the maintenance contract about NLG 1.0 billion.

The Groningen field is one of the largest gas reservoirs in the world. The renovation of the existing locations in this field has become necessary because the installations at these locations are based on the technology of 30 years ago. In addition, due to the halving of the gas pressure the installation of compressors has become necessary. These compressors increase the gas pressure. Further, a change-over to electronic control of the locations is taking place. The renovation project has been started in 1997 and will last for about 10 years. The maintenance project starts in 1999 (when the renovation of the first location will have been completed) and has a duration of 25 years, from the contract date.

Only one quotation was submitted as there is a close link between renovation and maintenance. By making one party responsible for the renovation as well as the maintenance it will be in this party's interest to organise the renovation so that the maintenance can be carried out as efficiently as possible. In this way the replacement of parts can be geared as much as possible to the properties of the installed installations.

5.1.1. Contact phase

The renovation and maintenance project is crucial for the quality and continuity of NAM's activities. Outsourcing also the management of the activities meant a new approach which involves risks of becoming more dependent on the contractor. So, it was very important for NAM to know whether the contractor has the required knowledge and experience to carry out the activities as effectively and efficiently as possible and whether the contractor would not take advantage of its position in the course of time. NAM could mitigate these risks by choosing a contractor of which NAM has a favourable impression based on past experience and which is known as a reliable party with an open commitment. But, although NAM has a lot of experience with maintenance supplying parties, the contracting out procedure was open to all parties on this market, because NAM had to comply with European tendering legislation. Its most important requirements are public tendering and a fair tendering procedure. NAM spent a lot of effort on realising an open and objective procedure so that no party was able to protest against the tendering outcome afterwards. All in all the tendering process took two and a half years.

NAM first of all indicated the main functions of the project. These functions have to be available in the consortium. They are: delivering the compressor and electromotor, carrying out the construction work, installing the measuring and control system, and carrying out the engineering. For these five main functions NAM published five acknowledgment regulations. These regulations describe which tendering method is being used. For each of the main functions NAM indicated the requirements. On the basis of these requirements NAM selected 50 of the 150

companies that came forward. Next, NAM asked these 50 companies to form 5 consortiums and to submit per consortium an action plan (as yet without any cost estimate). These five consortiums then submitted their plans, after which NAM assessed the plans and their presentation and drew up a provisional shortlist of three consortiums. The assessment criteria involved the aspects of safety, health, well-being and the environment (SHWE); track record and experience with comparable projects; the way in which the consortiums have incorporated SHWE; the competitiveness of the bid (e.g. the height of prices, how incentives and penalties are used etc.); and the organisation of the consortiums. At the following stage the three remaining consortiums were asked to take part in a (paid for) design competition. They elaborated their plans and submitted bids. The plans and the bids were based on the concept of 'total cost of ownership'. NAM made the final choice on the basis of a lengthy list of (weighted) criteria in which the above-mentioned aspects were incorporated. In order to guarantee an objective evaluation the GLT project group which was authorised to organise the tendering procedure, filed the list of assessment criteria at another NAM-department before the invited consortiums presented their plans.

The design of the contract phase is determined by the European regulations. It was very important for NAM to comply with these regulations because being accused of not acting in accordance with them would have caused negative effects. NAM is aware of being a role model due to its strong position in the gas exploration and production market and its role in providing for heating and electricity needs in various countries. This has to some extent influenced the time and money spent on the tendering procedure. Another major aspect that has led to very careful procedures was that the outsourced renovation and maintenance activities determine the quality of NAM's core activities for a very long period. The GLT project has a duration of 25 years, which is unusual in this branch. During this period the dependence on the contractor's activities will increase, because the market situation that at the start of the project could be characterised by large numbers of potential parties will change in the course of time into small numbers. Through learning by doing, getting adapted to each other and to specific circumstances, knowing the features of the installations and being able to supply the required parts in case of replacement, the outsourcing relation will acquire even more idiosyncratic characteristics that will lead to increasing switching costs in the course of time.

Not only will NAM become more dependent on the contractor, but the contract is also very important for the contractor. NAM, in assessing the parties, did pay attention to the dependence of a party on this contract. An external party should not be allowed to become almost completely dependent on the order. This could decrease NAM's ability to terminate the contract prematurely due to its moral responsibility. This does not remove the fact that the order is important for the parties, as in the case of the renovation contract the parties have a 10-year horizon, in which they are largely assured of a certain use of their capacity. Per cluster the sums involved amount to between NLG 120 and NLG 130 million. Essential equipment is made to order.

5.1.2. Contract phase

Both contracts are framework contracts with options. The renovation contract covers an order for renovating 11 clusters (cluster = location) and an option on renovating the remaining 18 clusters. The option on the remaining 18 clusters means that NAM, after the renovation of the first 11 clusters, can renew the contract. This renewal will concern a limited number of clusters (e.g. three), after which another renewal can be awarded. NAM wishes to be able to continuously assess performance. In the case of poor performance NAM can cancel the contract prematurely. Framework contracts are highly flexible. The exact details for the daily operations are taken care of in work orders. In the framework contracts arrangements have been included about: prices and indexing formula for materials, personnel, computer and software costs; financial preconditions: incentives and fines (e.g. when certain safety standards are not met, the profit mark-up is cut by a certain percentage); legal conditions (e.g. the consequences of terminating the construction programme, insurances, liabilities); NAM staff secondment to the consortium's members; documentation requirements and the requirement of (weekly and monthly) reports; and preconditions regarding the subcontractors to be hired by the consortium (e.g. conditions concerning financial position, safety, environment, experience and skills, no labour brokers).

The legal structure of the consortium was also part of the negotiations. The companies cooperating in the consortium drew up a legal partnership. The advantages of this legal form are, firstly, that there is no equity causing problems if one of the consortium parties should be forced to quit the cooperation, and secondly, that the companies are individually liable.

During the drafting stage of the framework contracts attempts were made to anticipate as fully as possible the various conditions that might occur in the future. Here, NAM's experience with contracting out activities was utilised. These conditions for example concern the phasing of the activities (NAM deems it very important for the planned schedule to be met), the developments in the labour market (personnel costs), and important technological developments. The framework contract mentions the possible changes in circumstances and indicates how the parties should handle them (actions are described and the arbitration strategy in case of disputes is indicated).

In the contract arrangements have been included concerning the way of controlling the activities and performances of the supplying parties. These arrangements deal with the regular information processing requirements and personnel meetings, and how the activities will be evaluated and rewarded. The contract specifies that the consortium has to provide monthly information about: progress, costs, problems, commitments to be entered into with subcontractors, technical developments and problems, hours worked according to the time-clock, delivery of materials and material stock, and milestones. The format of the reports are indicated precisely. All changes in organisational structure and personnel to be deployed have

to be reported. The contract mentions by name key personnel to be deployed by the consortium. Changes of these persons or changes in their positions have to be reported and authorised by NAM. NAM has seconded some of its own staff with specific expertise to the consortium. The contract further provides for weekly meetings between the GLT project group and the consortium's project group in order to discuss the ongoing operations (in particular technical issues) and specific problems. In these meetings NAM can discuss their design requirements and can approve technical designs.

In the contract various evaluation arrangements are included. NAM has the right to audit the activities and their registration. Audits will take place on an ad hoc basis and NAM is to have access to all information (open book principle). NAM will also carry out regular 'quantity surveys' by means of which NAM measures the physical progress. A specific evaluation will take place after the renovation of the first cluster. The renovation of the first cluster will be completed by the end of 1998. In 1999 the renovation will be evaluated. The renovation of the three following clusters will start in 2000. The extensive evaluation of the renovation of the first cluster, which will last one year, particularly aims at acquiring a deeper insight into the efficiency of the technical work and the procedures followed, the hours needed for the various activities, the costs, technical problems etc. This makes more detailed planning possible for the work on the following clusters. The evaluation method beyond one year has not been specified in the contract, because NAM is responsible for the evaluation.

The control methods described in the contract provide for tight control of the activities and the commitment of personnel. By being informed about the commitment of key personnel NAM is able to evaluate their technical and management competences and to take action when NAM is not satisfied with their competences. In this way NAM assures itself of the quality of the work to be done. Another possibility to assess the quality of the work in advance is the weekly meetings in which technical plans and designs are discussed. Feedback control is carried out by ad hoc audits and 'quantity surveys', and also by evaluating the monthly reports. These reports give elaborate information about the daily operations. In order to be able to draw up precise norms and standards for the renovation activities NAM has claimed a one year evaluation after the renovation of the first cluster. In fact the renovation activities are repetitive. By performing a thorough evaluation NAM can standardise the next renovation activities. Standardisation will increase as NAM gains even more experience with these activities in the course of time.

NAM runs risks of time and money. The risks of not conforming to the planning are very crucial, as NAM has to comply with the gas demand which is at its peak during wintertime. So NAM carries out a tight control on realising the planning and on the accuracy of the planning. NAM has drafted a comprehensive contract in which possible changes in circumstances and their consequences are described. In addition, NAM has built in room for acquiring a deeper insight into the activities in order to be able to standardise them. This could also influence the method of payment.

In this business there are three usual methods of payment: (1) lump sum: this form is suitable if it is known in advance which activities are to take place; (2) reimbursement: the principal pays for the actually realised activities (man-hours, materials used, machine hours etc.) at pre-determined prices and tariffs; (3) a mixed form: the activities that are easy to estimate in advance are paid for according to the lump sum approach, while the reimbursement approach is used for other activities. At the start of the GTL project the mixed form was applied. But due to the evaluation after one year and the character of the work to be done - the clusters do not differ from each other - the parties will become more experienced, so the work can be estimated more and more adequately. Therefore, expectations are that the method of payment will change during the duration of the project and acquire ever more the nature of the lump sum approach. Furthermore, the contract describes the situations in which penalties or incentives will be applied. For example: if the consortium stays within the budget for certain categories of activities, or realises a better than expected performance in the fields of safety, environment or quality, the consortium will receive extra payments. Should the consortium underperform, then certain bonuses will not be paid.

5.2. Case: Shell Research and Technology Centre Amsterdam

Shell Research and Technology Centre Amsterdam (SRTCA) is a location at which research and technical services are carried out for the business units Oil Products and Chemicals of the Koninklijke/Shell Group (Shell). Shell has more research and technology centres in other countries, which also operate for both business units. The Amsterdam location is one of the biggest locations. SRTCA has a number of research laboratories. At the 27 ha location there are 160 small and large buildings and installations. The maintenance of all SRTCA's buildings and installations is carried out by Common Amsterdam Site Services (CASS), which is a supporting department of HSRA. Since 1984 the number of employees has been decreased strongly, especially by outsourcing ever more supporting services. The maintenance of the buildings and installations has been outsourced increasingly to external firms. The management, coordination and engineering of the maintenance was carried out by CASS itself. The employment at CASS has been decreased drastically in the past years. At the moment CASS has about 300 employees. In future it is expected that this number will decrease further. The nature of SRTCA's activities has been changed in the course of time. In the past much more attention was paid to fundamental research, nowadays the research emphasis is on improving existing processes and products. Supporting the business units' activities has priority. In doing so SRTCA has come closer to the market.

In 1995 SRTCA decided to outsource not only the maintenance activities but also the management, coordination and engineering of these activities. As of July 1 1995 SRTCA concluded a contract with a consortium. The contract includes delivery of technical services, maintenance of the buildings and installations, including test plants, at the Amsterdam location, and the management, coordination and engineering.

The consortium consists of four firms: HBM, HCG Industrial Services, BTO and Ergon. These four firms have established a new company operating under the name Huisaannemer Shell Research Amsterdam (HSRA). A five-year contract has been concluded. HSRA is a multidisciplinary cooperation that has at its disposal knowledge of the areas of mechanical engineering, electrical engineering and instrumentation, process installations and architecture.

This form of outsourcing maintenance is not new for Shell. Some Shell research labs in the United States have already got some experience with this new concept. Within four years the working hours for maintenance have decreased by 30% and customer satisfaction has increased substantially. Also has SRTCA some experience with this concept in the area of purchasing and information technology. The new outsourcing project differs greatly from the way SRTCA outsourced maintenance and technical services before 1995. SRTCA did the management and coordination, and gave orders for carrying out specific activities to about 35 firms. SRTCA decided how and when which activities had to be carried out, and did the engineering. In the new situation the consortium manages and coordinates the activities and performs the engineering. The activities are carried out by HSRA itself or HSRA calls in third parties. SRTCA has now one address instead of 35.

SRTCA's strategy consists of concentrating on core activities, i.e. research. This strategy is in line with the Shell strategy. In addition, SRTCA strives after increasing the productivity and quality of the technical services in order to decrease costs. The outsourcing project fits into this policy. The old situation with many supplying firms was very hard to control. There are two types of maintenance activities. On the one hand they consist of repairs and modifications of research installations. These activities concern a huge amount of small jobs which cannot be planned. On the other hand the activities concern institutional maintenance which can be planned. By outsourcing both types of maintenance to one party, and by also letting this party manage and coordinate the activities this party is able to plan all the work and the commitment of the available workforce. In addition, these activities belong to the core activities of this party, and this party has more specific knowledge at its disposal. SRTCA now only has to deal with one party which possesses all required specialised knowledge. This furthers a multidisciplinary approach and also stimulates planned and integrated actions instead of many ad hoc and often not coordinated actions. Moreover, SRTCA itself does not have all the required specialists. Now SRTCA can operate more flexibly. They can react quickly to technical changes by stopping certain activities and starting other ones.

The motives for the consortium parties differ from those of SRTCA. These parties operate on a difficult market with fierce competition and low profitability. They try to spread market risks by entering into long-term relations with outsourcing companies. Long-term relations are advantageous as a part of the workforce is sure to have employment. In addition, the consortium parties consider this contract as a pilot project in order to gain experience with this new form of outsourcing maintenance and to build up a lead in these developments.

5.2.1. Contact phase

The selection process for the new contractor was started early 1994. After the first selection stage a longlist was reduced to a shortlist of three potential contractors. These contractors had drawn up and presented their 'terms of references' in which they described how they would manage and carry out the maintenance, and elaborated their philosophy with regard to the cooperation. After this the number of potential contractors was reduced to two, with whom an intensive 3-month period of getting acquainted followed. It was considered of paramount importance for the relation between the companies to be excellent, for both parties were supposed to invest a great deal of money and energy into the partnership. Therefore the risks were to be minimised. This stage consists of a 'kick off' meeting of two days with either party and after that a visit to current projects (three days). In addition, the potential parties visited the Amsterdam location and they had to work out assignments. Eventually, in December 1994, HSRA was selected.

SRTCA used various selection criteria. An important criterion was that the contractor should have clear vision on how to manage and carry out the activities and should dare to take initiatives. The contractor should have clear identity and should be aware of his own professional qualities. This was important because Shell people have rather well-defined opinions. Another criterion was that the contractor should be able to operate as an independent firm in which the specialists should carry out the activities in an integrated way. SRTCA also paid attention to the quality of the organisation of the activities and its administration. An important requirement was transparency of the cost structure.

According to HSRA they were selected because of their open attitude, which was aimed at the client's wishes, but also because they had clear vision on the cooperation and on how to carry out the activities. Moreover, the expected work quality was important as laid down in the quality of the planned approach, attention to safety and quality, and also the consortium members' reputation was an important factor.

In this branch of industry the price usually plays a decisive role. This was not the case in this selection process in which a good relationship had priority. The selection of HSRA was based on their proactive attitude which showed initiative and clear vision. HSRA also showed an integrated approach and a transparent organisation.

5.2.2. Contract phase

The five-year contract can be seen as a framework contract in which the scope of the activities is described. Within this contract SRTCA regularly places orders. After SRTCA had selected HSRA as contractor working groups, composed of both parties, were installed which drafted the contract and the organisational, technical and administrative procedures as well as the way of information processing. They also

organised the required safety and quality certificates and the training of consortium employees. These activities took half a year.

In the framework contract both parties have stated their intentions regarding the relation. Both parties strive after optimisation of maintenance during the contractual period and eventually to realise an integrated technical management. The intention is to continue the relation if the cooperation works out well. It is explicitly mentioned that opportunism must be combated as much as possible. The outsourcing party should not think in terms of 'how do I prevent the contractor to earn too much', nor the contractor in terms of 'how do I at least compensate for my bad contract price with additional work'. Transparency is striven after in order to maintain and increase mutual trust. So the organisation and administration are set up in a transparent manner. Therefore the consortium is a legally separate firm which operates only for SRTCA.

The more precise implementation of the cooperation takes place through mutual consultation. The parties did not have the intention to draw up a comprehensive contract. Both parties attach great importance to building up the relation and enhancing trust. They work at such a growing relation by changing the old situation gradually into the new one. During the early stages HSRA made use of the earlier contracting firms. This gave them the opportunity to build up their knowledge of the installations and the site. Also the organisation of HSRA is being built up gradually and the scope of the activities is increasing continuously. This offers the opportunity to acquire even more insight into the maintenance figures which enables the parties to define performance indicators and targets. The parties have not determined in the contract how to divide the results of productivity improvements. More than two years after signing the contract they started the discussion of this subject. In 1998 a bonus system has been introduced by which realised improvements are divided between both parties. Important aspects of this system are the measurability of improvements and employees' bonuses. Orders are carried out on a time and material basis, i.e. the real hours and materials used are paid for at tariffs agreed in advance. The hour and material tariffs include jointly agreed mark-ups for overhead costs of the partners and for profits and risks. The realisation of targets (the measuring points are the performance indicators) are bonus-linked.

The parties have made arrangements about the way of controlling the maintenance activities and their results. Quality and costs are measured and reported regularly. SRTCA receives specified reports which make it possible to analyse maintenance. An important issue in the contract are the performance indicators and the improvement mechanisms. Productivity is measured every month by an independent organisation. The parties determine improvement targets. The productivity improvement goal in 1997 was to realise an increase of 5%. Underutilisation of people is measured and the reasons have to be indicated. They measure the performers and project management ratio as well as the indirect and direct hours ratio. Another performance indicator is the direct supporting hours and indirect hours ratio divided by direct working hours. Targets are drawn up concerning hours realised by HSRA employees and hours realised by subcontractors. Absence because of illness is

measured. Also clients' satisfaction is measured by looking at aspects such as safety, technical quality, service, efficiency and response time. The parties determine whether the agreed completion date is realised. SRTCA carries out a random value for money audit. Every year a financial audit is conducted.

5.2.3. Execution phase

Before this contract SRTCA had to deal with many contractors which had often carried out maintenance activities on the site for more than twenty years. Close ties existed with SRTCA employees. Because of this SRTCA employees were not very critical about the quality of the activities and the prices asked by the contractors. In the new situation SRTCA has chosen a certain distance between their own employees and those of the consortium. This may guarantee an objective relation. That is the reason why the consortium personnel is located in a separate building with their own canteen. Also by designing performance indicators which are measured partly by independent parties objectivity can be guaranteed. SRTCA characterises the relation as an objective partnership in which the outsourcer carries out many checks afterwards.

Till 1998 SRTCA clients gave their work orders to their own planning office. Now clients give their work orders right away to HSRA. All the work orders to an amount of NLG 2.500 are carried out by HSRA directly. Work orders between NLG 2.500 and 25.000 are first discussed with the client in which the estimated costs are part of the discussion. Work orders between NLG 25.000 and 100.000 are tendered publicly.

In the first year of the relation there was great resistance to HSRA. SRTCA employees related HSRA's arrival to the reorganisation which strongly decreased employment. SRTCA employees tried to give orders to the earlier contractors. That is why SRTCA has opted for building up the relation gradually and making use of the earlier contractors in the beginning, but subsequently through HSRA. That is also why SRTCA has cherished to a transparent relation in which performance can be measured and clear goals can be set. HSRA too is interested in measurable performance in order to show the quality and efficiency of the activities. The SRTCA management has strongly supported HSRA's position. This shows the existence of trust in the relation. At present the resistance mentioned above has been greatly reduced.

6. Comparing the case results with the theoretical model

6.1. NAM

Looking at the characteristics of the NAM case we can conclude that the chosen control relationship has the greatest similarity with the bureaucracy based control pattern. In the search for suitable parties meticulously elaborated selection criteria

were used. The eventual choice was based on a maximally objective assessment of the features of the potential parties. Although the contract concerns a framework contract NAM has tried to write a comprehensive contract which tries to anticipate as well as possible all future contingencies. In the contract the way of controlling the activities has been elaborated in detail enabling NAM to evaluate the quality, timeliness and costs of the activities precisely. In addition, in order to be able to work out the execution in greater detail an evaluation of the renovation of the first cluster has been built in after a year.

Considering the contingency factors we can conclude with regard to the transaction characteristics that we here have a very long term project, whose output can be measured well and whose activities are highly repetitive, for the clusters that have to be renovated are to a large extent identical. At the start of the contract there were many contracting parties which could carry out the project. The degree of asset specificity is medium, although we may expect that asset specificity will increase proportionately with the duration of the relation, because the chosen consortium will gain more and more experience with the maintenance activities and with NAM's specific requirements. This is partly stimulated by the concept of total cost of ownership which implies a close relation between renovation and maintenance. Due to this increase in asset specificity in the course of time terminating the relation will cause high switching costs.

The transaction environment characteristics can be described as uncertain, because the contract term is very long and it is very difficult to foresee the developments in the demand and supply of gas and oil for this long period. Although NAM speaks of a certain market it is very difficult to predict so far ahead technological developments and, for example, the influence of new gas finds. NAM is obliged to guarantee the gas delivery even in very cold periods. This requires NAM to plan the renovation according to a very tight schedule. In this connection the short term risks are also high because NAM's image is directly linked to a prompt gas delivery. An all-important institutional factor is that NAM is obliged to tender such projects according to the European rules. The transaction environment characteristics might have led to setting up a trust based relation from the very start, in which relation also goodwill trust would have played an important role. This would have meant that during the selection of the most appropriate party, in addition to certainty about technical competence and contractual reliability, particular priority would have been given to an attitude of open commitment and of willingness to realise a joint project, of which all consequences could not be foreseen in advance. Due to the European rules NAM had to choose a public tender based on objective criteria.

In addition, the choice of the control relationship was influenced by the party characteristics. Although NAM has a lot of experience with outsourcing activities, till now the outsourcing projects have had a much shorter term, with the requirements being described in detail and direct supervision of the contract execution. Moreover, NAM is managed in a bureaucratic way, usually with reference to manuals with detailed written rules and procedures. NAM does not have any experience with

management based on trust which is characterised by working out the detailed execution in mutual consultation in the course of time. As NAM possesses a strong bargaining position based on the 'who pays determines' principle NAM has been able to determine the managing and controlling of the relation.

Looking at the future we may expect that the relation will acquire ever more idiosyncratic features because the parties will become used to each other and will gain experience with letting various professionals coming from different firms work together. As more clusters are renovated the parties' knowledge as to how to carry out the renovation as efficiently as possible will keep increasing. The maintenance of the clusters has a high degree of asset specificity as well because the consortium has supplied the installations, and parts have been specially designed for these installations. As from the start of the activities the parties have decided to invest in the relation by learning under the supervision of an independent expert how to cooperate and to give each other some freedom of manoeuvre. We may expect these developments to lead to a control relation that will increasingly come to resemble the trust based pattern.

6.2. Shell Research and Technology Centre Amsterdam

The structuring of the control relationship in the SRTCA case contains many elements of a trust based pattern. During the search for suitable parties SRTCA invested in developing trust. An important selection criterion was also involved the linkage between the parties. Before making the definite choice SRTCA organised an intensive period of becoming acquainted with the remaining parties. The drafting of the contract and the contract contents also reveal a relation which is strongly based on trust. The contract has been drawn up in mutual consultation between the two parties and no attempts have been made to elaborate any fine points of the relation in writing. The point of departure for setting up the contract was that opportunism must be combated as much as possible. SRTCA attaches great value the consortium having room for taking initiatives and for carrying out the activities in accordance with their own views. Thus SRTCA tries to make use of the consortium's knowledge and experience and to realise cost savings. The control of the execution is in particular aimed at acquiring insight, on a regular basis, into the degree in which the goal of the outsourcing project has been realised, such as realising quality improvements and cost savings.

The transaction characteristics of the relation can be characterised as follows. The contract is aimed at a long-term relation. The contract term is five year, but if the relation develops satisfactorily SRTCA intends to renew the contract. The maintenance activities are partly repetitive and partly new. The activities and the required resources can be measured well. At the start of the relation the degree of asset specificity could be valued as medium. There were various market parties with the specific knowledge and experience required for carrying out the maintenance activities and its management. Asset specificity may be expected to increase as the parties learn

how to cope with each other and the consortium gains more knowledge and experience with the specific features of the buildings and installations and also with the procedures and customs at SRTCA. Terminating the relation in future will cause switching costs.

With regard to the transaction environment characteristics we can conclude that the market risks are medium. Research belongs to Shell's core business, even in the future. Nevertheless, the areas the research is focused on are subject to change, partly influenced by changes in technology. This will affect the approach and nature of the maintenance activities. The institutional factor of social embeddedness greatly influences the design of the relation. The earlier situation with many contractors with whom too close ties developed will not be allowed to return. Therefore a transparent relation incorporating as much as possible an independent position of the consortium and also their own location at the SRTCA site is greatly valued. The parties strove for the establishment of a transparent organisation and administration. All data are accessible and measurable performance indicators and targets are used. The SRTCA management is also interested in measuring and evaluating the achieved results on a regular basis in order to be able to show that with this new form of outsourcing improvements can be realised in the quality and efficiency of the maintenance activities. Thus resistance to this change among SRTCA personnel can be reduced.

In the choice of the consortium competence reputation has played an important role, involving technical competence as well as organisational competence. In addition, a self-starting SRTCA party with their own views on the maintenance was appreciated. SRTCA also tried to find a party with an attitude of open commitment and a risk sharing attitude. The contract was drafted in mutual consultation and the detailed outline of the relation was also agreed in close cooperation. In this process none of the parties is taking advantage of possible bargaining power.

7. Conclusions and recommendations

How can the differences that can be observed between the interfirm control relations outline at NAM and SRTCA be explained? Which factors play a decisive explanatory role and can these factors be found in the theoretical model established in this paper? Therefore, the question is: why has NAM opted for a more bureaucracy based control pattern and SRTCA for a more trust based control pattern?

NAM as well as SRTCA have chosen a revision of the outsourcing form they used until recently. They have chosen this form because placing the management and execution of the maintenance under the control of one party is more efficient and improves quality. In this way better use is made of the knowhow of the contractor and the coordination of the activities is made easier. This form allows the application of the 'total cost of ownership' concept which enhances the understanding of the financial

consequences of the maintenance. The new form of outsourcing makes for a closer relation between outsourcer and contractor, so that mutual dependence increases. Entering into such relations is only attractive in the case of long-term relations in which the parties can learn how the various kinds of expertise can be mustered in a maximally integrated manner and how the roles of the outsourcer and of the contractor can be defined. In the course of time these relations will acquire increasingly idiosyncratic characteristics and switching costs will grow.

The difference in the way the control relation is organised may already be seen in the contact phase. The way in which both parties made the eventual choice of the most suitable consortium has in the NAM case clear bureaucratic features, whereas in the SRTCA case trust features can clearly be discerned. This difference of approach can in the first place be attributed to European regulations the NAM has had to comply with. The NAM was obliged to invite public tenders where the choice had to be based on objective criteria. In addition, the outsourcing method is well-suited to the way in which the NAM is managed, where written rules and procedures and fiat from higher up in the hierarchy play an important role. SRTCA is a research organisation within which there is more room for initiative and creativity and within which rules and procedures play a less prominent role.

In the contract phase differences can be observed as well. These are partly in line with the described differences as to how both companies are managed. Furthermore, differences in maintenance situation and - related to this - employment situation play a role. Since 1984 SRTCA has started a policy of increasingly outsourcing supplying services. Due to this the number of employees has decreased sharply and this number is expected to fall even more. That is why the arrival of HSRA was associated with this decrease in employment and why there was great resistance to HSRA. In spite of the fact that Shell as an employer offers a high degree of employment security to its employees this does remove the fact that the arrival of HSRA influenced the positions of people. The SRTCA management knew it could expect resistance and had an interest in supporting HSRA and in being able to show that the aims of higher quality and higher efficiency could be realised by HSRA. The SRTCA management was forced to enter into a trust relation with HSRA in order to make sure that HSRA would execute the policy started as well as possible. Further, it was important to set up a transparent organisation and administration so that there could not be any discussions about the measurement and assessment of the results. At NAM the arrival of the consortium does not have any direct employment consequences and there is not any resistance either to the consortium. The project partly concerns new activities (the renovation) and partly activities (the maintenance) which had always been outsourced anyway.

The risk factor plays an important role as well. The GLT project involves more risks than the SRTCA project. The GLT project extend over a very long period and the contractual amount is also very high. The financial risks are therefore higher than those connected with the SRTCA project. Furthermore NAM has to deal with the possible risk that it cannot meet the demand for gas at a certain moment because the

planned renovation activities cannot be realised. NAM is obliged to guarantee gas delivery. For households and industrial buyers gas is a vital necessity, which has to be satisfied at all times. The availability of gas is a national affair. Should NAM not be able to satisfy the demand for gas at peak moments this will have far-reaching consequences for their image and perhaps their continuity. There is not such a high risk for the maintenance activities at SRTCA. Guaranteeing the safety of the gas locations and preventing harmful environmental effects also receive a lot of public attention. Should there be any calamities during the renovations and the maintenance activities, when carried out badly, this will also have serious consequences for NAM's image. This also holds for SRTCA, although NAM is more in the public eye than SRTCA.

The risks described together with NAM's negotiating clout ('who pays decides') has led to NAM extensively describing the work to be carried out and its requirements. In addition, there is a detailed specification of the control methods with respect to the execution. SRTCA has opted for fleshing out the relation as it develops and has not tried to write everything into the contract. Moreover, the relation will be worked out further in joint consultations between SRTCA and HSRA. Here negotiating clout plays no role.

If we now compare the factors pointed out as the major explanation of the differences between the two interfirm control relationships with the theoretical model we can in the first place establish that the institutional environment factor is in the model also considered one of the influencing factors. In particular, legal rules, institutional organisations and social embeddedness play a major role in the cases. Differences in negotiating power may according to the model also be an explanatory factor, which we indeed also come across in practical cases we studied. This also applies to the risk factor (degree of market risks, uncertainty about future contingencies) and the risk attitude of the parties. In the model risk difference, however, has a different effect on the design of the control relation. According to the model a lot of risk leads to a more trust-based relation, whereas in the NAM case the GLT project-related risk leads to elaborate rules and procedures and meticulous supervision. The SRTCA project involves fewer risks, but here, albeit for other special reasons, a trust based relation is chosen. NAM wants to control the risks as much as possible in advance by incorporating into the contract measures to this effect and obviously does not wish to neutralise these risks by entering into a trust relation with the consortium. This method of risk control dovetails with the way in which NAM is used to manage the company. We can conclude that an organisation's culture, *inter alia* manifesting itself in its management methods, is an important influencing factor. In the theoretical model this factor has wrongly not been incorporated. We have in addition observed that in the cases a company's history influences choices being made now. Thus we saw at SRTCA that the previous situation with the numerous contractors has influenced the design of the control relation. These historical situational conditions, too, are lacking in the theoretical model.

For future research into the design of interfirm control relationships it would be

advisable to especially look further into the importance of an organisation's culture and the (historical) situational factors. It would also be interesting to study in other cases what the effect of the risk factor is on the control relationship type. We in addition are planning, in the NAM and the SRTCA cases, to follow the developments in the relationships over a length of time in some detail. Will our expectations be justified that the relationships between the parties in the GLT project will develop into something more resembling a trust based control relationship?

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