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THE IMPACT OF INTER-ORGANIZATIONAL MANAGEMENT CONTROL SYSTEMS ON PERFORMANCE:A LONGITUDINAL CASE STUDY OF A SUPPLIER RELATION IN AUTOMOTIVE

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ABSTRACT

This study investigates whether appropriate management control design of supplier relations is associated with good performance. Although management control systems (MCSs) are found to be contingent on situational characteristics, it remains unclear whether this contingency fit contributes to performance. In order to illustrate the existence and refine the dynamics of the fit-performance association, we perform a longitudinal case study of an exemplary automotive manufacturer-supplier relation that was subject to considerable change and severe performance difficulties in the course of time. As proposed, case findings show that if the supplier is incapable of dealing with changed contingencies, a MCS contingency misfit is associated with poor operational performance. However, this misfit is only temporal, as the manufacturer adapts the MCS to fit the changed supplier relation and regain operational performance. In addition, the longitudinal data suggest that trust and basic formal control (i.e. formal control continuously exercised under all circumstances) are complements, while trust substitutes for extra formal control (i.e. formal control set up on top of basic formal control). Finally, our data indicate a timing difference in the substitutive relation. The building up of extra formal control proceeds gradually, while the lowering happens almost immediately.

Keywords: Management control; Trust; Performance; Supplier relationships; Manufacturing; Contingency theory; Case research; Automotive

INTRODUCTION

This study investigates whether appropriate management control system (MCS) design (i.e. contingent on situational characteristics) of supplier relations is associated with good performance. This performance association remains under-explored, contrary to the contingency fit between MCS design and situational characteristics, which is thoroughly studied both within and between organizations (Chenhall, 2003; Dekker, 2004). Nevertheless, the association between appropriate MCS design and performance forms contingency theory's main interest, as it explains the fit association (Donaldson, 2001). Despite this interest, previous contingency studies on inter-organizational management control only assume, explicitly (e.g. Dekker, 2004) or implicitly (e.g. Cooper & Slagmulder, 2004), that an appropriate MCS design contributes to performance. Following calls for more attention towards inter-organizational MCSs (van der Meer-Kooistra & Vosselman, 2006), this study aims at illustrating the validity and refining the dynamics of this assumption in practice.

For that purpose, we propose a theoretical contingency framework from the position of the buyer. On the one hand, this framework visualizes the association between contingency variables of supplier relationships influencing risks, and management control techniques governing these risks (cf Das & Teng, 2001; Dekker, 2004). On the other hand, the framework includes the association between degree of MCS fit on contingencies and risks, and performance. With respect to this association, we propose that if a supplier is incapable of dealing with changed contingencies, a misfitted MCS is associated with poor performance. Besides illustrating this *static* proposition, this paper also refines the fit-performance association by investigating the following *dynamic* proposition. If a supplier is incapable of dealing with changed contingencies, a misfitted MCS *only temporarily* aggravates performance, *until* the MCS is *changed* towards a design fitting the changed contingencies and risks and therefore contributing to performance (Kamminga & van der Meer-Kooistra, 2007; van Veen-Dirks, 2006). Corresponding to calls for this kind of research in the intra-organizational production environment (van Veen-Dirks, 2006) and inter-organizational joint ventures (Kamminga & van der Meer-Kooistra, 2007), we argue that it is worthwhile to investigate these propositions for supplier relations in a less studied phase of the supply chain, namely manufacturing (Cooper & Slagmulder, 2004; Langfield-Smith & Smith, 2003).[1]

[1] In other words, this study abstracts from the earlier supply chain phases of procurement (involving the make-or-buy decision, partner selection, contract design, etc) and R&D, primarily focused on by prior research. In terms of research methodology, this abstraction is put

More specifically, this paper presents an in-depth longitudinal case study of such a "manufacturer-supplier relationship" (MSR) between a Volvo Cars facility (VCG) and one of its high value-added just-in-sequence module suppliers (SAG). This research method is proposed to be strong in investigating the impact of MCS fit on performance, because it allows studying an extensive MCS of individual supplier controls (Ittner, Larcker, Nagar & Rajan, 1999; Dekker, 2004). The trend-setting automotive industry (cf Womack, Jones & Roos, 1990) suits this case research, because that sector is characterized by high levels of component outsourcing and extreme competitive pressure. As a result, manufacturers initiate continuous improvement projects with suppliers, which require appropriate MCSs to organize and manage the relation (Alford, Sackett & Nelder, 2000; Carr & Ng, 1995; Scannell, Vickery & Dröge, 2000). As the fit-performance association is only visible in relations changing over time, we specifically investigate a MSR that was subject to considerable change. To structure and interpret the longitudinal data in relation to our theoretical framework, we use the temporal bracketing and variance research methods (Rowe, Birnberg & Shields, 2008). Findings of this analysis confirm our theoretical propositions. After starting module production and delivery for two new extra Volvo models, SAG struggled to perform. As VCG's MCS no longer fitted SAG's increased contingencies and risks, the MCS aggravated operational difficulties. Therefore, it was changed towards a more appropriate design, fitting the level of risks and contributing to regaining performance. Furthermore, our case shows the importance of informal management control on SAG management and the active role of VCG in establishing this control by choosing SAG managers.

Furthermore, our longitudinal case study offers the opportunity to refine the either complementary or substitutive relation between trust and formal control, called for by e.g. Anderson & Dekker (2005) and van der Meer-Kooistra & Vosselman (2006). To that end, we distinguish two categories of formal control based on our findings. First, we define *basic* formal control as formal control continuously exercised under all circumstances. Second, we use *extra* formal control for formal control set up on top of basic formal control. Based on this distinction, our longitudinal data suggest that trust and formal control are complements *and* substitutes at the same time, depending on the level of formal control. In particular, trust and *basic* formal control are *complements*, while trust *substitutes* for *extra* formal control.

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into operation by studying a relation between a manufacturer facility and supplier facility that only deal with manufacturing, while procurement and R&D are handled by their respective mother companies.

Moreover, the study indicates a timing difference in the substitutive relation. The *building up* of extra formal control proceeds *gradually*, while the *lowering* happens almost *immediately*.

The remainder of this paper is organized as follows. In the second part, we provide an in-depth literature study, explaining and motivating the research question and case research design. The third part proposes a theoretical contingency framework and accompanying propositions, which guide our case analysis. In the fourth part, we briefly discuss the details of the case methodology. The fifth part forms the actual case study and presents the selected MSR. We describe this relation's characteristics and performance through time and indicate how the governing MCS changed during periods of fluctuating performance. In the sixth part, we discuss our findings, also concerning the relation between trust and formal control. Finally, we conclude this paper by summarizing the main findings and highlighting some avenues for further research.

LITERATURE STUDY

The aim of contingency theory is explaining the structure of organizations by particular circumstances (Lawrence and Lorsch, 1967). For management control research on inter-organizational relationships (IORs), this means explaining how the MCS on another firm, which creates bilateral incentives to pursue mutual goals, is designed within its environmental and organizational context (Chenhall, 2003; Luft & Shields, 2003; Nixon & Burns, 2005). Consequently, numerous studies examined the contingencies of MCS design from several angles. These angles include outsourcing (e.g. Langfield-Smith & Smith, 2003; van der Meer-Kooistra & Vosselman, 2000), inter-organizational cost management (e.g. Cooper & Slagmulder, 2004), partnerships (e.g. Seal, Berry, Cullen, Dunlop & Ahmed, 1999), strategic alliances (e.g. Dekker, 2004), networks (e.g. Kajüter & Kulmala, 2005) and joint ventures (e.g. Kamminga & van der Meer-Kooistra, 2007). However, it remains unclear whether the contingency fit between the MCS and situational characteristics, found in those studies, influences performance. For example, the service outsourcing cases of van der Meer-Kooistra & Vosselman (2000) and Langfield-Smith & Smith (2003) do not provide indications of MCS's impact on performance. Contrary, Kajüter & Kulmala (2005) explicitly incorporate performance as outcome variable in a contingency framework, explaining the use of open-book accounting in networks. Nevertheless, they do not provide evidence on the performance impact of open-book accounting either, as this impact appears too difficult to precisely assess (Kajüter & Kulmala, 2005). Comparably, Dekker (2004) acknowledges that in his strategic alliance between a supplier of railway safety system components and the

Dutch Railways, "no assessment could be made of the performance consequences of the alliance and in particular of its governance structure" (Dekker, 2004, p. 47).

Nevertheless, performance forms the central variable in the contingency theory of organizations, which aims at explaining organizational success or failure (Donaldson, 2001).[2] In essence, the paradigm of contingency theory contains three core elements (Donaldson, 2001, p. 7), which, applied to MSR management control, are the following. First, certain contingencies such as task uncertainty and environmental uncertainty are associated with MCS design. Second, these contingencies determine MCS design, because changing contingencies cause the manufacturer to change the MCS design. Third and most importantly, a fit of the MCS design and the influencing contingency variables results in higher operational performance, whereas a misfit decreases performance (Donaldson, 2001)[3]. Undoubtedly, this third association, stipulating that a MCS fitted on situational characteristics benefits performance, forms the underlying assumption of studies investigating contingency associations of inter-organizational MCSs (Dekker, 2004; Kamminga & van der Meer-Kooistra, 2007). Yet, empirical evidence on the validity of this assumption is limited.[4]

[2] This paper uses Donaldson's (2001) categorization of contingency theory elements. As a result, our study assumes a contingency approach to fit instead of a congruence approach, which are two very different approaches to fit with respect to the link between fit and performance (Gerdin & Greve, 2004). More specifically, the congruence approach assumes that a MCS fit on contingencies is the result of a natural selection process. Consequently, only the best performing firms survive and are therefore observable at any point in time. As there are no low performers, the congruence approach has no interest in the link with performance. The contingency approach, however, assumes that both high and low performers exist, because more or less successful MCS fits occur for extended periods of time. Hence, the goal of the contingency approach is to study performance fluctuations that depend on the fit between the MCS and its situational contingencies (Gerdin & Greve, 2004; Luft & Shields, 2003).

[3] Actually, the third element of contingency theory lies at the heart of the contingency theory paradigm, because it explains the other elements in the following way. When a MSR is confronted with a contingency change, it moves into a situation where the existing MCS, which fitted the previous situation, does not fit the new contingency level. Based on the third element, performance decreases. When this performance drop is sufficiently large, the manufacturer changes the supplier MCS to fit the new situational characteristics in order to avoid further loss. In other words, the MCS moves towards fit because of the performance loss of a misfitted MCS. Hence, a change in contingencies leads to a change in the MCS, which represents the second contingency element. This way, the MSR's contingencies and MCS move towards fit, which results in the association between contingencies and MSC, or contingency theory's first element (Donaldson, 2001).

[4] Obviously, the impact of contingency fit on performance has been studied in other management accounting research fields. One example of such a research stream is the performance effect of the fit between strategy and management accounting systems (e.g. Gerdin & Greve, 2004; Ittner, Larcker & Randall, 2003). Other examples of contingency research and the impact of fit on performance relate to management accounting techniques, such as Activity Based Costing (e.g. Cagwin & Bouwman, 2002; Ittner, Lanen & Larcker, 2002) and the Balanced Scorecard (e.g. Hoque & James, 2000; Maiga & Jacobs, 2003).

In the inter-organizational management control literature, only Ittner et al. (1999) and Anderson & Dekker (2005) quantitatively study the third contingency theory element.[5] In particular, Ittner et al. (1999) investigate whether non-price supplier selection criteria and supplier monitoring affect the association between supplier strategies (arms-length or partnership) and performance. Their survey data reveal that organizations with supplier partnerships, but without appropriate supplier selection and monitoring, display significantly lower performance than similar organizations utilizing more appropriate selection and monitoring practices. Anderson & Dekker (2005) focus their attention towards contract design (contract extensiveness and contract structure) and the potential negative consequences of a misfit between transaction characteristics and contract design. Their data comes from a large survey database of sourcing contracts for IT technology products and accompanying services. Comparable to Ittner et al. (1999), Anderson & Dekker (2005) find that contractually specified management control techniques that are better fitted on transactional characteristics decrease the probability of ex post performance problems.

Without questioning the contribution of previous survey research, both studies face two limitations. First, they appear hampered by the methodological obligation to limit the scope of the MCS to a number of (theoretically motivated) control techniques. Indeed, Ittner et al. (1999) focus on partner selection and monitoring, the latter being captured by supplier certification and face-to-face contact only. Furthermore, Anderson & Dekker (2005) exclusively look at formal management control in the form of the supply contract. Hence, as more comprehensive frameworks with both formal and informal management control techniques exist (e.g. Dekker, 2004), more research looking into the performance impact of both control types is justified (Anderson & Dekker, 2005). Second, survey data only reflect average inter-organizational practices, so that an examination of individual supplier controls is proposed to be more powerful to illustrate the impact on the relation's effectiveness (Ittner et al., 1999). As case studies offer the possibility to cope with both limitations, this type of research is put forward as a suitable type of future research on the impact of inter-organizational MCSs on performance (Ittner et al., 1999; Dekker, 2004).

[5] Also Leiblein, Reuer & Dalsace (2002) and Sampson (2004) study the fit-performance association, albeit from a more high level strategic orientation. First, Leiblein et al. (2002) study the performance impact of supplier governance fitted on relational characteristics in the semiconductor industry. More specifically, they model governance as the choice between internal production and production outsourcing to suppliers. Second, Sampson (2004) studies the cost of a governance misfit on transactional characteristics in R&D alliances. In particular, she investigates the governance alternatives of an equity joint venture and a pooling contract. Both papers use transaction cost economics theory and study governance structures corresponding to Williamson's (1991) hierarchy and market. However, neither paper looks into the actual MCS of the hierarchy or market, or acknowledges the existence of a hybrid form of governance.

Therefore, there already exist some case studies looking into this contingency relation. Klein Woolthuis, Hillebrand & Nooteboom (2005) study the relation between trust, contractual control and inter-organizational performance by means of four longitudinal case studies concerning collaborative innovation. Based on a cross-sectional comparison, the authors conclude that relationships characterized by trust are more successful, while the effect of contract completeness on performance is mixed (Klein Woolthuis et al., 2005). While Klein Woolthuis et al. (2005) investigate partner dependence, Yan & Gray (1994) study the effect of partner bargaining power on US-Chinese joint venture MCS design. Four case studies in different industries are described, based on which the impact on joint venture performance is assessed. Yet, performance levels differ both within and between joint ventures, leading the authors to conclude that the direct impact is not as straightforward as predicted (Yan & Gray, 1994). Finally, also Cooper & Slagmulder (2004) provide some insight in both the MCS and the performance of inter-organizational cost management (IOCM) practices, while theoretically explaining IOCM usage based on contingency variables.

On top of evidence being mixed, none of the previous case studies actually investigates the third element of contingency theory, which states that performance is not influenced by its *MCS,* but by *the fit between MCS and situational characteristics* (Donaldson, 2001). To our knowledge, the only case studies looking into this association, comparable to Ittner et al. (1999) and Anderson & Dekker (2005), are Heikkilä (2002) and van Veen-Dirks (2006). Heikkilä (2002) studies MCSs in the specific context of customer relations and investigates to what extent organizations design demand chain structures fitting specific customer situations and whether this fit benefits performance. The cross-sectional qualitative analysis of six customers involved in a Nokia efficiency improvement project provides a clear indication that a fit between customer situation and demand chain structure is associated with higher supply chain efficiency (Heikkilä, 2002). van Veen-Dirks (2006) investigates the fit between an organization's production environment characteristics and internal MCS design, its impact on operational performance and the MCS change to increase the level of fit (van Veen-Dirks, 2006). Yet, van Veen-Dirks' (2006) research remains within the boundaries of one organization and is based on complementarity theory. Heikkilä (2002) does study IORs, but only looks at customer relations. Hence, it must be clear that case evidence on the (most important) third contingency element between a contingency fitted MCS and performance is scarce. This study aims to fill this research gap.

THEORETICAL FRAMEWORK AND RESEARCH PROPOSITIONS

To illustrate the validity and refine the dynamics of the third contingency element in practice, we propose a theoretical contingency framework for MSRs from the position of the manufacturer, which can be found in figure 2.1.

Insert Figure 2.1 About Here

The constructs on the left hand side visualize the associations between contingency variables influencing risks and management control techniques governing these risks.[6] The degree to which the level of management control fits the level of risks is conceptualized by means of the degree of fit construct, which visualizes the association with operational performance.

MSRs are subject to performance risk and relational risk. Performance risk is the probability of the supplier interrupting the supply chain and damaging the common goal. This goal is manufacturing as many products of the order book as possible, on time, with good quality and at the lowest possible cost. Relational risk implies the probability of the supplier acting opportunistically by not openly communicating or minimizing operational snags (Das & Teng, 2001). These risks are increased by four contingencies. First, task uncertainty relates to the complexity and added value of both the delivered product and its operational processes (Woodward, 1965). Second, task interdependence refers to the degree to which sequential subactivities of the value chain have been split up and made dependent on each other (Dekker, 2004). Third, environmental uncertainty regards general market uncertainties and uncertainty about unknown future contingencies (Langfield-Smith & Smith, 2003). Fourth, relational stability aim concerns the manufacturer's aim of continued future interactions with the supplier to build bilateral commitment (Cooper & Slagmulder, 2004).

MCSs contain two types of control, namely formal and informal control techniques (Langfield-Smith & Smith, 2003). Formal controls are explicitly set up to coordinate the MSR and include outcome controls and behaviour controls. Outcome controls involve the measurement and evaluation of operational outcomes against pre-defined targets. Behaviour

[6] In the model, all contingencies interactively determine both risk types (cf Kamminga & van der Meer-Kooistra, 2007; van Veen-Dirks, 2006). As a result, the model simultaneously depicts the associations between contingencies, risks and management controls.

controls concern specifying, monitoring and evaluating compliance with pre-specified planning, procedures, rules and regulations (Dekker, 2004; Merchant, 1998; Ouchi, 1979). Informal controls are not explicitly designed, but are grown out of shared norms and values (Merchant, 1998; Ouchi, 1979). Especially trust building has emerged as an important informal control instrument in inter-organizational MCSs (e.g. Dekker, 2004). Sako (1992) distinguishes three types of inter-organizational trust building, namely building contractual, competence and goodwill trust.[7] Besides trust building, MSRs are governed by clan control (Ouchi, 1979). Based on shared norms, values and a common goal, suppliers are motivated to achieve that goal (Das & Teng, 2001) because of inter-organizational social pressure (Speklé, 2001) exerted by the manufacturer. In particular, poor operational performance leads to social sanctions for supplier managers (Bijlsma-Frankema & Costa, 2005), namely unpleasant confrontations with manufacturer management and personal humiliation, which render supplier underperformance and opportunism hard to sustain (Speklé, 2001).

To incorporate the fit-performance association, we add operational performance on the right hand side of the framework. Since product quality is emphasized more than timeliness and cost as supplier evaluation criterion (Waters-Fuller, 1996), we use this performance indicator to evaluate operational performance. In particular, we measure product quality by its most important evaluation metric in MSRs, namely percentage of defects (Gunasekaran, Patel & McGaughey, 2004). In automotive industry, this KPI is expressed in "parts per million" (PPM), i.e. the number of products claimed to be defective by the manufacturer out of one million products delivered by the supplier (Lowe, Deibridge & Oliver, 1997).

Following contingency theory's third element, the arrow from degree of fit to performance depicts our *static proposition*: a MCS fitted on MSR contingencies and risks is associated with good operational performance. Conversely, provided that the supplier is incapable of dealing with changed contingencies, a misfitted MCS is associated with poor performance (Kamminga & van der Meer-Kooistra, 2007; van Veen-Dirks, 2006). However, since that kind of misfit over time results in escalating control problems, further damaging operational performance (Dekker, 2004), such misfitted MCS is changed towards a more appropriate design (van Veen-Dirks, 2006). These dynamics form this study's main interest

[7] Contractual trust is based on the expectation that the supplier will keep promises and comply with agreements made, whether these are contractually stipulated or not. Competence trust concerns the expectation that the supplier possesses the necessary technical and managerial competences to deliver the order as agreed. Goodwill trust regards the expectation that the supplier shares an open commitment, with the willingness to perform activities that are beneficial to the MSR, but possibly neither in the supplier's interest nor required by the contract (Sako, 1992).

and further justify our choice for an in-depth longitudinal case study. In essence, we assume that MCSs are equilibrating and return to a stable situation after being disturbed (van Veen-Dirks, 2006)[8]. If contingencies, on which the MSR's MCS is fitted, change, the risk levels change, so that the MSR moves into misfit and its performance decreases. Therefore, the manufacturer changes the MCS to fit the new level of risks in order to avoid further performance loss. Because any manufacturer tends to adopt a MCS that fits situational risks, a change in risks leads to a change in the MCS. In contingency terminology, this change is called "Structural Adaptation to Regain Fit" or "SARFIT" (Donaldson, 2001). Consequently, we also study the following *dynamic proposition.* Provided that the supplier is incapable of dealing with changed contingencies, a misfitted MCS *only temporarily* aggravates performance, *until* the MCS is *changed* towards a design fitting the changed contingencies and risks and therefore contributing to performance.

RESEARCH METHODOLOGY

Case study research

An explanatory case study (Yin, 2003) suits studying these research propositions, as they involve refining existing inter-organizational management control theory from a dynamic perspective. More specifically, our case research seeks "to establish the plausibility of a specific theoretical perspective by demonstrating its capacity to illuminate some previously unappreciated aspect of management accounting practice" (Keating, 1995, p. 69). Indeed, the goal of this study is to refine inter-organizational management control theory by illustrating that a misfitted MCS, aggravating performance, is changed towards a design fitting the contingencies and risks and therefore contributing to performance.

Several inter-organizational management control case studies (e.g. Cooper & Slagmulder, 2004; Dekker, 2004; Kamminga & van der Meer-Kooistra, 2007; Nicholson, Jones & Espenlaub, 2006) demonstrate that MCS design can be adequately investigated by means of case research. The social meaning of a MCS and subsequent behaviour of companies and employees is very complex. Therefore, an in-depth study is needed to discover

[8] Consistent with economics theory, contingency theory largely depends on the assumption of equilibrium, stipulating that organizations utilize the MCS best suited for the MSR, i.e. the MCS fitting the MSR's risks. Yet contrary to economics, contingency theory (with a contingency approach to fit) assumes that also misfits occur for extended periods of time (Luft & Shields, 2003). Obviously, the outcome of such a misfit could be the end of the IOR. Yet in that case, the change towards a MCS fitting the new level of risks does not occur. Consequently, this kind of "equilibrium" without MCS dynamics is not interesting for our research. Therefore, we abstract from the possibility that the manufacturer changes suppliers. In terms of research methodology, this abstraction is put into operation by studying a MSR in an industry, in which manufacturers are not inclined to switching suppliers *during* the manufacturing phase.

how different parties respond to a situational change, how they change the MCS and whether that change has any effect on performance. This argument not only justifies the choice for a case study, but also forms the reason why more of this research is requested (e.g. Langfield-Smith & Smith, 2003; Dekker, 2004; van der Meer-Kooistra & Vosselman, 2006).

As theory refinement needs a clear theoretical starting point combined with openness to discover unexpected findings (Keating, 1995), we proposed a theoretical contingency framework to guide the data collection, but simultaneously used data collection techniques allowing sufficient openness. The collected data was longitudinal, because only such data can reflect changes in MCS design and performance, which are needed to illustrate the validity and refine the dynamics of the third contingency element (Luo, 2002). Only by means of a longitudinal study, we are able to answer the call for more research on MCS dynamics and its impact on performance (Anderson & Dekker, 2005; Dekker, 2004; 2007; Ittner et al., 1999; Scannell et al., 2000; van der Meer-Kooistra & Vosselman, 2000).

Like most inter-organizational studies, the unit of analysis is one dyadic relation between manufacturer and supplier (van der Meer-Kooistra & Vosselman, 2006). Dyer & Singh (1998) explicitly propose this "relational view", focusing on the manufacturer-supplier dyad, as opposed to the "industry structure view" and "resource based view", when analyzing cooperative strategy and sources of inter-organizational competitive advantage. Furthermore, we analyzed the relation after the manufacturer had decided to outsource the manufacturing activity. In other words, we addressed neither the make-or-buy decision nor related commercial negotiations, but collected data from the start of production onwards.

Case company selection

The selection of the case companies was influenced by two selection concerns: theoretical suitability and open and flexible access to senior management.

First, we chose the Volvo Cars Gent (VCG) production facility of the Swedish Volvo Cars Corporation (VCC) as manufacturing case company. On the one hand, we chose automotive, because this industry is considered a trendsetter in supplier relationships (cf Womack et al., 1990). Due to the high level of component outsourcing, extreme competitive pressure and resulting continuous improvement projects with suppliers, this sector needs appropriate MCSs to organize and manage supplier relations (Alford et al., 2000; Carr & Ng, 1995; Scannell et al., 2000).

Furthermore, our research regarding MCS dynamics requires a MSR that heavily changes and is not terminated due to potential unsatisfactory supplier performance. The manufacturing phase of an automotive supply chain fulfils this need. For example, the manufacturing and delivery processes of suppliers drastically change when a manufacturer starts producing a new car model. Moreover, manufacturer facilities are not inclined to switch suppliers because of a lack of capacity and sufficient supply quality at potential replacing suppliers. On the other hand, we chose VCG, because exploratory interviews learned that this manufacturer is considered a "best practice" by financial analysts, suppliers and umbrella organizations. For example, with respect to suppliers' capability for build-to-order, VCG's supplier park was evaluated best in a comparative case study, also including supplier parks of e.g. Ford, General Motors and Audi (Howard, 2006). In addition, VCG was subject to extremely changing supplier relations due to the introduction of two extra car models. Besides theoretical suitability, exploratory interviews with VCG management showed remarkable openness, interest in the research topic and willingness to cooperate.

Second, we chose SAG, the production facility of one of VCG's first-tier module suppliers, as supplying case company.[9] This high value-added just-in-sequence[10] supplier of VCG met our theoretical suitability requirement of facing severe operational difficulties over time without relationship termination. In fact, the supplier evolved from an exemplary supplier to a problematic supplier and back. Furthermore, SAG was very willing to participate in our study.

Data collection

The data gathering consisted of 17 semi-structured interviews with high level managers of both VCG and SAG. Interviews were held in three rounds between February 2006 and July 2007. First, all VCG managers involved with suppliers were interviewed, including responsibles for quality, logistics, logistic engineering, material planning, IT, HR and purchase. That way, we got a general impression of VCG, its suppliers and its MCS.

[9] For reasons of confidentiality, we call this production facility "Supplier Automotive Gent" or "SAG". The mother company headquarters are referred to as "Supplier Automotive". Concerning the delivered product, it suffices to know that SAG delivers a high value-added module. Examples of such modules supplied to VCG are seats, cockpits, engines, fuel tanks, bumpers, exhaust systems, door modules and wheels. For the same reason, the case description only refers to "X" and "Y" instead of people's full last names. Finally, we guarantee confidentiality by inserting an asterisk in interviewee quotes containing supplier characteristics.

[10] In order to reduce stocks and preserve maximum flexibility at VCG, components are delivered both just-in-time (JIT) and in-sequence. Just-in-time delivery means delivery when the car, for which the components are intended, has come onto VCG's final assembly line. In-sequence delivery implies delivery in the same order as the cars on VCG's production line. Suppliers delivering just-in-time and in-sequence are also called just-in-sequence (JIS) suppliers.

Second, we interviewed SAG management, in particular the plant manager and two middle level managers. We asked them to describe the history of the VCG-SAG relation. As a result, we got SAG's impression of the VCG-SAG relation, its history and its MCS, in the form of retrospective data, starting January 2000. Third, we re-interviewed three high level VCG managers specifically involved with SAG for several years. After asking them the same question, they added their view to the retrospective data of our study. Table 2.1 provides an interview data summary, describing the organization and position of the interviewees, the number of interviews, the duration of the interviews and the interview dates.

The interviews aimed at building a trusting relation and developing a dialogue with the interviewees, which permitted them to discuss their own concerns. All interviews were tape recorded electronically and structured by an interview protocol with open-ended questions, based on the theoretical framework. This approach allowed covering all framework constructs (i.e. theory attachment), while at the same time preserving openness for new findings (i.e. theory detachment). Interviews lasted between three quarters of an hour and two hours, with an average duration of approximately one hour and twenty minutes. Afterwards, all taped interviews were transcribed and sent back to the interviewees for feedback and final approval. The feedback was transcribed as well. Interview transcripts were written in prose, as to avoid offending interviewees by literally transcribing their words on a very sensitive topic. Furthermore, by writing in prose, we were able to immediately write out certain parts of the interview that were not entirely clear on the tape. As the interviewees approved the final transcript, we received absolute certainty on the written documents and all interpretations made during transcribing.

DATA ANALYSIS

The data analysis followed a structured iterative approach. Already during interview transcribing, a first analysis was performed by highlighting parts of the transcript and writing down comments and related personal ideas.

Then, both transcripts and personal notes formed the basis for a second analysis, which was completely done by hand. This analysis started with writing the case study, for which all transcript extracts were ordered chronologically. The most important techniques to enhance theoretical sensitivity during the coding process were asking questions (who?, what?, when?, where?, why? and how?) and making comparisons (Strauss & Corbin, 1999). Also the tape recorder was used, to capture facts and findings coming up during the analysis. As with interviews, these tapes were transcribed and further studied.

The coding process resulted in a document, containing an elaborate sample of ordered longitudinal data, which was used for writing up the case study.

Finally, we used the temporal bracketing and variance research methods to structure and interpret the case data in relation to the contingency framework (Langley, 1999; Rowe et al., 2008). Temporal bracketing means dividing the time length of a longitudinal case study into time periods, so that there are continuities of events within a time period and discontinuities of events between time periods. That way, temporal bracketing is suited for making comparisons of organizational change between time periods. The variance (or synthetic) method implies transforming original data from a story with events to a collection of variables that synthesize critical components of the events. These variables are the variables from our theoretical framework, which allow a longitudinal analysis on how change in the influencing variable, i.e. MCS fit on risks, affects change in the dependent variable, i.e. operational performance. Similarly to Rowe et al. (2008), we use both methods to make two types of comparisons, namely within period and between period comparisons. These comparisons provide the means to study our static proposition (i.e. a MCS misfit is associated with poor performance) and dynamic proposition (i.e. a change towards a more appropriate MCS contributes to a performance increase) respectively.

The case study description and following discussion were approved for publication by VCG and SAG, without having to make changes.

CASE STUDY DESCRIPTION: THE FALL AND REVIVAL OF AN EXEMPLARY MSR

The MSR between VCG and SAG started in 2000, when VCG outsourced the production of the module under investigation to Supplier Automotive, a global automotive supplier, for two new models on Volvo's P2 platform (Volvo S60 and V70). Therefore, Supplier Automotive set up a supplier facility (SAG) in VCG's supplier park to deliver modules just-in-time and in-sequence. Delivery volume fluctuated around 150.000 modules per year, which were produced by some 30 employees in two shifts. Following Supplier Automotive's low profile approach, many responsibilities such as finance and HR were centralised. This explains why the SAG plant manager was sent on secondment from another Supplier Automotive facility and was only present during office hours to concentrate on budgeting and reporting. Actual production and communication with VCG was lead by the production manager, with assistance of a quality manager and a logistics manager.

After production started without exceptional difficulties, SAG was awarded prizes related to outstanding quality and delivery to VCG both in 2001 and 2002.

> *During the start up of production for P2 and following years, SAG was a real exemplary supplier. If one would have asked me for our best supplier at that time, for example with reference to a new supplier, the answer would invariably be SAG. (VCG manager)*

Consequently, SAG's relationship with VCG was governed by KPIs (primarily PPM) follow-up, a clear syllabus (i.e. a document containing all agreements regarding the basic routines of day-to-day operational business), and a substantial level of trust in SAG's capabilities built on performance. Because nothing disturbed SAG delivery, VCG left the supplier alone. Also concerning Volvo's supplier team (STVC)[11], the SAG plant manager's interest and involvement were small, mainly because of his situation of secondment.

> *In the period 2000-2003, collaboration with VCG was exceptionally good. There were no problems. It was an ideal situation. That manifested itself almost in non-communication. VCG did not contact SAG, because everything functioned well. (SAG manager)*

This situation lasted until 2003. By that time, VCG had been awarded the production of two extra models on a new P1 platform (Volvo S40 and V50), which substantially changed production processes at SAG. First, production volume almost doubled to around 250.000 units per year by means of a second assembly line and doubled warehouse size. Second, producing four models created a variant explosion and a considerable increase in JIS supply flexibility. Third, the new module required more activities, so that SAG production activities tripled and became substantially more complex. Fourth, the volume increase required SAG to expand its headcount to some 100 people and introduce a third night shift. This new 24 hour system not only inhibited working over-time during the night in case of operational snags during the day, but also hampered control on employees, as the night shift was shielded from daytime management.

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[11] The purposes of the "Suppliers Team Volvo Cars" (STVC) are creating openness between all JIS suppliers and sharing competencies by the exchange of real life experiences in order to improve performance of all parties involved. To this end, all JIS plant managers participate in a monthly meeting in order to get to know each other, exchange information, jointly consider common problems and improvement programs, and set up and follow up on specific workgroup projects. Under the overall STVC, of which the chairman is a supplier plant manager, five inter-organizational workgroups exist (quality, logistics, IT, HR and finance). Workgroups meet monthly at one of the supplier plants to visit the plant and jointly discuss problems and improvement programs.

Although production of the new models started in January 2004, preparations began one year and a half upfront. Already during this project phase, some decisions were made that later contributed to the escalation of operational difficulties. In essence, SAG underestimated the changes and paid too little attention to change management, especially regarding the increased production volume and number of variants.

> *At that time, SAG management thought: "We are doing alright. The upcoming changes will not be a problem. There are some new variants for P1, but that will work out." Yet, P1 formed a variant explosion, which SAG management thought of handling the same way as before. In the end, this appeared problematic. (VCG manager)*

Instead of introducing the upcoming production changes into the organization, SAG considered producing the new products self-evident. That was visible in the information exchange towards VCG. Indeed, during the project phase, VCG installed cross-functional workgroups[12], to make sure SAG was capable of handling the new module supply. Yet, SAG's information concerning the new approach was very superficial.

> *SAG hung up a lot of fog and told VCG that certain issues would get solved, while on the work floor nothing happened. VCG approved a theoretical model, rather than real changes. (SAG manager)*

Obviously, this behaviour was only possible, because VCG expected all process changes to be taken care of based on previous outstanding SAG performance.

> *VCG controlled too little, maybe because of previous good experiences, and that way they got slightly deceived. (SAG manager)*

Furthermore, the responsibility of the workgroups mainly dealt with the VCG-SAG interface. As all related models were negotiated and approved, VCG did not have a bad feeling regarding the upcoming changes. Yet, despite this fine-tuning, SAG management neglected both to communicate the volume increase and all related modifications in the SAG organization and to prepare employees for new operational tasks. In addition, SAG received too little support from its mother company.

> *The introduction of P1 slipped out of their control. They forgot to talk to their own people and communicate the changes. (VCG manager)*
> *Supplier Automotive expected SAG to be self-sustaining, but did not provide resources for it, […] so that people were not adequately trained. Meanwhile, the management fooled itself. The entire system was doomed to fail. (SAG manager)*

[12] Four workgroups (information exchange and data management; packaging and logistics; supplier process- and product quality; human resources) investigate production and delivery related changes at the supplier by means of trial production runs and audits.

As a result, SAG exhibited gradually lowering operational performance from the start of production. Nevertheless, the supplier succeeded in covering up these problems.

> *SAG put those problems away under the form of overcapacity, increased stocks and scrap. At the start of production, a supplier is able to keep up such a strategy, because VCG sometimes only needs ten good quality [*] modules. With a capacity of 500 pieces, SAG always gets those out. However, the question is whether the supplier learns enough out of its experiences. It is normal to have problems, but the goal is to learn from them. SAG seriously lacked those problem solving capabilities. (SAG manager)*

As SAG's learning capacity was too low, the supplier displayed increasing operational difficulties, which already became catastrophic in June 2004. The PPM rate was multiple times higher than the target and the number of line stop minutes exceeded several hundreds.

> *At the start-up of P1, SAG started sputtering. That manifested itself in many rejections, an increasing PPM rate and especially stopping our production line several times; not by one minute, but by a large number of minutes. (VCG manager)*

VCG acknowledged these operational difficulties by escalating SAG to step four in the quality escalating activities procedure[13] in order to increase control and formalise performance complaints.

> *At the start of production, SAG was already in step two because of the introduction of the new models and the related risk, which required sharpened attention. After the start of production, SAG immediately moved from step two to four, without being accredited the normal three months to improve and without passing step three.[14] (VCG manager)*

Consequently, VCG installed several extra controls, starting with supplier review meetings. These regular meetings at SAG were lead by an expert team of VCC engineers and dealt with difficulties by asking questions, analyzing problems and studying action plans. Second, VCG contracted an external organization to perform third party inspection at the end of the SAG production line, for which SAG paid the costs. Third, VCG demanded SAG to perform extra quality controls both internally at SAG and externally at VCG, via a SAG staff member checking delivery quality at the VCG line, when SAG transportation racks were opened. Finally, VCG required SAG to take a digital picture of every module delivered. Besides these controls, VCG demanded SAG to work overtime during the weekend, to build up safety stock after problems during the 24 hour system work week. Furthermore, VCG

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[13] The aim of the escalating activities procedure is to indicate both internally (at VCG and VCC) and externally (to the supplier) that VCG is aware of the operational difficulties and installs adequate measures to help solving them. Those measures depend on the snag seriousness and are linked to the step the supplier is escalated in. Normally, all JIS suppliers are in step one. When encountering frequent problems with a supplier, VCG managers escalate the supplier to the next step. If the problem is not solved after a pre-defined period of time, the supplier is further escalated. The procedure ends when a supplier either reaches step five, which theoretically implies re-evaluation and potential re-sourcing of his products, or substantially improves, so that he returns to step one.

[14] According to official VCG documents, SAG did spent one quarter in step three. Yet, that is because the procedure only allows stepwise escalation. In reality, however, SAG was immediately put in step four and received all related extra controls.

wanted SAG's operational difficulties to get solved. To that end, VCG sent staff members to SAG.

> *I also wanted to make the link to the causes of problems, as those were unknown. (VCG manager)*
> *When VCG staff figured out that too little was learned at SAG, they showed more focus and came to SAG to ask questions. (SAG manager)*

More specifically, a supplier quality engineer and a logistics controller[15] were assigned to follow up on SAG, under supervision of VCG's local purchase responsible, Mr X, who had numerous years of experience with suppliers. His guidance was needed, because SAG was only recently assigned to the quality engineer.

> *The problem was that the engineer was only put on SAG recently, when everything at the supplier was under control. Consequently, he only did monitoring. […] He could not respond in the same way as a quality engineer with more experience. That is why Mr X took the lead. Yet, that still was not the same as with a more experienced engineer on SAG. (VCG manager)*

Because VCG did not expect difficulties with SAG due to previous good performance, VCG was surprised when severe performance problems arose, as was SAG. As a result, valuable time was lost in comparison with suppliers that were more strongly followed up from the beginning.

> *SAG management did not see the problem coming either and moved from very good performance into big trouble. People respond differently in that case. The good situation made us decide not to put too much energy in SAG, presuming that SAG management had everything under control. Somehow, this is a contribution of VCG to the escalation of the operational problems. (VCG manager)*

The VCG team visited the supplier daily, on some occasions two times a day and even at night or during the weekend. These supplier visits served two purposes, namely controlling and motivating SAG personnel.

> *On the one hand, we wanted to control whether SAG employees were busy and whether they were doing a good job. On the other hand, we wanted to motivate the employees and hearten them by signalling: "Guys, you are not alone. Your customer has seen it." (VCG manager)*

The control purpose followed VCG's damaged trust in SAG capabilities.

> *The lack of trust in their promises led to extra control. These controls were necessary to go to the supplier, when he did not carry out his promises. At that moment, I could show SAG management the results and say that the process was in fact not under control based on the results. After all, figures form physical evidence. (VCG manager)*
> *During the problems, VCG's control on SAG increased and VCG's trust in SAG decreased. (SAG manager)*

[15] Besides an escalating activities procedure for quality, VCG uses a similar procedure for logistics. As product quality formed SAG's main issue due to continuing operational difficulties, poor logistics performance mostly followed as a secondary consequence. Therefore, SAG was "only" escalated to step three of the logistics escalating activities procedure. This implied that a logistics manager joined VCG's team at SAG to provide input on SAG's performance, analyse problems and follow up on action plans.

To regain trust, VCG continuously questioned SAG's operational processes.

> *I continuously asked: "Why does the process stop and VCG does not receive [*] modules?" Then, I saw innumerable problems and continuously asked why certain operations were done this way, as production clearly sputtered. (VCG manager)*

However, VCG representatives were not received openly, so that very little progress was made.

> *SAG tried to keep these people away from problems by putting them around the table instead of showing them the work floor. This strategy was utilised until problems reached a climax and VCG management reacted by saying: "We have enough of it."(SAG manager)*
> *The plant manager was the core of the problem, because he was not capable of neither running the business, neither setting things straight. Instead, he covered up snags for Mr X. When Mr X was at SAG and asked how things went, the answer always was: "good, good", while in reality there were multiple issues. (SAG manager)*
> *My conclusion was that the formal exemplary supplier had been reduced to zero and did not have any structure, any management, nothing at all, left. The plant manager, however, always said he had things under control and would solve the problems. Yet, the next day was the same story. VCG had stopped because of SAG. (VCG manager)*

Consequently, by August 2004, the production manager had quit, after having unsuccessfully demanded extra resources from Supplier Automotive several times. The quality manager had left as well, as had his successor. Finally, the logistics manager had quit, which made headquarters decide to centralize the logistics function. Consequently, only the plant manager remained, but this manager appeared to lack appropriate communication and management skills. Due to limited employee monitoring, he suffered from internal control problems with SAG employees, which were hampered even more by a doubled production hall and the introduction of the night shift.

> *In 2004, serious problems arose and the same management was not capable of solving them in the short term, because they had created a social cemetery. They did not talk to people any longer. (VCG manager)*
> *At SAG, there even was sabotage in order to disturb the production process. One time, someone deliberately cut the computer cables of the [*] robot. (SAG manager)*

Furthermore, the plant manager experienced difficulties in his relationship with VCG.

> *The plant manager had a different style, in particular regarding communication. He had a very stiff approach and a totally different charisma compared to Mr Y. And the person of the plant manager plays a very important role in the relation that VCG has with a JIS supplier. (VCG manager)*
> *At a certain moment, I saw the plant manager running through his factory and scratching his hair. He seemed to have lost it. So, I said: "Our production line has stopped.", to which he only responded with "I know …", without being able to give a reason or a solution. That is when I said: "Apparently, you are here alone and you can not do it alone. This can not go on any longer. And you have to stop telling me that the problem gets solved, because I do not believe you any more." (VCG manager)*

For VCG, the tolerance limit for SAG's operational problems was reached. Based on high pressure from Mr X, the plant manager was removed by Supplier Automotive.

> *To the [*] managers, I emphasized: "SAG has to stop shutting down VCG, because SAG jeopardizes the future of VCG and the other suppliers in the supplier park, which also stop and suffer financial and reputation loss. So, how is Supplier Automotive going to support SAG?" […] The following day, Supplier Automotive had removed the plant manager. (VCG manager)*

As a response and attempt to regain VCG's trust, Supplier Automotive sent several new managers to SAG, including an interim plant manager from another Supplier Automotive facility. VCG staff kept visiting SAG twice a day and met management to jointly discuss priorities, walk through the factory, analyse problem causes and decide on which snag to tackle first. This situation went on for several months, but without substantial performance improvement. The PPM rate decreased from its highest rate in September 2004, but remained too high. Rather quickly, the interim manager appeared not capable of restructuring SAG either.

> *The manager was very good in technical aspects, but exceptionally bad in managing social aspects. So instead of dealing with the workforce, which was far too large for the production volume, the plant manager considered all problems technically based on his experience in the other Supplier Automotive facility. Yet, that facility manufactures simple and standardised [*] modules, so that the standard concept suited for that production unit did not suit SAG. (SAG manager)*

It was suggested that the plant manager only addressed symptoms, installed technical solutions like a pick-to-light system to solve picking errors and hired more employees to operate the more complex production systems. Yet, none of the technical solutions worked properly and none of the new operators knew how to operate the new system adequately. During supplier visits, already going on with the previous SAG management, VCG staff inspected employee working instructions and product control instructions, which all appeared deteriorated.

> *There were no instructions, so that the operator carried out his assignment and then just stood there watching and waiting for his next assignment. Also control instructions were disintegrated. […] There were moments that I called SAG and told them: "Our production line has stopped. Do you know that?", to which SAG responded: "Stopped? No, I did not know, but I will have a look." (VCG manager)*

As a result, VCG's trust in SAG's capabilities disappeared completely, which was formalised by stripping SAG of its Q1 Award[16] in November 2004. As SAG had already failed to renew other quality certificates[17] as well, the interim plant manager left, so that SAG again needed a new one.

> *During the problematic period, we lost all trust in SAG management. (VCG manager)*
> *By the end of 2004, VCG only distrusted SAG. (SAG manager)*

[16] The Q1 Award is a very demanding quality standard of VCC, indicating that a certain supplier satisfies quality requirements and is worth delivering VCC. The award is received based on an evaluation of PPM performance, an audit of business operating system parameters (e.g. profitability), recommendation letters of customers and the possession of standard automotive quality certificates.

[17] Two examples of standard quality certificates in automotive are ISO-TS and ISO-14000. These certificates need renewal every three years, but in 2004 SAG failed to apply for renewal.

However this time, the plant manager of another VCG JIS supplier, Mr Y, put himself up. When Mr X learned about his candidature, he considered this manager to be the manager SAG and VCG needed. Consequently, he personally telephoned Supplier Automotive.

> *At that time, I was already six years plant manager at [*], a company that had performed very well all those years and of which the challenge was somewhat gone. (SAG manager)*
> *I asked them: "I know there is a candidate for the position of plant manager at SAG. What are you waiting for? It is not my decision, but yours, but I think this man is the right person for the job and I can recommend him. Furthermore, there is no more time, because the difficulties have been going on for months. You have to decide now and according to me, this is the right person." (VCG manager)*

Undoubtedly, this telephone call accelerated the appointment of Mr Y as new SAG plant manager. In January 2005, he started talking with SAG staff at a time when wages were not paid in time for several months and employees considered going into a strike. In March 2005, he actually started as plant manager.

> *The new plant manager, Mr Y, is totally different and manages in a different way, namely by talking to people and listening to their problems. He also came to listen to VCG in order to find out what went wrong. (VCG manager)*

First, Mr Y dealt with the employee excess by laying off fifteen employees and two team leaders. Second, he built on his organization by immediately hiring a new quality and HR manager and a few months later also attracting a production manager and logistics supervisor. That way, rolling stock was halved and the production hall was not packed with merchandise and scrap any longer. Furthermore, Mr Y's management qualities played an important role in the recovery of SAG performance.

> *If SAG would not have had someone like Mr Y, the turnaround would not have succeeded. (VCG manager)*
> *Because of the coming of Mr Y, many things changed substantially at SAG. (SAG manager)*

Mr Y listened to SAG employees' problems, instead of only listening to VCG's problems. Furthermore, he eliminated over-engineering out of the production process. Based on the Plan-Do-Check-Act approach, he analysed problems and tackled causes instead of fixing symptoms; all in cooperation with VCG.

> *Because of his personality and his approach, a change set in, a restructuring. (VCG manager)*
> *Thanks to the influence and the crisis management of Mr Y, we have succeeded in dealing with the causes of the problems. (VCG manager)*
> *I dealt with meetings differently and went searching for causes instead of symptoms, so that no frustrations arose. […] I worked with VCG managers that had the necessary maturity, like Mr X. (SAG manager)*

As manufacturing activities became simpler and easier to maintain, reliability increased. Operation processes were optimized by discussing snag occurrence and preventive measures with operators. Moreover, training of new employees got a lot of attention, stimulated by VCG, as SAG activities require very specialized skills.

Undoubtedly, the relationship with VCG played an important role as well. First, Mr Y really enjoyed VCG's trust from the beginning, which helped to open doors within Supplier Automotive and get the resources needed to change things.

> *I received the trust of Mr X to carry out things at SAG. Through him, I also got the support of VCC in Sweden. Furthermore, I already had other contacts both at VCG and VCC, and in general got everyone's trust based on the good references built up during my career. Therefore, Supplier Automotive had to take me into account. (SAG manager)*
> *SAG started with more than a clean sheet, because they had a new plant manager, who we already knew and in who we already had lots of trust. Therefore, it was easier for us to open up for even more trust than in the case of an unknown new plant manager. (VCG manager)*
> *That pressure [on timing] also went up to the mother company in [*], which was asked to send specialists, for example to give training regarding [*]. I have the feeling that the pressure of the customer opens certain doors in the own supplier organization. (VCG manager)*

Second, VCG's involvement was always constructive. The automaker brought along many ideas, which SAG did not need to follow, but at least formed a source of inspiration. SAG never got punished by VCG.

> *I was at SAG two times a day, sometimes for the whole day, to set up action plans together, give ideas and suggest "let us try this or that". (VCG manager)*
> *VCG took much trouble and was very constructive. Every day, they said what had to be done to improve by the next day. The approach was not "what can be done better and do it", but rather "what can be done better and let us work on that together". […] VCG actively thought along, cooperated well, sat around the table and visited the work floor. (SAG manager)*

This mild reaction on the crisis at SAG was attributable to VCG's quality expectation pattern.

> *VCG allows many errors before the supplier has reached the desired quality level, but becomes exponentially stricter when that level is attained. Once the quality level surpasses VCG expectations, tolerance steeply lowers. So, the expectation pattern consists of two parts. The first one deals with a good supplier that once in a while does something wrong. The second one deals with a bad supplier that once in a while does something good. Expectations for both supplier types are very different. (SAG manager)*

Third, Mr Y got assistance from VCG, as well as the time to implement changes. The fact that VCG, in the person of Mr X, chose the new plant manager contributed to this collaborative approach, based on which both parties now freely visit each other. Such cooperation occurred less in 2004, because at that time SAG management did not know the people at VCG and the possibilities they offered to quickly come to a solution. In that respect, VCG also highlighted SAG how issues were dealt with by other JIS suppliers.

VCG brought in concrete knowledge, for example concerning [*] fixtures, by means of VCG employees coming over. Concerning quality, we got room to breathe. Also concerning IT, help was offered by workgroups. (SAG manager)
In case of problems, VCG collaborates with us. […] I have a badge that allows access to VCG 24-7. I can go everywhere I want, without having to ask for permission first. This also works the other way around. Mr X can come in at SAG, whenever he likes. […] That is the big advantage of Mr Y. He knows everybody, does some phone calls and that way easily enters the VCG organization. (SAG manager)
VCG proposed SAG to have a look at those [other JIS] suppliers and steal ideas with their eyes. That works and is primarily the merit of the supplier team, of which the most important goal is learning from each other. (VCG manager)

The former plant manager was not actively involved in the supplier team. Mr Y, however, was and engaged in being supplier team chairman. Furthermore, he also stimulated his middle level management to actively participate and contribute to the supplier team workgroups.

Already in April 2005, four months after Mr Y's appointment, SAG's operational performance had substantially improved, which even surprised VCG. Based on this fast performance recovery, VCG got confirmation of its high level of trust in Mr Y and regained trust in SAG. Because of that, VCG control was loosened. Yet, the change in the level of control and trust did not go gradually.

I did not expect Mr Y to set things straight that quickly, because the situation was extraordinary bad. (VCG manager)
By settings things straight and improving the PPM rate, we regained the customer's trust. (SAG manager)
I am of the opinion that once things are back under control, extra controls need to be reduced, for they are put in place to get out of the problematic situation. (VCG manager)
SAG and I succeeded in rendering VCG controls more informal again by consistently binding ourselves only to those promises we were certainly able to fulfil. People at VCG know that when I say "I will do this", I will really do it, and when it appears impossible to do, I will tell them. That way, formal control is less needed. […] It is not the case that VCG gradually exerts a bit less control and gradually has a bit more trust. The change rather goes via a turning point. The customer sets the supplier free, when he says what he is going to do, what will be the effects and when there will be any results. If the customer sees that the supplier worked correctly and attained the postulated results, the supplier may take a next step. The customer feels the progress and correct functioning of the supplier and then it can go quickly. Look at VCG's expectation pattern. Controls are built up slowly, but can be cut back very quickly. That is what happened at SAG. (SAG manager)

Indeed, after having spent nine months, more than officially allowed, in step four, VCG de-escalated SAG to step one in April 2005. Consequently, the supplier was not followed up on a daily basis any longer. That was an important change, because VCG experienced that a strictly formal relationship was difficult to work in.

VCG was specifying everything, concerning the how and the when, so that they were frustrated and more busy with capturing everything formally than searching for the right solutions. Taking on commitments very formally is difficult, because it requires much time and because it is very difficult to really make things non-negotiable. Therefore, I try to avoid that. (SAG manager)

As cooperation based on trust also has to work the other way around, VCG positively responded to Mr Y's trust in the automaker by keeping the relationship open and collaborative.

We also look at our own mistakes. […] Also the supplier has to dare to bring up problems, so that improvements can come from both sides. We are open for that and definitely do not only lay demands on the supplier, but also think about what we can do ourselves. (VCG manager)
Trust implies that when an error is discovered, both parties can talk about it in all openness. If VCG would assume that the supplier messes up, they would deny their own errors and that way inhibit trust building. (SAG manager)

Consequently, SAG openly communicates own operational difficulties to VCG.

I think it is typical of suppliers to keep the customer away from a problem and first try to solve it themselves. Yet, the only condition for this is that the supplier actually solves the problem. However, SAG now clearly works pro-actively. Problems are reported sooner, even if we are not sure whether VCG will suffer. (SAG manager)
If there is a machine breakage, we will immediately call VCG and report what is going on, which actions are being undertaken and when we are switching to safety stock. (SAG manager)

In other words, by sharing information and offering assistance in a trusting relationship, VCG succeeded in motivating SAG to respond similarly. Their choice for Mr Y perfectly fitted this approach. That is because trust needs to be built and Mr Y already worked with VCG for six years.

The person of the plant manager plays a big role in our relation with the supplier. This is played off through the supplier team, in which value is attached to the bond between VCG and plant managers and among plant managers. VCG has a part in that as well. It is giving and taking. We give suppliers a lot of information. That way, we want to stimulate suppliers to do the same, but one supplier responds more easily than another, largely because of the person of the plant manager. Mr Y's style is that way: communicating easily and calling informatively in beforehand. (VCG manager)
Mr Y recognizes problems and reports those to me and his own management. […] Being honest and not covering up problems works best. By working in beforehand, certain things can be taken into consideration. This approach is constantly promoted by VCG and me. […] That honest behaviour is the result of mutual trust, following from collaborating for years and talking about one thing and another. That way, you get to know how the other party works, how he thinks, so that you can anticipate on him. That approach works very well with Mr Y because of the long relation. He knows how I think and I also know that of him. He also knows that I am on the phone, the minute that something is wrong, and I also know that of him. That is an open relation that works fine. (VCG manager)

Nevertheless, the relationship clearly does not work on trust alone.

> *After the restructuring, extra controls, like third party inspection and an employee at the production line, were cut back. Yet, follow-up on PPM by the quality manager and line stops by the logistics manager was maintained as most important indicators to assess the supplier. (VCG manager)*
> *In the relationship with VCG, trust is the most important thing, yet linked to figures. […] We also see to having proof that can be used besides trust. After all, we can not work on trust alone. That is why we consistently take pictures of products leaving the facility. (SAG manager)*
> *The approach of VCG is finding a balance between a formal customer-supplier relation and an informal relation based on trust. This is a combination that works better than the mere formal approach. (VCG manager)*

In April 2006, SAG showed stable operational processes and high operational performance. The supplier even succeeded in producing two months without operational snags. SAG had installed a clear structure internally and externally, with which VCG was familiar, so that the manufacturer felt at home at the supplier. This evolution resulted in the recovery of all quality certificates lost, including the Q1 Award.

DISCUSSION

VCG-SAG case analysis

The aim of this study is to illustrate and refine the association between MCS fit and operational performance of a MSR, as visualised in the theoretical framework (cf figure 2.1). To that end, we bracketed the previously described case data into six time periods based on changes in the influencing variables, i.e. the level of contingencies, risks and the MCS. The substantial increase in the level of contingencies and risks demarcates periods 1 and 2, while different changes in the MCS demarcate periods 2 to 6. To facilitate within and between period comparisons of the different variables, the following analysis is organized by headings corresponding to the time periods. Consistent with the variance method, we interpret the case events in terms of the variables in the theoretical framework in order to compare the variables. Figure 2.2 shows a timeline that summarizes the results for each variable per time period from 2003 to 2006. Notice that performance is expressed in subjective and objective terms. The first performance measure results from assessing our qualitative data and indicates the periodical change (i.e. increasing or decreasing) of performance. This performance measure is added to summarize the case context and that way assist in interpreting the (objective) performance over time. The second performance measure refers to the average parts per million (PPM) over the period under consideration. The level of this quality measure is visualized by means of the graph at the bottom of the figure. The high-low categorization in

the tabular part of the figure results from comparing the average PPM with SAG's pre-defined target.

Insert Figure 2.2 About Here

Period 1 (January 2000 – December 2003)

From the start of production in 2000, SAG was an exemplary supplier with performance well above target. VCG's MCS appeared to fit the supplier's risks with basic KPI (primarily PPM) follow-up, a clear syllabus and a substantial level of competence trust, mainly based on previous good performance. VCG's goodwill trust, however, was low. On the one hand, SAG's start-up and production did not create large problems, for which open and honest communication combined with collaborative problem solving was needed. On the other hand, SAG's plant manager was completely unknown to VCG, as he was only sent on secondment from another Supplier Automotive facility and did not engage in STVC meetings. Because of limited interaction, VCG neither got the opportunity to share norms and values, nor establish personal relationships with SAG management, so that also social pressure possibilities were limited. Because nothing disturbed SAG delivery, VCG left the supplier alone.

Period 2 (January 2004 – June 2004)

In 2004, SAG started module delivery for two extra models, which considerably changed its relation with VCG. SAG production volume almost doubled, while production activities tripled. A considerable headcount increase and the introduction of night work further augmented process complexity. Besides task uncertainty, task interdependence heightened due to an explosion of model variants. As VCG built all four models on one assembly line, flexibility requirements became substantially more stringent. Furthermore, fluctuating demands for four Volvo models added to the need for more flexibility and the level of environmental uncertainty. This demand dependence followed the extended production capacity for two models of which commercial success was uncertain. This uncertainty put additional pressure on operational performance, especially regarding the first cars of which quality needed to be satisfactory in support of future market demand. Consequently, SAG's performance became even more important, so that the supplier was heavily inclined to keep operational difficulties in-house and solve snags itself. VCG's vulnerability towards this kind of opportunistic behaviour augmented. As SAG started to play a more important role in

VCG's supply chain, the automaker's striving for long term relational stability increased. Consequently, SAG's fear for retaliation, resulting from disclosed opportunism, reduced. In other words, the two extra models substantially changed situational characteristics and increased performance and relational risk of the VCG-SAG relationship. Following the theoretical model, VCG must raise the level of management control to preserve a MCS fitting the increased level of risks and positively impacting performance.

However, neither formal nor informal controls were considerably heightened. With respect to formal controls, VCG did set up cross-functional workgroups during the project phase, but these only focused on the supplier interface and did not control all supplier processes. In addition, VCG got deceived by SAG's information provision and approved an operational plan instead of reality. Consequently, SAG was in a position to handle operational changes too lax and to neglect adequately communicating them in the organization. Moreover, VCG considered SAG to be manageable by a less experienced quality engineer. These formal control decisions followed VCG's competence trust in SAG, primarily based on previous good performance. However, VCG did not receive any signals that SAG would really be able to effectively handle heightened supply requirements. For example, VCG neither got the impression that Supplier Automotive had worked hard to prepare SAG, nor received information about an extra production or quality engineer to ensure production quality. Thus, the automaker had no grounds to build additional competence trust in justification of lower project workgroup thoroughness and the appointment of a young quality engineer. VCG's goodwill trust and social pressure possibilities on SAG were not heightened either and remained low. Hence, while risks considerably augmented, VCG's MCS did not follow this change[18] and evolved from contingency fit into misfit. Provided that SAG was incapable of dealing with the changes, we expect this situation to aggravate SAG's operational performance, which is exactly what happened. After the start of production, SAG struggled, appeared unable to fulfil agreements made during the project phase and seriously damaged VCG's competence trust.

[18] Nevertheless, VCG did put SAG in step two of the escalating activities procedure. Yet, this escalation is standard procedure in case of a new car model launch. After the start of production, it depends on the supplier's performance to determine the next step.

Period 3 (July 2004 – August 2004)

VCG responded by escalating the supplier in the escalating activities procedure and installing extra outcome controls, like third party inspection and taking a picture of every module. Furthermore, behaviour control sharpened by daily supplier company visits of a VCC/VCG team led by a VCG expert (Mr X). This team aimed at collaboratively solving snags during supplier review meetings. Nevertheless, VCG's collaboration was hampered by SAG's opportunistic behaviour. Instead of responding openly and honestly to VCG concerns and accepting the assistance offered, SAG management initially kept VCG staff away from the issues. By continuously telling problems were taken care of, while in reality multiple issues remained, the plant manager further damaged goodwill trust. Moreover, SAG's poor performance made it clear that the supplier already deceived VCG during the project phase by distorting information. This deception carried on, until VCG escalated the supplier to step four and installed outcome and behaviour controls to monitor every detail of SAG's output and operational process. Those controls proved VCG's remaining competence trust undeserved, as SAG was unable to improve. Instead, all middle level managers quit, leaving the plant manager to handle the situation alone. Finally, this manager also lost VCG's contractual trust by continuing to promise solutions, while in reality VCG kept suffering.

Period 4 (September 2004 – December 2004)

At that time, Mr X no longer tolerated SAG's low profile and demanded active involvement from Supplier Automotive. As a result, SAG got a new interim plant manager from another facility and operational assistance. That way, VCG tried to reinstall a sufficient level of trust in SAG, because as long as the level of informal control did not fit the heightened risks, the framework predicted operational difficulties to remain. As the first plant manager was replaced by a new interim plant manager, who received mother company assistance and initial VCG trust, performance was expected to pick up. Besides heightened informal control, the extra outcome controls and daily supplier visits were retained to contribute to the renewed MCS fit. Nevertheless, the new plant manager was unknown to VCG, so that his starting level of trust, based on previous interaction and reputation, was minimal. In addition, he only became interim manager, rendering social pressure based on negative personal feelings unsuited as control instrument. Moreover, the fact that he only became interim plant manager reflected that he did not like being detached to SAG. In other words, VCG only restated little trust in SAG, based on which both parties would have to work together. Hence, the informal control level did not sufficiently fit the increased level of risks, so that continuing operational difficulties could be foreseen.

Indeed, despite improved VCG access to SAG's shop floor, SAG's performance never was poorer. Especially the interim plant manager turned out to prefer addressing symptoms with technical solutions instead of investigating causes together with VCG. This even worsened certain operational issues. Consequently, also this plant manager quickly lost VCG's trust and left, leaving the VCG-SAG relation astray once again.

Period 5 (January 2005 – March 2005)

However this time, Mr X acted differently by choosing and promoting a plant manager himself, in particular Mr Y, who VCG knew very well. Because of his outstanding relationship with VCG, he started with high levels of trust and VCG back-up in putting pressure on Supplier Automotive. In addition, his managing attitude fitted VCG's goal of tackling problem causes instead of symptoms in an open and collaborative way. In terms of management controls, VCG increased the level of trust and social pressure by installing a plant manager in which the starting levels of these controls would be sufficiently high to fit the MSR's risks. First, VCG reinstalled contractual trust, because the manufacturer was confident Mr Y would not make promises that he could not keep. Second, VCG knew he would openly communicate problems, prohibiting him from keeping promises made, because he had never acted opportunistically before. Third, VCG was familiar with Mr Y's management style and desire to look for problem causes, which contributed to their competence trust. Although he had to prove this type of trust during the first period of his appointment, joint problem solving was a genuine issue with previous plant managers, contributing to the inability to create a turnaround. Fourth, Mr Y was more aware of SAG's impact on VCG production and more familiar with VCG norms and values than previous plant managers. Many years of experience, a personal relationship with VCG managers (e.g. Mr X) and a good reputation made Mr Y sensitive towards social pressure. Moreover, the STVC now played a role of importance as well. Previously, the STVC did not informally control SAG's plant managers. The first one was only sent on secondment and did not engage in STVC meetings, while the second one was too occupied trying to restructure SAG and not interested due to his temporary statute. Mr Y, however, already consistently participated in overall STVC meetings and chaired the IT workgroup. Later, this engagement even increased, when he accepted the role of STVC chairman. That way, the STVC contributed to VCG's trust in Mr Y, and vice versa, and increased social pressure of both VCG and other JIS suppliers, to whom the STVC made Mr Y feel largely responsible. These heightened informal controls fitted the high risks for the first time and formed the reason to deliberately choose Mr Y. Hence, the framework predicted performance to improve, which it rapidly did. Within

months of Mr Y's appointment and much quicker than anyone could have imagined, SAG realised a considerable turnaround.

Period 6 (April 2005 – …)

Consequently, VCG rapidly cut back formal controls. In fact, SAG was already de-escalated to step one of the escalating activities procedure one month after Mr Y actually started. In other words, VCG lowered all extra formal controls from the moment SAG showed substantial improvements, building sufficient competence trust. Hence, formal controls were put back to basic supplier controls resembling the period 2000-2003; yet slightly extended, as VCG continued registering line stop minutes (i.e. number of minutes that a supplier causes stoppage of the VCG assembly line) and dropped cars (i.e. number of cars dropped from VCG's line planning, because a supplier is unable to deliver the requested part), reiterated the penalty system and kept supplier outcome and behaviour follow-up more frequent due to the new production environment. The level of informal control, however, was many times higher, with high levels of trust building and social pressure. As VCG used this combined MCS to govern risks in the new production situation, SAG regained its outstanding performance already one year later. This good result was reflected in the awarding of lost certificates like the Q1 Award.

Dynamics of the fit-performance association

The within period comparisons of the degree of fit and level of performance in previous case analysis provide considerable evidence of the *static* association between degree of fit and operational performance. In 2004, SAG struggled after starting module production and delivery for two new extra Volvo models. As VCG's MCS no longer fitted SAG's heightened risks, the MCS aggravated performance, so that operational difficulties seriously escalated. As a result, VCG changed the MCS design towards a design fitting the level of risks. Supported by the new contingency fit, operational performance rapidly picked up. Therefore, we conclude that this case effectively illustrates our static proposition concerning the fit-performance assumption, underlying previous inter-organizational MCS studies like Dekker (2004). That way, we support earlier findings of Ittner et al. (1999) and Anderson & Dekker (2005), stipulating that a MCS fit on situational characteristics benefits performance.

Nevertheless, the between period comparisons of our longitudinal data refine their findings with respect to the *dynamics* of the fit-performance association. Operational difficulties *followed* a MCS misfit resulting from changed contingencies, while operational improvements *only* set in *when* the MCS fitted the new situation. Furthermore, the evolution

from MCS misfit to MCS fit did *not* occur *immediately*. It took VCG several attempts to achieve the appropriate level of management control. Clearly, only investigating the MCS, its influencing contingencies and performance in periods one and six would not deliver these results. The longitudinal data on several periods provide evidence on the actual dynamics behind the fit-performance association, which offer the following interesting insights.

First, the case shows the importance of informal management control in governing MSRs. Although MSRs are more formal than procurement and R&D relations previously studied (e.g. Cooper & Slagmulder, 2004; Dekker, 2004; Kajüter & Kulmala, 2005), we find that VCG's SAG MCS consists of a combination of formal and informal controls, of which the informal trust building and social pressure play an important role. Without these informal controls fitting the MSR's risks, SAG's operational performance did not improve. If informal controls were unnecessary, VCG's increased level of formal controls should have been able to deal with the operational snags, as they were increased to fit the heightened risks and worked properly. More specifically, the extra formal controls effectively detected poor SAG performance with respect to product quality and operational processes. Yet, these controls appeared unable to overcome the operational difficulties, given the absence of sufficient trust building and social pressure possibilities. This informal control appeared to be needed to create a turnaround. By choosing Mr Y as new plant manager, the VCG-SAG relation instantly regained high trust and lots of social pressure. Both parties agree that without this reinstatement of high informal control, performance would not have picked up; or at least not that quickly.[19]

Second, the case shows the impact of interacting managers and their personal relation on performance, and the way in which VCG used this awareness to its benefit. When the contingencies changed, the VCG-SAG relation was managed by a young inexperienced VCG engineer and an unsuitable SAG plant manager. The VCG engineer barely knew SAG managers and had little experience with handling operational problems. The plant manager did not respond to VCG's open collaborative approach to search for problem causes and showed little involvement.

[19] Another reason for the amelioration of the SAG supply might have been the learning curve. After struggling to manufacture and deliver a new type of module for more than one year, SAG might finally have learned enough about its new production environment, at the time Mr Y took over. Our data indicate that such learning effects definitely played a role in coping with start-up issues and improving performance at all VCG suppliers. Nevertheless, both VCG and SAG managers confirm that SAG suffered bigger problems for a longer period of time than similar high value-added just-in-sequence suppliers. Moreover, all interviewees agree that without the appointment of Mr Y, these difficulties would have disturbed SAG supply much longer.

To revive operational performance, both men were replaced; the first one by Mr X and the second one by Mr Y. Only from that point in time, interacting managers shared a well established personal relation, so that informal controls were sufficiently high to effectively cope with the increased risks. In addition, the case shows specific ways in which the manufacturer informally controls these relations. First, VCG utilizes trust building mechanisms, like assisting suppliers with difficulties to build competence trust and continuously sharing VCG norms and values to build goodwill trust. Second, the STVC aims at building trust by means of one common goal for all JIS suppliers, joint decision taking and joint problem solving. In addition, severe operational snags are reported on the STVC, so that social pressure is extended to all JIS suppliers possibly affected by the snag. Yet, to be susceptible to social pressure, the plant manager must be sufficiently involved with VCG and the STVC. At SAG, this had never been the case, so that VCG managers took the opportunity to choose a plant manager themselves. That way, VCG management displayed a remarkable third way of building personal relations, namely *actively and deliberately* influencing supplier decision making to install a plant manger of their choice. With Mr Y, VCG chose a manager with many years of experience and STVC involvement, who provided a good starting relation with instantly high trust that only grew during his restructuring. This leap of trust shows that trust not always has to be built up gradually. In addition, Mr Y was susceptible to social pressure because of his personal relation with VCG managers, good reputation and active involvement in the STVC. That way, our sequence analysis of the events contradicts that all credit for the successful revival of SAG was attributable to Mr Y. Instead, we conclude that VCG created an adequate environment for the turnaround by specifically choosing Mr Y and instantly installing an informal control level that fitted the new situation. That way, this important change in the MCS substantially contributed to SAG's performance resurrection.

Third, the case reveals that VCG's reliance on informal controls, in particular trust building, also has a down side. Because of the competence trust, VCG was surprised when severe performance problems arose. Consequently, the manufacturer lost time by responding slowly in building up extra formal controls and collaboratively working on counter measures. Yet, this gradual formal control increase is standard procedure, structured via the escalating activities procedure. In that respect, VCG actually responded relatively fast by immediately escalating the supplier to step four. Also Mr X was quickly assigned to SAG. Still, VCG lost valuable time because of the informal controls. In particular, VCG managers were not sufficiently aware of the fact that they needed to heighten informal control to fit the high risks by *reinstalling* sufficient trust and *installing* social pressure. Despite VCG emphasising the

reliance on personal relations and informal control, they ignored this part of their MCS during SAG's problem escalation. Consequently, they needed two unsuccessful attempts, before they effectively increased informal control on SAG via its plant manager. Therefore, this case demonstrates that reliance on informal control requires the manufacturer to be well aware of its use, especially in times of important changes. Otherwise, the importance of increasing informal control will be underestimated, either when contingencies drastically heighten risks or when the supplier damages trust by making errors or acting opportunistically. Furthermore, this awareness needs to be present at all levels of VCG and SAG management interacting with each other. Only that way, informal control, especially trust, will not result in time losses when difficulties arise.

Dynamic relation between trust and formal control

Our longitudinal case data offer the possibility to make another important contribution, regarding the dynamic relation between trust and formal control, on which further research has been called for (Anderson & Dekker, 2005; van der Meer-Kooistra & Vosselman, 2006). In particular, the question is whether trust and formal control are complements or substitutes. The complementary relation renders trust and formal controls additively related, which means that any increase of trust or formal control raises the level of management control (Dekker, 2004). This way, more formal controls ameliorate trust, both by lowering the level of risk (Poppo & Zenger, 2002) and by creating an objective framework for assessing each party's performance and behaviour (Das & Teng, 1998). Contrary, the substitutive relationship implies that trust and formal control are inversely related, so that more trust is associated with less formal control and vice versa (Dekker, 2004). In this view, more trust reduces risk, which subsequently decreases the need for formal control (Chiles & McMackin, 1996). Moreover, formal control signals a lack of trust and subsequently deteriorates trust (Das & Teng, 1998). As it is argued that the ambiguity concerning both views relates to relation dynamics (Van den Abbeele, 2006), we believe longitudinal data are most suited to shed more light on this relation. As VCG's SAG MCS contains both formal control and trust building techniques, of which trust is the outcome, this MSR offers the possibility to effectively study their relation.

The case findings indicate that the relation is complementary and substitutive at the same time, depending on the level of formal control. In particular, trust and basic formal control act as complements. Basic formal control refers to VCG's continuous outcome and behaviour control, like monitoring PPM rate and visiting suppliers on a regular basis, irrespective of the level of trust in the supplier or the supplier's operational performance.

It is the type of formal control that is exercised under all circumstances. Evidence on the complementary relation of basic formal control and trust follows from VCG's MCS, which contains both control types to govern SAG in periods of good performance. Both VCG and SAG indicate that controlling the MSR is impossible with either only formal control or trust. Moreover, the basic formal control contributes to building competence and goodwill trust by making good operational performance more transparent and allowing operational snags to be handled collaboratively in all openness. Yet at the same time, trust substitutes for extra formal controls, which are set up on top of basic formal control. Evidence of this relation, however, only results from analyzing the performance decrease. Indeed, only studying MCS dynamics in the period 2004-2005 visualizes that when VCG's trust in SAG deteriorated, extra formal controls were put in place on top of basic formal control. Oppositely, regained trust made VCG loosen formal control by cutting back extra control and falling back on basic control only.

Yet, the timing of lowering extra formal control substantially differed from the building up. In particular, VCG built up extra formal control gradually and stepwise via the escalating activities procedure. When SAG's performance did not improve after a few months, the supplier was escalated to a next step and subjected to more formal control. Opposite to this stepwise increase, the lowering of extra formal controls took place immediately, as SAG was reset to step one once trust sufficiently heightened. When trust reached the threshold level again, due to promises kept, improving performance and supplier openness, all extra formal controls were quickly lowered; at least much quicker than their stepwise increase. The reason for this substitutive relation is clear. Trust is much cheaper than extra formal control in transaction cost terms (Dekker, 2004); at least in this case, in which it is instantly created via Mr Y. Based on trust, VCG and SAG can work together without relying on extra formalisation both in daily operational interaction and in problem situations. Especially in case of solving single operational snags, trust helps by leaving out formal investigations regarding problem responsibility. Instead, VCG and SAG are confident each party openly communicates, does everything in its power to solve the problem and actually succeeds; a conviction encompassing all three types of trust.

Thus, contrary to previous studies, we find formal controls and trust to be complements (e.g. Poppo & Zenger, 2002) *and* substitutes (e.g. Chiles & McMackin, 1996) at the same time. This finding seems to correspond to Klein Woolthuis et al. (2005), who argue that trust and formal control, in particular contracts, can be both complements and substitutes, "depending on the intentions with which contracts are drawn up and used" (Klein Woolthuis et al., 2005, p. 834). In particular, these authors find contracts either extensively emphasizing safeguarding clauses to protect partners or clearly specifying goals to coordinate the IOR. Yet, while Klein Woolthuis et al. (2005) find different relations between trust and formal control in different IORs, we find trust and formal control to be both complements and substitutes within the same IOR, similar to Dekker (2004) and Van den Abbeele (2006). Indeed, Dekker (2004) suggests that formal control is complementary and beneficial to trust, until a certain threshold of formal control is reached. When the formal control level is sufficiently high to govern the IOR, trust substitutes formal control (Dekker, 2004). Also Van den Abbeele's (2006) survey data regarding IT sourcing shows a complementary relation in the early stages of the IOR and a substitutive one in the later stages.

Nevertheless, by finding both relations at the same time, we refine the findings of Dekker (2004) and Van den Abbeele (2006). It must be clear that our case concerns one of the later stages of the MSR, namely the manufacturing phase. In this phase, however, trust and formal control are not only substitutes, but also complements. In particular, the substitutive relation regards extra formal controls, which are only installed above a threshold of basic formal controls, when trust deteriorates below its threshold. These basic formal controls complement trust at all times and forms a necessary flank to support an efficient build-up and functioning of trust, while at the same time the presence of trust reduces the need for extra formal control (cf van der Meer-Kooistra & Vosselman, 2004). The latter conclusion follows from the absence of extra formal controls when trust is high, and the lowering of extra formal control when trust is built up. Obviously, providing such findings was only possible by means of the longitudinal data, which offered a great opportunity to shed more light on MCS dynamics. That way, our findings support that the complementary-substitutive ambiguity in earlier studies might be the result of neglecting these dynamics (Van den Abbeele, 2006).

CONCLUSION

This paper contributes to the inter-organizational management control literature by studying the association between appropriate MCS design (i.e. a MCS fitting the MSR's level of contingencies and risks) and performance. Although MCSs are found to be contingent in several types of IORs, this research field has not sufficiently addressed the association with performance, which is most important in contingency theory assuming a contingency approach to fit instead of a congruence approach. Although some studies provide theoretical models incorporating the fit-performance association (e.g. Kajüter & Kulmala, 2005), most research only assumes this association to hold (Kamminga & van der Meer-Kooistra, 2007). To our knowledge, only Ittner et al. (1999) and Anderson & Dekker (2005) study the impact of a contingency fitted MCS on performance. Yet, these papers indicate two limitations following their *survey* research, namely the limited scope of the MCS and the study of average practice only. As a result, a *case* study is proposed to be a more powerful tool to investigate the impact of MCS fit on performance (Ittner et al., 1999; Dekker, 2004).

To illustrate the validity and refine the dynamics of this association in practice, we studied a supplier relation in the manufacturing phase of the supply chain, which is relatively under-explored in the inter-organizational management control literature (Cooper & Slagmulder, 2004; Langfield-Smith & Smith, 2003; Scannell et al., 2000). In particular, we looked at the relation between a Volvo Cars facility (VCG) and a high value-added just-in-sequence module supplier facility (SAG) in the automotive industry, which is characterized by competitive pressure and continuous improvement (Carr & Ng, 1995). To that end, we refined existing management control theory for MSRs by proposing a theoretical contingency framework from the position of the manufacturer, which includes the dynamic association between degree of MCS fit on contingencies and risks, and operational performance. The real contribution of our case study follows from its longitudinal design, because this design allowed effectively exploring the impact of fit on performance in the course of time by the sequence of events and to refine current understanding of the fit-performance association. For that reason, we focus our attention on a changing MSR with fluctuating performance. The theoretical proposition is that if a supplier is incapable of dealing with changed contingencies, a misfitted MCS *temporarily* aggravates performance, *until* the MCS is *changed* towards a design fitting the changed contingencies and risks and therefore contributing to performance (Kamminga & van der Meer-Kooistra, 2007; van Veen-Dirks, 2006).

Our longitudinal data, which are structured and interpreted by means of the temporal bracketing and variance methods (Rowe et al., 2008), provide substantial evidence supporting this proposition. In 2004, SAG struggled to perform after starting module production and delivery for two new extra Volvo models. As VCG's MCS no longer fitted SAG's heightened risks and operational difficulties seriously escalated, VCG changed the MCS towards a design fitting the level of risks, which contributed to the revival of operational performance. That way, our case confirms and refines previous findings of Ittner et al. (1999) and Anderson & Dekker (2005). Furthermore, our case demonstrates the importance of informal control on supplier management, as formal controls appeared unable to overcome operational difficulties and a turnaround only set in when informal controls were sufficiently installed. In that respect, the case also shows the active role of VCG in establishing trust building and social pressure by choosing a suitable SAG plant manager. VCG became aware of the impact of interacting managers and their personal relation on performance and used this awareness to its benefit. Especially the creation of a leap of trust, which shows that trust not always has to be built up gradually, marks VCG's approach in that respect. Nevertheless, the case reveals that high reliance on informal controls, in particular trust building, also has a down side. When trust decreases, time can be lost by responding slowly in building up extra formal controls and collaboratively working on reinstalling sufficient trust. Hence, relying on informal controls requires the manufacturer to be well aware of its use. Otherwise, the importance of increasing informal control will be underestimated in case of heightened risks or damaged trust.

An additional contribution of this paper concerns the dynamic relation between formal control and trust. Our longitudinal data suggest that formal control and trust are complements and substitutes at the same time, depending on the level of formal control. In particular, trust and basic formal control are complements, while trust and extra formal control are substitutes. In the VCG-SAG case, this relation becomes visible by means of the MCS and the escalating activities procedure adding extra controls to the MCS. Compared to prior research, this result contradicts earlier findings of Chiles & McMackin (1996) (substitutes), Poppo & Zenger (2002) (complements) and Klein Woolthuis et al. (2005) (either complements or substitutes, but not in one IOR). In addition, our result refines the findings of Dekker (2004) and Van den Abbeele (2006) by showing that trust and formal control are both complements and substitutes in one IOR at the same time of the relation life cycle. Furthermore, our data indicate a timing difference in the substitutive relation. The building up of extra formal control proceeds gradually, while the lowering happens almost immediately.

That way, our findings support that the complementary-substitutive ambiguity in the literature might be the result of earlier studies neglecting MCS dynamics (Van den Abbeele, 2006).

A final contribution of this paper lies in its specific focus on a changing MSR with fluctuating performance, contrary to the current literature, which seems to under-value in-depth research into poor performance by primarily studying success instead of failure. Obviously, we can learn a lot from studying good performance, but we believe we can learn even more from looking into operational difficulties. Nevertheless, we acknowledge the issue seriously hampering this kind of research, namely finding access to study operational difficulties and obtaining permission to publish the results (Kamminga & van der Meer-Kooistra, 2007). Naturally, there exist some ways to overcome these difficulties, such as researching rather old cases, exclusively relying on second hand data and disguising company names, so that confidentiality becomes less of an issue (cf Klein Woolthuis et al., 2005). Yet, that kind of data reduces a study's internal validity. Therefore, first hand data of a more recent IOR, not requiring full company disguising, are still preferable. Due to VCG's openness and desire to learn, and our emphasis on research ethics and confidentiality, we were able to gather that kind of data for this paper.

Although the case study method was specifically chosen for its methodological qualities for studying the dynamics of an extensive MCS, we acknowledge that studying only one MSR hampers generalizing our findings. For example, we have no idea to what extent manufactures without a supplier team, which provides the opportunity to build personal relations with supplier managers, are able to choose supplier managers to their advantage. Similarly, we do not exactly know to what extent the learning curve impacted the turnaround of SAG performance or to what extent the prior supply chain phases of procurement and R&D impact the VCG-SAG relation during manufacturing. Yet, these limitations immediately offer a first avenue for future research, which could compare our findings to other MSRs between other companies, both in the automotive industry and others like consumer electronics. Especially the role of informal controls and personal relations between interacting managers are worth further study.

A second avenue for further research might be to design a real-time longitudinal case study, instead of a retrospective case like in this paper. Although finding access to study contingency changes, MCS dynamics and potential operational difficulties at the moment of occurrence will probably be a big challenge, the advantage is clear. Real-time data, especially from interviews, are more accurate. Although our study's data came from both VCG and

supplier managers, and were triangulated with performance data, we admit that managers' opinions on events were probably biased two years after the events occurred. Moreover, the retrospective research design prohibited us from interviewing the initial SAG managers, so that their perceptions on the events were not available. A real-time study could cope with these limitations.

A third avenue for future research could investigate factors that contribute to the speed of MCS change, so that temporary misfits due to changing circumstances are less likely to occur (van Veen-Dirks, 2006). For example, our study demonstrated the contribution of SAG's mother company on the escalation of operational difficulties. Because Supplier Automotive used a low profile approach, SAG received too little support both during the project phase and during the gradual escalation of performance. Only when VCG demanded active involvement, the mother company took action and offered assistance. Consequently, we could assume that a more involved mother company would benefit the fit between MCS and risks and that way also operational performance. Besides supplier culture, relationship length is another unaddressed variable, possibly positively influencing MCS fit. As both resembling organizational culture and relationship length are already proposed to be influential in outsourcing decisions (van der Meer-Kooistra & Vosselman, 2000) and strategic alliances (Dekker, 2004), a study comparing different MSRs could shed more light on the influence of these factors.

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FIGURE 2.1

Theoretical contingency framework for MCS design and the impact on operational performance of MSRs

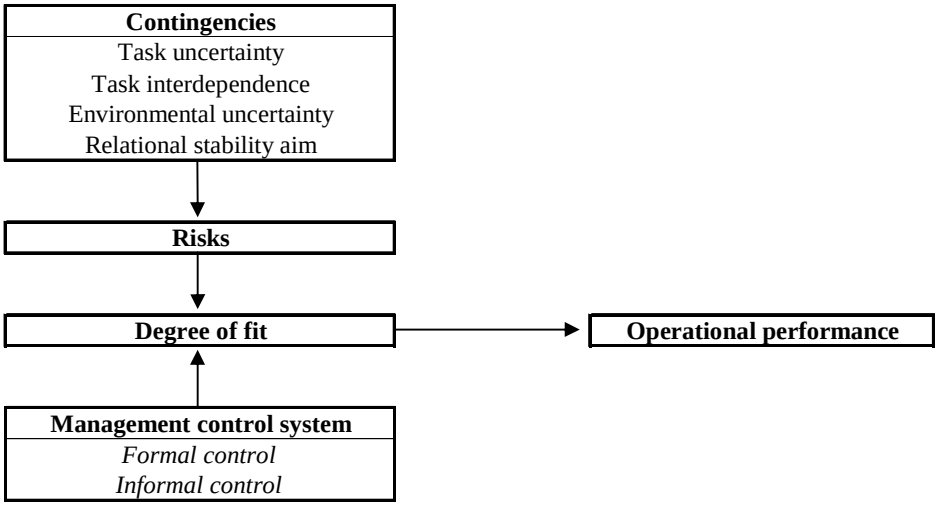

TABLE 2.1

Interview data summary

Organization	Interviewee	Number of interviews	Duration (in min.)	Date
VCG	Engineering Director & Material Planning & Logistics Manager	1 (joint)	122	8/02/2006
	Supply Chain Control & Coordination Manager	2	55; 62	10/02/2006; 29/05/2006
	Logistic Engineering Manager	1	68	10/02/2006
	Supplier Support & Purchasing Manager	2	92; 95	15/02/2006; 18/04/2006
	Material Planning Manager	1	73	15/02/2006
	Supplier Quality Assurance Manager	2	44; 96	15/02/2006; 29/05/2006
	Human Resource Manager	1	50	15/02/2006
	Finance Manager	1	47	15/02/2006
	IT Manager	1	67	13/03/2006
SAG	Plant Manager	2	106; 74	13/03/2006; 18/04/2006
	Human Resource Manager	1	51	29/03/2006
	Quality Manager	2	125; 121	29/03/2006; 18/07/2007

FIGURE 2.2

VCG-SAG MCS fit and operational performance over time