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Management control system design for supplier relationships in manufacturing:
Case study evidence from the automotive industry

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To Elien, my wife to be

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Table of contents

Acknowledgements

Table of contents

General introduction 1

1. Research motivation 1

2. Theoretical background 4

2.1. Management control system design 4

2.2. Contingency theory 7

3. Overview of manuscripts and theoretical framework 9

3.1. Manuscript 1 11

3.2. Manuscript 2 12

3.3. Manuscript 3 14

4. Research methodology 15

4.1. Case study research 15

4.2. Case company selection 18

4.2.1. Automotive industry 18

4.2.2. Volvo Cars Gent 19

4.2.3. VCG suppliers 21

4.2.4. VCG case company description 21

4.3. Data collection 23

4.4. Data analysis 25

Manuscript 1 - Management control of supplier relationships in manufacturing: A case study in the automotive industry 27

Abstract 27

1. Introduction 28

2. Theoretical framework 32

2.1. Performance risk 33

2.2. Relational risk 34

2.3. Management control system 36

3. Research methodology 38

3.1. Case study research 38

3.2. Case company selection 39
3.3. Data collection 40
3.4. Data analysis 42
4. Case study: Volvo Cars Gent 43
4.1. Case company description 43
4.2. Management control system of supplier relationships 44
4.2.1. Risks 46
4.2.2. Contingencies 46
4.2.3. Management control system 52
5. Discussion 65
6. Conclusion 68
Appendix: Interview protocol 71
Manuscript 2 - The impact of inter-organizational management control systems on performance: A longitudinal case study of a supplier relation in automotive 73
Abstract 73
1. Introduction 74
2. Literature study 76
3. Theoretical framework and research propositions 80
4. Research methodology 84
4.1. Case study research 84
4.2. Case company selection 85
4.3. Data collection 86
4.4. Data analysis 88
5. Case study description: the fall and revival of an exemplary MSR 89
6. Discussion 101
6.1. VCG-SAG case analysis 101
6.2. Dynamics of the fit-performance association 107
6.3. Dynamic relation between trust and formal control 110
7. Conclusion 113
Manuscript 3 - The impact of cultural resemblance on management control of supplier relations: Longitudinal evidence in the automotive industry 117
Abstract 117
1. Introduction 118

2. Literature study 120
3. Theoretical framework and research proposition 124
4. Research methodology 131
4.1. Case study research 131
4.2. Case company selection 132
4.3. Data collection 133
4.4. Data analysis 136
5. Case study 141
5.1. Volvo Cars Gent 141
5.2. Module suppliers SAG1 and SAG2 145
5.3. Contingency changes 146
5.4. Case analysis of relation dynamics 147
5.4.1. SAG1 150
5.4.2. SAG2 153
6. Discussion 157
7. Conclusion 162
General conclusion 168
1. Contributions to the academic literature 168
1.1. Illustrating MCS design for MSRs 169
1.2. Explaining MCS design for MSRs 170
1.3. Research methodology 175
2. Implications for business practice 176
3. Suggestions for future research 179
List of tables 185
List of figures 186
References 187
Doctoral dissertations from the Faculty of Business and Economics 199

General introduction

The goal of this doctoral dissertation is to contribute to the unravelling of management control system (MCS) design for supplier relationships in the relatively under-explored manufacturing phase of the supply chain. To that end, this dissertation contains three manuscripts describing, comparing and analyzing MCS design based on the latest inter-organizational management control theory. More specifically, the first manuscript studies how the MCS of manufacturer-supplier relations is designed, how important informal controls are in that design and whether the MCS design fits situational contingencies. The second manuscript investigates whether this MCS contingency fit is associated with operational performance by specifically focusing on MCS dynamics over time. Finally, the third manuscript looks into the role of resembling organizational culture in contributing to the speed of MCS change, so that temporary MCS misfits due to changing circumstances are less likely to occur. Although every manuscript has its own research design, all manuscripts' empirics result from an in-depth explanatory case study. In particular, we studied MCS design for supplier relationships of the automotive manufacturer Volvo Cars Gent, which outsourced many manufacturing activities and therefore has numerous suppliers to control.

The aim of this general introduction is to give an overview of the research in this doctoral dissertation and provide the necessary theoretical and methodological background. To that end, the remainder of this introduction is organised as follows. In the first section, we position and motivate our research in the inter-organizational management control literature. The second section presents the theoretical background, concerning our conceptualization of MCS design and our contingency theory lens to study this design. Third, we present our theoretical framework, which will be studied in practice, and explain how the research questions of the three manuscripts are connected and related to this framework. Finally, the fourth section describes the case research methodology for the three manuscripts.

1. Research motivation

The current economic environment demands an effective supply chain, when companies strive for sustainable competitive advantage. Due to globalisation, deregulation, enhanced levels of competition, empowerment of customers and the diffusion of new technologies,

many organizations acknowledge the difficulties of developing and maintaining the range of expertise necessary to compete successfully (Gulati, 1995; Kulmala et al., 2002; Langfield-Smith & Smith, 2003; Nixon & Burns, 2005; van der Meer-Kooistra & Vosselman, 2006). However, there exist various forms of inter-organizational cooperation, like outsourcing activities to suppliers, which provide access to the needed specialised skills (Das & Teng, 2001). Not surprisingly, numerous studies show that inter-organizational relationships (IORs) have a high potential impact on the organization's performance (e.g. Anderson & Dekker, 2005; Dyer & Singh, 1998; Elmuti, 2002; Groves & Valsamakis, 1998; Harrison & New, 2002; Ittner et al., 1999; Timme & Williams-Timme, 2000; Trent & Monczka, 2002).

In spite of that, the literature also argues that a lot of IORs do not provide the expected benefits and are often broken up because of management difficulties (Ireland et al., 2002). For example, the failure rate of alliances appears significantly higher than that of a single firm (Das & Teng, 2000). Besides goal divergence (Ireland et al., 2002), academics often propose lack of coordination and opportunistic behaviour of partners as the two main reasons for this relatively high failure rate (e.g. Das & Teng, 1998; Gulati & Singh, 1998; Dekker, 2004). Therefore, the governance structure of an IOR is argued to be critical for its success (Ittner et al., 1999). Effective governance even appears to be a source of inter-organizational competitive advantage (Ireland et al., 2002). Hence, control systems might play a crucial role in relationship management and the prevention of failure by establishing governance mechanisms to monitor and control the relationship to the benefit of all parties (Hutt et al., 2000).

Nevertheless, the management control literature traditionally focused on controls of one firm within the supply chain (e.g. Degraeve & Roodhooft, 2001). Indeed, despite being an indispensable part of business relationships, inter-organizational MCSs only recently received substantial interest in the literature (Dekker, 2003). Not until the mid-nineties, scholars started calling for more attention towards this topic (e.g. Hopwood, 1996; Munday, 1992; Otley, 1994; Scapens & Bromwich, 2001), but they have not stopped since (e.g. van der Meer-Kooistra & Vosselman, 2006). As a result, the role of inter-organizational MCSs has recently been studied from several angles, including outsourcing relations (e.g. Anderson et al., 2000; Donada & Nogatchewsky, 2006; Gietzmann, 1996; Langfield-Smith & Smith, 2003; Mouritsen et al., 2001; Nicholson et al., 2006; Sartorius & Kirsten, 2005; van der Meer-Kooistra & Vosselman, 2000), inter-organizational cost

management relations (e.g. Carr & Ng, 1995; Cooper & Slagmulder, 1999; Cooper & Slagmulder, 2004), partnerships (e.g. Christopher & Jüttner, 2000; Scannell, Vickery & Dröge, 2000; Seal et al., 1999; Seal et al., 2004), strategic alliances (e.g. Birnberg, 1998; Dekker 2004; Gulati, 1995; Gulati & Singh, 1998; Tomkins, 2001), networks (e.g. Hakansson & Lind, 2004; Kajüter & Kulmala, 2005; Kulmala et al., 2002; Mouritsen & Thrane, 2006) and joint ventures (e.g. Chalos & O'Connor, 2004; Kamminga & van der Meer-Kooistra, 2007).

Yet, the main emphasis lied on relational collaboration during the procurement and R&D phases of the supply chain (e.g. Cooper & Slagmulder 2004; Dekker 2004; Gietzmann, 1996; Mouritsen et al., 2001). This historical focus is justified for three reasons. First, it is widely accepted that up to 80% of the product costs are committed during the product and process planning and design phase, implying that a lot of cost reductions can be achieved during that phase (Cooper & Kaplan, 1999). Second, the common use of target costing in case of outsourced design (Mouritsen et al., 2001) reinforces the trend towards cost reductions in this supply chain phase by imposing a maximum allowable cost price from the start. Third, research shows that extensive collaboration with suppliers is very effective in reducing the buyer's R&D costs to up to 15% (Cooper & Slagmulder, 2004). Especially automakers use suppliers to accelerate and rationalize the development process (Ittner et al., 1999).

MCSs in other supply chain phases, however, remain relatively under-explored. For example, Cooper & Slagmulder (2004) suggest studying other forms of company interaction, besides procurement and R&D, that trigger inter-organizational cost management. Manufacturing is such a supply chain phase, of which further study is justified (Cooper & Slagmulder, 2004; Langfield-Smith & Smith, 2003; Scannell et al., 2000). Purchased products and services for manufacturing account for more than 60% of the average company's total costs (Degraeve & Roodhooft, 2001). In their case study of a strategic supply partnership, Seal et al. (1999) even document externally purchased materials accounting for 80% of total manufacturing costs. Consequently, decreasing procurement costs for manufacturing possibly result in a significant performance increase (Degraeve & Roodhooft, 2001). Timme & Williams-Timme (2000) calculate a possible 25% increase in stock prices due to a combination of rising revenues, decreasing operational expenses, better utilization of fixed assets and decreasing stocks and customer credits. As a result, the manufacturing phase is subject to numerous joint cost reduction

programs with suppliers that also require effective management control (Carr & Ng, 1995; Gietzmann, 1996; Lamming, 1993; Kajüter & Kulmala, 2005; Seal et al., 1999). Therefore, this dissertation specifically studies MCS design of supplier relations in the manufacturing phase of the supply chain, which we refer to as "manufacturer-supplier relationships" (MSRs).

2. Theoretical background

2.1. Management control system design

The fundamental goal of MCSs is to induce desired behaviour, in other words to influence decision making in attaining strategic objectives (Nixon & Burns, 2005). In an inter-organizational setting, this implies creating bilateral incentives to pursue mutual goals, for which numerous control structures exist. Studies looking into these control structures are, among others, Anderson et al. (2000), Anderson & Dekker (2005), Chalos & O'Connor (2004), Cooper & Slagmulder (2004), Dekker (2004, 2007), Ireland et al. (2002), Kamminga & van der Meer-Kooistra (2007), Langfield-Smith & Smith (2003), Speklé (2001), Sartorius & Kirsten (2005), Seal et al. (1999), van den Bogaard & Speklé (2003) and van der Meer-Kooistra & Vosselman (2000, 2004).

All these studies utilize transaction cost economics (TCE) theory, originally developed by Williamson (1975, 1979, 1985, 1991, 1993, 1996), as theoretical foundation for the design of inter-organizational MCSs. In essence, TCE argues that parties are only boundedly rational and behave opportunistically. Therefore, the total cost of outsourcing is the sum of the supplied component costs and the transaction costs, including costs for negotiation, drawing up contracts, coordination, control and risk of opportunistic behaviour (van der Meer-Kooistra & Vosselman, 2000). Based on the notion that the boundaries of the firm are defined by cost minimizing choices, TCE provides a framework for inter-organizational MCS design that was further developed in studies like Langfield-Smith & Smith (2003), Speklé (2001) and van der Meer-Kooistra & Vosselman (2000). More specifically, TCE identifies three forms of governance structures: markets, hierarchies and hybrids, in which separate structures of market and hierarchy are combined (Williamson, 1991).

In TCE terminology, MSRs are hybrid relations, of which the number has risen significantly in the last two decades (van der Meer-Kooistra & Vosselman, 2006). On the

one hand, the outsourcing of a certain manufacturing activity to a supplier renders vertical integration in a hierarchy unsuitable as governance mechanism. On the other hand, the manufacturing phase of the supply chain occurs after commercial negotiations have taken place. Hence, in the manufacturing phase, price is considered fixed and influenced by outside parties earlier in the supply chain, namely the manufacturer's purchase department and the supplier's sales department. Obviously, this situation renders the market mechanism inappropriate for governing the MSR. Previous research, however, has put forward some important objections to TCE's hybrid type of governance structure. Without contesting the theoretical benefits and case analysis possibilities of TCE in management control studies (e.g. Speklé, 2001; van den Bogaard & Speklé, 2003; Sartorius & Kirsten, 2005), we agree with the two following critiques.

First, TCE considers hybrid governance a homogeneous alternative for market and hierarchy. Hybrid IORs, however, show numerous governance structures serving multiple goals, in which reducing transaction costs only takes part (Osborn & Hagedoorn, 1997). Powell (1990), for example, puts "network organization" between the structures of market and hierarchy, and defines its most important goals as reducing uncertainty and realizing fast access to information. To this end, parties engage themselves to build up a long term network (Powell, 1990). In other words, hybrid IORs are rather heterogeneous and require more than TCE to be effectively studied (Ahrens & Chapman, 2006; Chiles & McMackin, 1996; Dekker, 2004). One useful theory to supplement TCE and not uncommon in inter-organizational MCS studies is organization theory (e.g. Anderson & Dekker, 2005; Cooper & Slagmulder, 2004; Dekker, 2003, 2004; Seal et al., 1999). The main proposition of this theory is that in order to create transactional value, partners cooperatively perform value creating activities (Dyer & Singh, 1998). That way, they become interdependent, because they can not achieve their goals without reliance upon another (Rousseau et al., 1998). More specifically, by jointly pooling resources, determining tasks to be performed and deciding on labour division, partners create interdependent activities. In order to attain their objectives, these activities need to be coordinated across organizational boundaries (Gulati & Singh, 1998; Dekker, 2004).

Second, TCE does not consider the social mechanism of governance, within which transactions are embedded (Langfield-Smith & Smith, 2003). Because of the importance given to opportunism propensity, MCSs for hybrid governance are exclusively formal and primarily aimed at contracts (Nooteboom et al., 1997). Nevertheless, Williamson (1993)

agrees that rational actors do accept risk without setting up formal controls. Yet, according to him, this is the result of calculated risk taking instead of, for example, trust in the other party. Thus, by considering the social context as part of the environment, Williamson (1996) denies the possibility of social controls as a means to reduce opportunism. Therefore, TCE neglects social controls, such as trust, personal relationships and reputational devices in a social network (Dyer & Singh, 1998; Gietzmann, 1996). However, there exists considerable evidence that these more informal controls serve an important role, especially in IORs with large interdependence and high relational uncertainty (Nooteboom et al., 1997). Such climate creates limitations in drawing up a complete contract, because all future contingencies can not be foreseen, are too expensive to foresee or are too expensive or impossible to contract upon. These limitations affect inter-organizational governance choices and increase the role of social controls to discipline suppliers (Gietzmann, 1996). For that reason, our study of hybrid MSRs supplements TCE with relational perspectives, so that our conceptualization of a MCS includes both formal and informal control types. Although MCSs have been conceptualised and categorised in various ways, the current intra- and inter-organizational management control literature, has reached a consensus on these two management controls types (Langfield-Smith & Smith, 2003; Dekker, 2004).

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, by using several performance measurement techniques (Merchant, 1998; Ouchi, 1979). The most important outcome metrics for MSRs are percentage of defects, quality and on time delivery (Gunasekaran, Patel & McGaughey, 2004). Behaviour controls concern specifying, monitoring and evaluating compliance with pre-specified planning, procedures, rules and regulations (Merchant, 1998; Ouchi, 1979). Informal controls are not explicitly designed, but are grown out of shared norms and values, shaped by frequent interaction, meetings and management attitude (Merchant, 1998; Ouchi, 1979). Especially trust building has emerged as a very important informal control instrument in inter-organizational MCSs (e.g. Dekker, 2004). While formal controls reduce risks by altering the incentives for underperformance or opportunism, trust building mitigates these risks by minimizing the fear of underperformance or opportunism to occur (Das and Teng, 2001). Besides trust building, MSRs are governed by clan control (Ouchi, 1979). Based on shared norms, values and a

common goal, a supplier is motivated to achieve that goal (Das & Teng, 2001) because of inter-organizational social pressure (Speklé, 2001) exerted by the manufacturer. More specifically, poor supplier performance leads to unpleasant confrontations with manufacturer management, personal humiliation and a damaged reputation. By acting as negatively valued social sanctions (Bijlsma-Frankema & Costa, 2005), these social consequences create incentives for satisfactory supplier performance and behaviour (Speklé, 2001).

2.2. Contingency theory

To study this MCS design, we use contingency theory. This theory originated with the aim of explaining the structure of organizations by particular circumstances (e.g. Lawrence & Lorsch, 1967). Later, management accounting researchers adopted and further developed the theory in order to explain the design of MCSs in organizations (Donaldson, 2001; Chenhall, 2003; Fisher, 1998; Luft & Shields, 2003). Also in inter-organizational studies, contingency theory is frequently utilized, although some authors not always explicitly mention using the theory (e.g. Chalos & O'Connor, 2004; Dekker, 2004; Kamminga & van der Meer-Kooistra, 2007). Consequently, these studies reveal several situational characteristics influencing MCS design of different IORs, like strategic alliances (Birnberg, 1998; Dekker 2004), joint ventures (Chalos & O'Connor, 2004; Kamminga & van der Meer-Kooistra, 2007), inter-organizational cost management relations (Cooper & Slagmulder, 2004), outsourcing relations (Langfield-Smith & Smith, 2003; van der Meer-Kooistra & Vosselman, 2000) and networks (Kajüter & Kulmala, 2005). Yet, to our knowledge, little inter-organizational management control research specifically investigated contingency theory's explicative power for supplier relations during the manufacturing phase of the supply chain. Obviously, some papers study influences on MCS design in manufacturing environments, like the impact of manufacturing flexibility (Abernethy & Lillis, 1995), customization and related interdependence (Bouwens & Abernethy, 2000), profit centre strategy (Lillis, 2002), production strategy and production technology (van Veen-Dirks, 2006). However, all these studies investigate characteristics influencing MCS design within the boundaries of only one organization. Consequently, the design of MCSs that govern different types of inter-organizational supplier relationships involved in the manufacturing of complex products (Gietzmann, 1996) remains under-explored. Therefore, more attention towards explaining this type of MCS design is called for (Cooper &

Slagmulder, 2004; Langfield-Smith & Smith, 2003; van der Meer-Kooistra & Vosselman, 2006). This dissertation answers that call by tailoring contingency theory to the setting of MSRs.

To that end, this dissertation utilizes Donaldson's (2001) categorization of contingency theory elements, 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, a fit of the MCS design and the influencing contingency variables results in higher operational performance, whereas a misfit decreases performance (Donaldson, 2001). This third contingency theory element 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). Thus, it must be clear that performance forms the central variable in the contingency theory of organizations, which aims at explaining organizational success or failure (Donaldson, 2001).

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). This fit-performance association has been studied with respect to management accounting techniques, like Activity Based Costing (e.g. Cagwin & Bouwman, 2002; Ittner, Lanen & Larcker, 2002) and the Balanced Scorecard (e.g. Hoque & James, 2000; Maiga & Jacobs, 2003). Other studies investigated the performance effect of a fit between strategy and management accounting systems (e.g. Gerdin & Greve, 2004; Ittner, Larcker & Randall, 2003). Yet, empirical evidence on the validity of the fit-performance association of MCS design for MSRs remains limited. Most investigations on contingency associations of inter-organizational MCSs only assume the fit-performance association to hold, so that further research on this association is justified (Dekker, 2004; Kamminga & van der Meer-Kooistra, 2007). This doctoral dissertation fills that research gap, as will be clarified in the next section.

3. Overview of manuscripts and theoretical framework

The dissertation consists of three manuscripts, each investigating a different research question of MCS design for MSRs. Each manuscript is written to be read independently of the others. Nevertheless, all manuscripts are inextricably linked, so that there is a certain degree of overlap in their theoretical and methodological sections. For example, each manuscript contains a specific theoretical contingency framework. Yet, these frameworks are dependent on each other, in the sense that the frameworks of the second and third manuscript are extended versions of the ones in the first and second manuscript respectively. Consequently, all specific frameworks can be captured in one generic framework, indicating which part of the framework is studied in each manuscript. This generic framework can be found in figure 0.1 and will be used to provide an overview of the manuscripts and indicate the connections between them. For each manuscript, we discuss and motivate the research questions and introduce their theoretical framework by referring to figure 0.1.

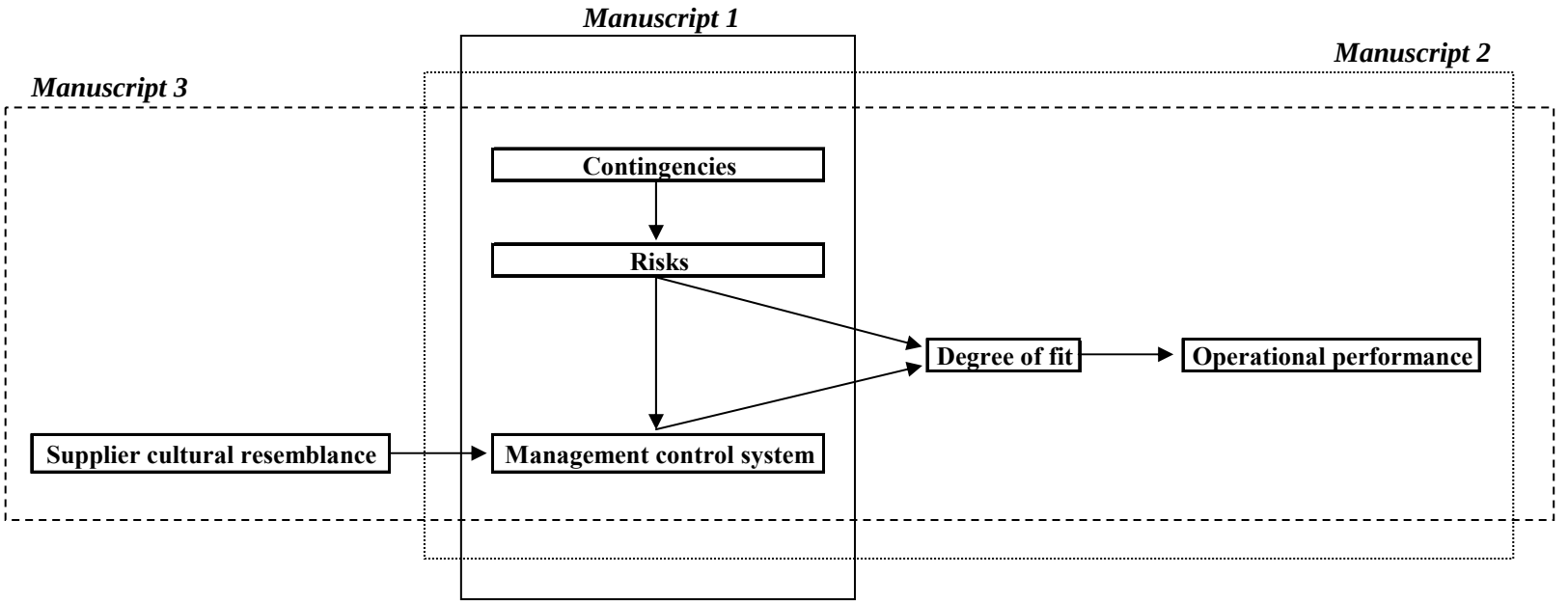

Figure 0.1: Generic theoretical framework

3.1. Manuscript 1 – Management control of supplier relationships in manufacturing: A case study in the automotive industry

In the first manuscript, we investigate how the MCS of MSRs is designed. In particular, we study how important informal controls are in that design, as prior literature offers different MCS designs for MSRs with respect to the level of informal control. On the one hand, empirical research on IORs, such as R&D collaboration (Cooper & Slagmulder, 2004), strategic alliances (Dekker 2004) and joint ventures (Kamminga & van der Meer-Kooistra, 2007), found MCSs that combine both formal controls and more informal controls. Also the execution of outsourced services, like industrial maintenance (van der Meer-Kooistra & Vosselman, 2000), IT (Langfield-Smith & Smith, 2003) and accounting (Nicholson, Jones & Espenlaub, 2006) is governed by a MCS combining formal and informal controls. On the other hand, differences between MSRs and other types of IORs, could lead to a different MCS design. Prior research argued that manufacturing is more formal than procurement and R&D, so that formal controls are suited mechanisms to control MSRs (Das & Teng, 2001). Moreover, manufacturing concerns knowledge exploitation, instead of knowledge exploration, which is most effectively controlled by formal controls (Bijlsma-Frankema & Costa, 2005). Based on these characteristics, MSRs could be expected to be governed by primarily formal controls with little informal controls.

Yet, besides illustrating how manufacturers design supplier MCSs and to what extent this design differs from designs in other IORs with respect to the level of informal control, the first manuscript also aims at explaining MCS design. With respect to Donaldson's (2001) categorization of contingency theory elements, manuscript 1 regards the first element, proposing that certain contingencies are associated with MCS design. To investigate this proposition, we suggest a refined theoretical contingency framework for MSRs, set up from the position of the manufacturer and based on recent inter-organizational management control theory. With reference to figure 0.1, this framework concerns the three constructs in the centre of the generic framework. These constructs visualize the associations between contingency variables influencing the level of risks and management control techniques governing the risks. MSRs are subject to performance risk and relational risk (Das & Teng, 2001) and these risks are increased by several contingencies, like task uncertainty (Woodward, 1965) and environmental uncertainty

(Langfield-Smith & Smith, 2003). As mentioned before, MCSs contain two types of control, namely formal and informal control techniques (Langfield-Smith & Smith, 2003).

In order to illustrate the validity of the framework associations in practice and answer how and why manufacturers design their MCS, the first manuscript contains an in-depth case study of the MSRs between a facility (VCG) of the automotive manufacturer Volvo Cars Corporation and a selection of first-tier supplier facilities. As the automotive industry is characterized by high levels of component outsourcing and extreme competitive pressure, manufacturers initiate continuous improvement projects with suppliers, which require appropriate MCSs to organize and manage the MSR (Alford, Sackett & Nelder, 2000; Carr & Ng, 1995; Cooper & Slagmulder, 1999; Scannell et al., 2000). In that respect, one particular automaker, namely Toyota, is known for partnering with suppliers and installing softer forms of control including trust (Dyer & Nobeoka, 2000). Other automakers, however, govern the search for continuous improvement by heavily formalized supplier relations (Alford et al., 2000). In other words, also automotive practice shows evidence of high and low levels of informal control. Therefore, the first manuscript investigates MCS design of automotive MSRs. To that end, we collect cross-sectional data on VCG's MCS of MSRs with good performance. The findings of this manuscript provide a clear picture of VCG's management control techniques for different types of suppliers. That way, our findings provide qualitative insight into the importance of informal control in VCG's MCS and into the explicative power of contingency variables on MCS design.

3.2. Manuscript 2 – The impact of inter-organizational management control systems on performance: A longitudinal case study of a supplier relation in automotive

The second manuscript is a follow-up study that further investigates the contingency effects of MCS design. In particular, this manuscript studies contingency theory's third element (Donaldson): a MCS design, contingent on situational characteristics, is associated with better performance, compared to a situation where the contingency fit would be temporarily out of place (Kamminga & van der Meer-Kooistra, 2007). Like the association between MCS design and situational contingencies, which was studied in the first manuscript, this fit-performance association remains under-explored (Chenhall, 2003; Dekker, 2004). Nevertheless, the fit-performance association deserves further research, validating its assumption in prior studies (e.g. Cooper & Slagmulder, 2004; Dekker, 2004), because it

forms contingency theory's main interest (Donaldson, 2001). Therefore, this study aims at illustrating the validity and refining the dynamics of this assumption in practice.

For that purpose, we extend the theoretical contingency framework of manuscript 1 with two constructs, as depicted on the right hand side of figure 0.1. First, the degree of fit conceptualizes the degree to which the level of management control fits the level of risks. In essence, it serves the same purpose as the arrow from risks to MCS in the framework of manuscript 1, namely conceptualizing the association between risks and MCS design. Still, the extra construct is introduced, because it allows specifying a varying degree of fit over time, which was not needed in the framework of manuscript 1. Second, we add operational performance. This variable is measured by means of product quality, as this KPI is emphasized more than timeliness and cost (Waters-Fuller, 1996). The arrow from degree of fit to operational performance represents the fit-performance association. 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, the second manuscript 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).

We investigate these propositions by means of a follow-up case study at VCG. Contrary to the case study of manuscript 1, aimed at investigating the "average" MCS of VCG via cross-sectional data on several MSRs at one point in time, this case study is an in-depth study of one particular MSR based on longitudinal data. As the fit-performance association is only visible in changing MSRs experiencing fluctuating performance over time, we specifically investigate a MSR that was subject to considerable change and severe operational difficulties. Findings of this study confirm both our static and dynamic propositions and that way contribute to refining inter-organizational management control theory. Furthermore, our longitudinal case study offers the opportunity to refine the either complementary or substitutive relation between trust and formal control (Das & Teng, 1998), called for by e.g. Anderson & Dekker (2005) and van der Meer-Kooistra & Vosselman (2006).

3.3. Manuscript 3 – The impact of cultural resemblance on management control of supplier relations: Longitudinal evidence in the automotive industry

The third manuscript continues our line of research on MCS design by exploring the role of organizational culture, a variable unaddressed in manuscripts 1 and 2. These manuscripts provide evidence that MCSs are contingent on situational characteristics and that this MCS fit is associated with good performance, both statically and dynamically (Donaldson, 2001). So, with reference to performance, manuscript 2 shows the negative *consequence* of a misfitted MCS, namely decreasing performance, and illustrates a manufacturer's attempts to change the MCS and regain a MCS fit. Following up on these findings, we believe it is worthwhile to investigate variables *influencing* the speed of MCS change, so that temporary misfits and decreasing performance, due to changing circumstances, are less likely to occur (Kamminga & van der Meer-Kooistra, 2007; van Veen-Dirks, 2006). Since the manufacturer's MCS is the material artefact of its underlying organizational culture (Rousseau, 1990), organizational culture might be such a variable (Harrison & McKinnon, 1999). Nevertheless, studies on organizational culture, especially in IORs, are scarce (Chenhall, 2003; Scheytt & Soin, 2006; van der Meer-Kooistra & Vosselman, 2000). The third manuscript fills that research gap. In particular, the focus lies on the degree to which a supplier's culture resembles the manufacturer's culture, as the impact of cultural resemblance on MCS dynamics remains unaddressed (Harrison & McKinnon, 1999; Henri, 2006). Therefore, the aim of this manuscript is to illustrate whether the degree of cultural resemblance between manufacturer and supplier affects MCS dynamics, and that way the degree of MCS fit, in times of changing contingencies.

To that end, we further extend the theoretical contingency framework of manuscript 2 with the construct supplier cultural resemblance on the left hand side of figure 0.1. Provided that we take on the position of the manufacturer, this variable is defined as the degree to which a supplier culture is hierarchical or developmental and resembles a developmental manufacturer culture. Whether an organizational culture is hierarchical or developmental depends on the organization's preference for the values control versus flexibility and external focus versus internal focus of the Competing Values Model (CVM) (Quinn, 1988; Quinn & Kimberly, 1984; Quinn & Rohrbaugh, 1983). Supported by this conceptualization of organizational culture, we propose that supplier cultural resemblance is associated with a MCS that changes fast enough to fit changed contingencies and that way contributes to operational performance.

We study this proposition by means of another follow-up case study at VCG. The third manuscript investigates the same contingency changes and MCS dynamics as in manuscript 2 for a second MSR. This additional MSR is similar to the MSR studied in manuscript 2, except for the degree of supplier cultural resemblance. More specifically, the culture of the additional supplier is of the developmental type, resembling VCG's culture, while the culture of the manuscript 2 supplier is of the hierarchical type. That way, these MSRs allow adequately comparing the effect of high and low supplier cultural resemblance on the MCS design, while keeping contingency effects, as shown in manuscript 1, constant. Obviously, these contingencies do considerably change over the period under study in order to explore the effect of supplier cultural resemblance on MCS dynamics. Yet, their change is similar for both MSRs, so that a constant external effect is preserved over time. The case findings confirm our theoretical proposition by illustrating the positive impact of resembling organizational cultures on the speed of MCS change, and hence the level of MCS fit and performance. Furthermore, the case contributes to the inter-organizational management control literature by showing the mechanisms by which cultural resemblance enhances management control. As these findings benefited from conceptualizing organizational culture via the CVM, the third manuscript also demonstrates the usefulness of applying the CVM for describing organizational culture in qualitative studies (Bhimani, 2003).

4. Research methodology

The research methodology of this doctoral dissertation is case based. In this part of the general introduction, we first motivate our choice for the case study method, clarify our research goals and indicate the case's unit of analysis. Second, we discuss our case company selection criteria and motivate our choice for the automotive industry and a specific original equipment manufacturer (OEM), namely VCG, of which this section also provides a brief description. Third, we describe our main data collection techniques. Fourth, we provide some details concerning the data analysis.

4.1. Case study research

Yin (2003) defines a case study as "an empirical enquiry that investigates a contemporary phenomenon within its real life context, especially when the boundaries between phenomenon and context are not clearly evident. The case study inquiry copes with the

technically distinctive situation in which there will be many more variables of interest than data points, and as one result relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result benefits from the prior development of theoretical propositions to guide data collection and analysis" (Yin, 2003, p. 13-14). Hence, a case study is an investigation of a real life phenomenon, relying on multiple sources of evidence and benefiting from prior development of theoretical propositions. Especially an explanatory case suits this dissertation's research setting, because it concerns explaining complex phenomena within their real life context and finding answers to how and why questions about these phenomena. Furthermore, case study research is appropriate for studying phenomena of which empirical evidence is relatively limited. Finally, case studies suit investigating the dynamics of processes, which is also an important research goal of this dissertation (Eisenhardt, 1989; Yin, 2003).

In Keating's (1995) terminology, this dissertation aims at "theory refinement", which involves seeking "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). This goal represents the middle ground between "theory discovery", i.e. describing novel phenomena, and "theory refutation", i.e. disconfirming well specified theories by bringing in negative evidence. A specific way to establish theory refinement is "theory illustration", by identifying "aspects of the illustrated theory that require reformulation or more rigorous specification" (Keating, 1995, p. 71). Based on this categorization, the research aims of the three manuscripts in this dissertation are defined as follows. The aim of the first manuscript is refining existing inter-organizational management control theory for the relatively under-explored manufacturing phase of the supply chain, by illustrating how manufacturers design supplier MCSs, how important informal controls are in that design and how the design can be explained by means of a theoretical contingency framework. The goal of the second manuscript is theory refinement, by illustrating MCS dynamics and the influence on operational performance. More specifically, this manuscript shows how a misfitted MCS, aggravating performance, is changed towards a design fitting the contingencies and risks, and therefore contributing to performance. The third manuscript aims at refining theory by illustrating the impact of supplier cultural resemblance on the MCS of MSRs. In particular, the manuscript reveals how supplier cultural resemblance affects the speed of MCS change over time. According to Keating (1995), these theory refinement goals need a clear theoretical starting point,

supplemented with an openness to discover unexpected findings. To balance these theory attachment and detachment requirements, we developed a theoretical framework for each of the manuscripts as described in the previous section. These frameworks guided our data collection, but at the same time allowed sufficient openness. Based on the data, we assessed the explanatory power of the theoretical frameworks.

The following examples of case studies strengthen the argument that cases allow investigating in detail relational patterns and a wide range of variables influencing the structure and performance of MSRs (Sartorius & Kirsten, 2005): Cooper & Slagmulder (2004), Dekker (2004), Hakansson & Lind (2004), Kajüter & Kulmala (2005), Kamminga & van der Meer-Kooistra (2007), Langfield-Smith & Smith (2003), Sartorius & Kirsten (2005), Seal et al. (2004) and van der Meer-Kooistra & Vosselman (2000). These studies argue that the investigation of different MCS designs and the influence on performance by means of quantitative research is more difficult, because it is not exactly known what to ask or to look for. The meaning of MSRs and subsequent behaviour of companies and their employees is very complex, so that an in-depth study is more effective in discovering how different parties really interpret certain MSRs and whether the MCS is designed accordingly. This argument further justifies our choice for an in-depth case study and forms the reason why the current literature calls for more research of this type (e.g. Langfield-Smith & Smith, 2003; Dekker, 2004; Hakansson & Lind, 2004). Especially the longitudinal case design of the second and third manuscript is emphasized as a suited future research design on MCS dynamics and the impact on performance, as this design makes it more effective to study cause and effect (e.g. Anderson & Dekker, 2005; Dekker, 2004, 2007; Ittner et al., 1999; Rinehart et al., 2004; Scannell et al., 2000; van der Meer-Kooistra & Vosselman, 2000). Indeed, only longitudinal data can reflect changes in MCS design and performance, which are needed to refine the dynamics of the fit-performance association (Luo, 2002).

In most inter-organizational studies, the unit of analysis is one dyadic relation between two independent parties (van der Meer-Kooistra & Vosselman, 2006). Since there exist different dyadic MSRs within one manufacturer and our dissertation concerns contingency research on supplier MCS design, our unit of analysis consists of specific MSRs. Dyer & Singh (1998) explicitly propose the 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. The fact that this approach is suited for studying the "inter-organizational rent-generating process" (Dyer & Singh, 1998, p. 661) further justifies our choice for the MSR unit of analysis. In order to answer the proposed research questions, we analyzed all relations after the manufacturer had decided to outsource the manufacturing activities. In other words, we addressed neither the make-or-buy decision nor related commercial negotiations, but collected data from the start of production onwards.

4.2. Case company selection

As case company selection forms an important dimension of case study research (Eisenhardt, 1989), the selection of the case company and several suppliers was influenced by two selection concerns: theoretical suitability and open and flexible access to senior management (Christopher & Jüttner, 2000). Based on these concerns, we chose Volvo Cars Gent (VCG), the Belgian automotive production facility of the Swedish Volvo Cars Corporation (VCC), as manufacturing case company. In this section, we motivate our choice for the automotive industry, VCG and a selection of suppliers. We end the section with a brief description of VCG.

4.2.1. Automotive industry

We chose the automotive industry for our study on MCS design for MSRs, because this industry is considered a trendsetter in supplier relationships (cf Womack & Jones, 1990; Lamming, 1993) and already previously studied (e.g. Anderson et al., 2000; Berry, 1994; Carr & Ng, 1995; Dyer, 1996(a), 1996(b), 1997; Dyer & Chu, 2000; Dyer & Nobeoka, 2000; Dyer & Chu, 2003; Gulati, 1995; Gulati & Singh, 1998; Ittner et al., 1999; Kajüter & Kulmala, 2005; Lamming, 1993; Rinehart et al., 2004; Scannell et al., 2000; Seal et al., 1999). Automotive manufacturing is even referred to as "a natural laboratory for testing transactions cost theory" (Anderson et al., 2000, p. 728). An automobile is an extremely complex product manufactured with thousands of components, working together as a system (Dyer & Chu, 2003). As a result, also this industry increasingly outsourced non-core activities (Scannell et al., 2000). Indeed, externally purchased materials account for 60% to 70% of total automotive manufacturing costs (Taylor, 1994; Vasilash, 1997). Volvo for example acknowledges that up to 70% of the total car production cost results from buying modules made by suppliers outside Volvo (Von Corswant, 2003). Consequently, automotive manufacturers started to rely on suppliers to deliver competitive advantages in

the form of lower costs (Carr & Ng, 1995). To that end, a variety of supply chain management practices has been implemented, such as lean supply and continuous improvement. These practices induce the need for an appropriate MCS with two-directional communication and trust to organize and manage the relationships (Carr & Ng, 1995; Cooper & Slagmulder, 1999; Gietzmann, 1996; Lamming, 1993; Scannell et al., 2000). However, according to Scannell et al. (2000), these key practices in automotive lack sufficient academic study, which further justifies our choice for this industry.

Besides suiting our research on MCS design of MSRs, the automotive industry also fulfilled specific research requirements of the different manuscripts. As the first manuscript investigated MCS design and the importance of informal control, we needed an industry that reflected the theoretical tension concerning this importance. The automotive industry was an appropriate choice, as that industry shows clear evidence of high and low levels of informal control. More specifically, Toyota is known for partnering with suppliers and installing softer forms of control (Dyer & Nobeoka, 2000), while other automakers govern the search for continuous improvement by heavily formalized supplier relations (Alford et al., 2000). For manuscripts 2 and 3, studying MCS dynamics, we required MSRs that heavily changed, but were not terminated due to unsatisfactory supplier performance. The manufacturing phase of an automotive supply chain fulfilled both needs. 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, even when they are underperforming for some time because of a lack of capacity and sufficient supply quality at potential replacing suppliers.

4.2.2. Volvo Cars Gent

Out of several automotive manufacturers, we chose Volvo Cars Gent (VCG) for three reasons.

First, exploratory interviews learned that VCG was considered a “best practice”. In 2005, VCG was financially healthy, operationally profitable and highly appraised in the international automotive sector. Additionally, VCG’s supply was evaluated one of the best in automotive benchmark studies. 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). Furthermore, VCC and VCG were positively evaluated by suppliers regarding their

approach towards them. Also umbrella organizations, like the federation of the technology industry, which are able to compare their members' different supplier relationships, were in favour of VCG's MSRs. Hence, by choosing a "best in class" manufacturer, we aimed at gathering more convincing evidence, especially with respect to performance fluctuations, which are less likely driven by manufacturer characteristics.

Second, VCG suited the research design of manuscripts 2 and 3 by experiencing changing MSRs due to the introduction of two extra car models. Before 2004, VCG operated in two shifts, manufacturing around 150.000 cars per year of two models (Volvo S60 and V70). In 2004, VCG started production of two extra models (Volvo S40 and V50) on another platform, which substantially changed all just-in-sequence MSRs. That way, VCG offered the opportunity to study MCS dynamics and the effect on operational performance after a drastic contingency change in 2004.

Third, exploratory interviews with VCG management showed remarkable openness, interest in the research topic and willingness to cooperate due to the OEM's openness and desire to learn. VCG confirmed this willingness by allowing us to gather first hand data on recent MSRs. Especially with respect to the second and third manuscript, documenting a severe performance decrease of one of VCG's MSRs, VCG showed high commitment to our research project. In particular, VCG fully cooperated in gathering data concerning the events that contributed to the performance decrease. Furthermore, the automaker refused company disguising in the manuscripts of this dissertation.

Nevertheless, this openness and commitment only followed our continuous emphasis on research ethics and confidentiality. It must be clear that it took a long time before we got settled into VCG and arrived at a stage where extremely confidential matters were openly discussed. To that end, we not only spent numerous hours interviewing several VCG managers, but also took the time for a full guided tour of VCG's production facility. That way, we deepened our understanding of automotive production and built personal relationships with a number of highly motivated key informants. Their help was indispensable to gather the necessary data and to introduce us to the suppliers that were selected for a more in-depth study. As a result, our first study led to a research setting, which offered the best circumstances for additional research. Hence, as VCG suited the case research design of manuscripts 2 and 3, we opted to continue our research with the same automotive OEM, instead of choosing another one.

4.2.3. VCG suppliers

The selection of the case suppliers was also based on theoretical suitability and willingness to cooperate. Taking into account differences found at VCG and discussions with VCG management about supplier suitability and participation willingness, four high value-added just-in-sequence suppliers, two low value-added just-in-sequence suppliers (of which one is logistic provider) and two batch suppliers were chosen for the first manuscript. Except for the batch suppliers, all suppliers were located near VCG's facility. Furthermore, all MSRs displayed good operational performance at the time of our study. For manuscript 2, however, we selected one of VCG's high value-added just-in-sequence MSRs, studied in manuscript 1, that experienced considerably changing contingencies and fluctuating performance over time. For the third manuscript, this MSR was supplemented with a second high value-added just-in-sequence MSR, which resembled the first one on all situational characteristics, including the contingency changes, but differed with respect to cultural resemblance with VCG.

4.2.4. VCG case company description

Volvo Cars Gent is the largest assembly unit of Volvo Cars Corporation, a Swedish automotive OEM, producing cars since 1927. In 1999, VCC became part of the Premier Automotive Group, including Jaguar, Aston Martin and Land Rover, owned by Ford Motor Company. In 2005, VCG celebrated its 40th birthday and already exceeded building 3 million Volvos. At that time, the Belgian company employed 5.025 people, had a yearly turnover of about €4,2 billion and produced 258.479 cars per year. This production was spread over four Volvo models, namely the S40, V50, S60 and V70, of which the first two were built on the so called P1 (small) platform and the latter two on the older P2 (large) platform. All four models were built on only one assembly line, which is rather unique in automotive and requires ultimate flexibility of all assembly processes.

VCG's production starts in the welding factory (GA), where pressed steel plates from Volvo's press factories are welded together into a car body. The welding factory is the most robotised VCG department and operates 610 state-of-the-art robots. In the paint shop (GB), welded bodyworks are provided with various paint and protective coatings. Obviously, also the paint shop is largely automated, with over 95 percent of the paint being applied by robots or spraying machines. During final assembly (GC), the painted bodywork becomes a car with fitted interior elements, such as seats, and mechanical components, like

engine, gearbox and suspensions. Finished cars are subsequently transported to all parts of the world, in particular to the United States, to which about 23% of the production capacity is exported.

Similar to other OEMs, production philosophy at VCG evolved from *push* to *pull*. In the past, production was scheduled on the basis of company capacity limitations. This resulted not only in unsold cars and unusable stock, but also in customers that did not get the car they desired. Especially this last shortcoming led to a "pull" system or "customer ordered production" (COP), a production planning entirely based on customer orders and their wishes. These customers were offered a larger choice in possible car configurations and guaranteed that their car would be delivered within a previously defined short time span. For Europe, the targeted lead-time for a car delivered to dealer lies between two to four weeks. Yet, this new approach created both a variant explosion of possible cars, for which stocking all components was physically and financially impossible, and the possibility for customers to make late order changes until four hours before the car goes on line at VCG. Hence, VCG needed flexible manufacturing and ordering, swift communication with suppliers and outsourcing of manufacturing activities to reliable suppliers.

The first outsourcing project in 1984 involved car seat production, for which a textile manufacturer possessed substantially more core competences. Already in 1995, six additional important modules were produced externally, namely bumpers, dashboards, engines, fuel tanks, wheels and floor mats. By 2003, this number had risen to 20 suppliers, delivering 77% of total material value. Obviously, outsourcing advantages differed per type of activity, like postponing variant explosion for wheels or limiting warehouse space for bumpers and fuel tanks. Additionally, all suppliers were located in the neighbourhood of VCG in order to reduce transport costs and facilitate fast quality problem solving. Moreover, most suppliers now jointly work in what is called a SILS (supply in line sequence) centre, operated by a logistic provider and located five kilometres from VCG's facility. This supplier park offers several advantages, such as limited overhead costs, competence sharing, joint transport to VCG and easy reshuffling. The most important advantage of local supply, however, is the possibility for suppliers to produce and deliver components both "just-in-time" (JIT), i.e. when the car for which the components are intended has come onto the final assembly line in factory GC, and "in-sequence", i.e. in the same order as the cars on the production line. Indeed, following COP, every car on the

assembly line is different. Consequently, each component of a particular supplier order is potentially different as well. In order to reduce stocks and preserve maximum flexibility at VCG, these components need to be delivered both just-in-time and in the same order as the cars on the assembly line. Therefore, VCG considers local supply of ultimate strategic importance to make just-in-time and in-sequence, or "just-in-sequence" (JIS), supply feasible. VCG's MCS on these JIS suppliers forms the main focus of this doctoral dissertation.

4.3. Data collection

The main data gathering technique consisted of 34 semi-structured interviews. These interviews were held in eight rounds between October 2005 and December 2007. Following van der Meer-Kooistra & Vosselman (2000), we first interviewed executive managers of the umbrella organizations AGORIA (the Belgian federation of the technology industry), FEBIAC (the Belgian federation of the car and two-wheeler industries) and CLEPA (the European umbrella membership organization for the global automotive supply industry). That way, we increased our understanding of the automotive industrial environment and became well informed on recent problems and developments in the field of outsourcing manufacturing activities in this industry. Second, we interviewed all VCG managers involved with suppliers, 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. Third, we interviewed supplier managers, in particular plant managers of JIS suppliers and VCG responsibles of batch suppliers. Fourth, we re-interviewed specific VCG managers most involved with suppliers spoken to previously. For the second and third manuscript, we reiterated the third and fourth round, meaning interviewing managers at the selected suppliers concerning our research questions and then re-interviewing VCG managers on the same issues. Table 0.1 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.

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	3	55; 62; 58	10/02/2006; 29/05/2006; 13/10/2006
	Logistic Engineering Manager	1	68	10/02/2006
	Supplier Support & Purchasing Manager	4	92; 95; 98; 137	15/02/2006; 18/04/2006; 29/05/2006; 21/11/2007
	Material Planning Manager	1	73	15/02/2006
	Supplier Quality Assurance Manager	3	44; 96; 67	15/02/2006; 29/05/2006; 13/10/2006
	Human Resource Manager	1	50	15/02/2006
	Finance Manager	1	47	15/02/2006
	IT Manager	1	67	13/03/2006
SAG1	CEO SA1	1	68	17/12/2007
	Plant Manager	1	67	17/12/2007
SAG2	Plant Manager	3	106; 74; 116	13/03/2006; 18/04/2006; 26/11/2007
	Human Resource Manager	1	51	29/03/2006
	Quality Manager	2	125; 121	29/03/2006; 18/07/2007
HVA JIS (3)	Plant Manager	1	164	30/03/2006
HVA JIS (4)	Plant Manager	1	102	3/05/2006
HVA JIS (5)	Plant Manager	1	116	10/10/2006
LVA JIS (1)	Plant Manager	1	68	24/05/2006
LVA JIS (2)	Plant Manager	1	121	6/10/2006
Batch (1)	Commercial Service & Quality Manager	1	61	27/09/2006
Batch (2)	Customer Service Manager & VCG Account Manager	1 (joint)	73	27/10/2006
FEBIAC	Advisor Automotive Suppliers Section	1	approx 60	10/10/2005
CLEPA	CEO Strategic and International Relations & Aftermarket	1	76	15/11/2005
AGORIA	Director Automotive	1	90	9/05/2006

Table 0.1: Interview data summary

All interviews aimed at building a trusting relation and developing a dialogue with the interviewees, which permitted them to discuss their own concerns. The interviews were tape recorded electronically (except for one) and structured by an interview protocol with open-ended questions, based on the theoretical framework and tailored to fit the interviewee's organization and the research question under study. This approach allowed covering 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 three 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. This feedback was subsequently transcribed as well. Interview transcripts were written in prose, for two reasons. In order to start an open discussion on MSRs and their performance, which is a very sensitive topic, we explained the use of the tape recorder as a mnemonic device for ourselves. Hence, literally transcribing the interviewee's words could have offended the interviewee and jeopardised further cooperation. Second, 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 interviewee approved the final transcript, we received absolute certainty on the written document and all interpretations made during transcribing. We believed this approach was more efficient than literally writing questions and answers containing all errors and indistinctness, made during the interview.

For the first manuscript, we supplemented the interview data with archival research of internal and public data, such as company presentations, meeting minutes, supplier performance follow-up data and annual reports. We are convinced that content analysis of these data sources provided important additional insights in VCG's MSRs. The most important contribution of this data gathering methodology was the possibility to triangulate (Scapens, 1990) different findings from the methods. The resulting triangulation enabled to crosscheck findings and made conclusions more reliable and convincing (Yin, 2003). During the triangulation process, we certainly valued the role of our key informants at both VCG and the suppliers.

4.4. Data analysis

The data analysis followed a structured iterative approach. Already during interview transcribing, a first analysis was performed by highlighting parts of the transcripts 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 and resulted in an extensive document, containing coded transcript extracts related to the theoretical constructs found in the data. The most important techniques to enhance our theoretical sensitivity during the coding process were asking questions (who?, when?, where?, what?, why?, how? and how much?) and making comparisons (Strauss & Corbin, 1999). In this process, also the tape recorder was utilised in order to capture facts and findings coming up during the analysis. As with interviews, these tapes were subsequently transcribed and further studied. Together with the rich collection of original data, the resulting document was used for writing up the case studies. As the case studies of the second and third manuscript were longitudinal, the transcript extracts of these studies were ordered chronologically.

To structure and interpret the longitudinal case studies of the second and third manuscripts in relation to their contingency frameworks, we used the specific research methods of temporal bracketing and variance (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 frameworks, which allow analyzing how change in the influencing variables affects change in the dependent variable. 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 static and dynamic propositions respectively.

All case study descriptions and following discussions were approved for publication by VCG and the two suppliers studied, without having to make changes.

Manuscript 1

Management control of supplier relationships in manufacturing: A case study in the automotive industry

Abstract

This paper studies management control system design of supplier relationships in manufacturing, a supply chain phase currently under-explored. Compared to supplier relations during procurement and R&D, which research found to be governed by a combination of formal and informal controls, supplier relations in manufacturing are more formal, so that they could be governed by more formal and less informal controls. In order to refine management control theory, we propose a theoretical framework specifically adapted for the manufacturing phase. This framework is investigated by means of an in-depth case study of the supplier management control system of a Volvo Cars production facility. We identify three types of suppliers that visualize the associations in the framework and illustrate the framework's explicative power in automotive manufacturing. Furthermore, the case contradicts that supplier relations in the manufacturing phase are governed by little informal control, because the automaker highly values the role of trust building and social pressure. Most notably, a structured supplier team functions as a clan and establishes informal control among participating suppliers, which strengthens the automaker's control on dyadic supplier relations.

1. Introduction

In the current economic environment, characterised by globalisation and enhanced levels of competition, companies require an effective supply chain with inter-organizational relationships (IORs) to strive for sustainable competitive advantage. Not surprisingly, studies show that IORs have a high potential impact on the organization's performance (e.g. Anderson & Dekker, 2005). Literature, however, also argues that many IORs do not provide the expected benefits and are often terminated because of managing difficulties (Ireland, Hitt & Vaidynanath, 2002). Academics often propose that lack of coordination and opportunistic behaviour of partners are the two main reasons for the relatively high relationship failure rate (e.g. Dekker, 2004). Hence, management control systems (MCSs) might play a critical role in preventing such failure, by establishing governance mechanisms to control the relationship (Ireland et al., 2002).

The fundamental goal of MCSs is to influence decision making in attaining strategic objectives (Nixon & Burns, 2005). In an inter-organizational setting, this implies creating bilateral incentives to pursue mutual goals. Already in the mid-nineties, scholars started calling for more attention for this topic (e.g. Hopwood, 1996; Otley, 1994), and have not stopped since (e.g. van der Meer-Kooistra & Vosselman, 2006). Consequently, inter-organizational MCSs have been studied from several angles, including outsourcing (e.g. Anderson, Glenn & Sedatole, 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). Yet, the main emphasis was put on relational collaboration during the first phases of the supply chain, namely procurement, which involves the make-or-buy decision, partner selection and contract design, and R&D. Although this historical focus is certainly justified, management control in a later phase of the supply chain, namely manufacturing, remains relatively under-explored (Cooper & Slagmulder, 2004; Langfield-Smith & Smith, 2003; Scannell, Vickery & Dröge, 2000). However, purchased products and services for manufacturing account for more than 60% of the average company's total costs (Degraeve & Roodhooft, 2001) and are subject to continuous improvement with suppliers, also requiring adequate management control. Therefore, this study illustrates how manufacturers design the MCS of supplier relations in the manufacturing phase of the supply chain, which we refer to as "manufacturer-supplier

relationships" (MSRs). In other words, we abstract from procurement and R&D influences.[1]

Nevertheless, management control research on previous supply chain phases, offers a first theoretical insight into how a MCS for MSRs could look like. In particular, prior empirical research on IORs such as R&D collaboration (Cooper & Slagmulder, 2004), strategic alliances (Dekker 2004) and joint ventures (Kamminga & van der Meer-Kooistra, 2007) found MCSs that combine both formal controls, like outcome controls, and more informal controls, such as trust building. Also the execution of outsourced services, like industrial maintenance (van der Meer-Kooistra & Vosselman, 2000), IT (Langfield-Smith & Smith, 2003) and accounting (Nicholson, Jones & Espenlaub, 2006) is governed by a combined MCS. So, if we assume these findings to hold for other IOR types and neglect potential characteristic differences, MSRs could be expected to be governed by a combination of formal and informal control as well.

Yet, by taking into account differences between MSRs and other types of IORs, the MCS design could be different. In that respect, the literature argues that manufacturing is more formal than procurement and R&D. Indications for that argument and its consequences for management control can be found in the management control framework of Das & Teng (2001). Based on the variables in their framework[2], task programmability and outcome measurability, it should be clear that for manufacturing both variable levels are high; or at least *higher* than in the case of procurement and R&D. Consequently, the framework indicates that formal controls are suited mechanisms to govern MSRs. This argument is strengthened by the type of knowledge usage in MSRs, for which there exists a clear distinction between knowledge exploration and knowledge exploitation. On the one hand, it is argued that the first supply chain phases, like procurement and R&D, aim at

[1] In terms of research methodology, this abstraction is put into operation by studying MSRs between a manufacturer facility and supplier facility only dealing with manufacturing, while procurement and R&D are handled by their respective mother companies (cf part three of this paper "research methodology").

[2] Although this framework was originally developed by Ouchi (1979) for use in MCS design within organizations, Das & Teng (2001) further adapted it for use in IORs. Task programmability refers to the degree to which managers understand the transformation process in which appropriate behaviour is to take place. Outcome measurability refers to the ability to measure outcome precisely and objectively. When outcome measurability is high/low and task programmability is low/high, formal outcome/behaviour control should be set up to govern the relation. When both dimensions are low, informal control is preferable, but when both measures are high, both outcome and behaviour control are suited control mechanisms (Das & Teng, 2001).

knowledge exploration, while the later phases, such as manufacturing, primarily aim at knowledge exploitation. On the other hand, research shows that the exploration of knowledge is best governed by informal controls, while knowledge exploitation is most adequately controlled by formal controls (Bijlsma-Frankema & Costa, 2005). Thus, based on the characteristics of high task programmability, high outcome measurability and knowledge exploitation goals, MSRs could be expected to be governed by primarily formal controls with little informal controls. In other words, the literature offers different management control designs for MSRs regarding the informal control level. Therefore, this study investigates how the MCS of MSRs is designed and how important informal controls are in that design, in particular in IORs between an original equipment manufacturer (OEM) and suppliers of outsourced manufacturing activities in the trend-setting automotive industry (cf Womack, Jones & Roos, 1990).

An automobile is a complex product manufactured with thousands of components. Consequently, also this industry increasingly outsourced non-core activities and started relying on suppliers to create lower costs. To that end, a variety of supply chain management practices has been implemented, such as lean supply and continuous improvement. Yet, these practices induce the need for appropriate management control structures and bi-directional communication to organize and manage the relation (Carr & Ng, 1995; Cooper & Slagmulder, 1999; Scannell et al., 2000). In that respect, one particular automaker, namely Toyota, is known for partnering with suppliers, transferring its expertise to help suppliers and installing softer forms of control including trust. To govern the search for continuous improvement in manufacturing, Toyota established the “Toyota Group” by means of a supplier association, an operations management consulting division and voluntary small group learning teams (Dyer & Nobeoka, 2000). Other automakers, however, govern this search by heavily formalized supplier relations. Contrary to cooperation during procurement and R&D, manufacturing is argued to become much more demanding towards suppliers. Automakers increasingly transfer manufacturing risk and supply responsibility to first-tier suppliers, which results in suppliers delivering to very tight just-in-time and in-sequence schedules (Alford, Sackett & Nelder, 2000). As a result, OEMs install formal controls and supplier improvement techniques, which alert suppliers to the importance of ameliorating supply performance at lower costs. Hence, also automotive practice shows evidence of high and low levels of informal control. Therefore, this study specifically investigates how the MCS of automotive MSRs is designed.

Yet, besides illustrating MCS design, this paper contributes to explaining MCS design of automotive MSRs. To our knowledge, little management control research specifically investigated contingency theory's explicative power in manufacturing. Naturally, several papers study influences on MCS design in manufacturing environments, like the impact of manufacturing flexibility (Abernethy & Lillis, 1995), customization and related interdependence (Bouwens & Abernethy, 2000), profit centre strategy (Lillis, 2002), production strategy and production technology (van Veen-Dirks, 2006). However, these studies investigate characteristics explaining MCS design in one organization. Consequently, the design of MCSs that govern different types of inter-organizational supplier relationships involved in the manufacturing of complex products (Gietzmann, 1996) remains under-explored. Therefore, more attention towards explaining this type of MCS design is called for (Cooper & Slagmulder, 2004; Langfield-Smith & Smith, 2003; van der Meer-Kooistra & Vosselman, 2006). This paper answers that call by tailoring contingency theory to the setting of MSRs. To that end, we propose a refined theoretical contingency framework based on recent inter-organizational management control theory, but specifically adapted for the manufacturing phase. This framework proposes several contingencies determining the level of risks, which are governed by different levels of management control techniques.

In order to illustrate the validity of the framework in practice and answer how and why automakers design their MCS, we perform an in-depth explanatory case study of the relations between a facility (VCG) of the international OEM Volvo Cars Corporation and a selection of its first-tier supplier facilities. The case study provides considerable evidence of three supplier types, namely batch, low value-added just-in-sequence and high value-added just-in-sequence suppliers, visualizing the associations in the framework between contingencies, risks and management controls. These controls include both formal and informal techniques, of which trust building and social pressure are highly valued. Most notably, VCG's structured supplier team functions as a clan and establishes informal control among participating suppliers, which strengthens control on the OEM's dyadic supplier relations. As our framework draws on case findings from other less formal IORs, our case findings offer more evidence of their external validity. That way, the findings contradict that informal controls play a minor role in automotive MSRs.

The remainder of this paper is organized as follows. In the second part, we develop the theoretical contingency framework. The third part describes the case research

methodology. The fourth part is the actual case study, which presents VCG, describes three supplier types by means of contingency levels and clarifies how VCG designed the MCS governing them. In the fifth part, we discuss our findings by comparing VCG's management control with previous findings and elaborating on the significance of VCG's supplier team. We conclude the paper with a summary of the main findings and some avenues for further research.

2. Theoretical framework

In this part, we develop a theoretical contingency framework for MCS design of MSRs, which can be found in figure 1.1.

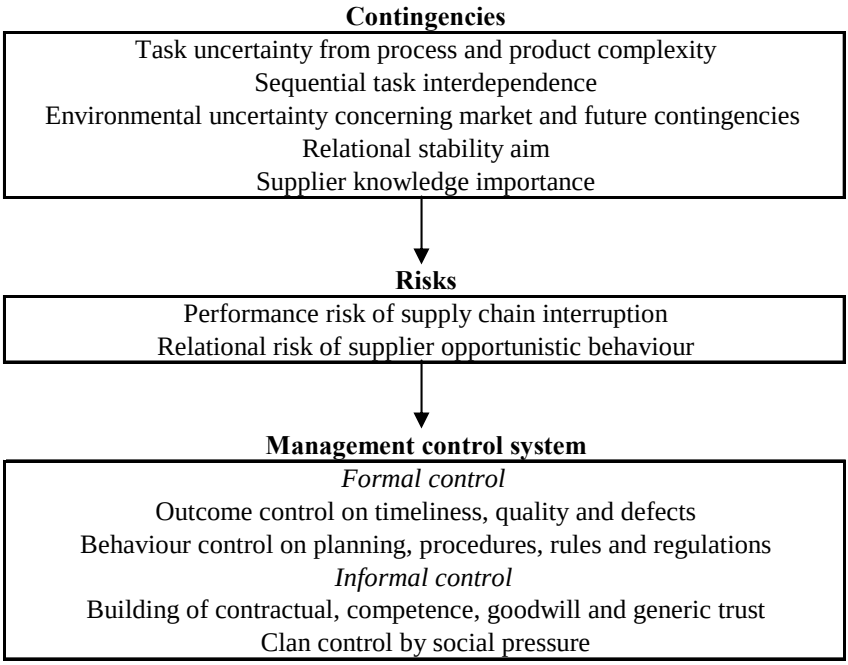

Figure 1.1: Theoretical contingency framework for MCS design of MSRs

Contingency theory originated with the aim of explaining the structure of organizations by particular circumstances. Later, management accounting researchers adopted and further developed the theory in order to explain the shape of MCSs in organizations (e.g. Chenhall, 2003; Luft & Shields, 2003). Therefore, contingency theory suits this study, regarding MCS design of MSRs and its explicative variables. The central

concept of the framework is the level of risk a certain MSR runs. Inter-organizational management control theory proposes two types of risk, which result from five different situational antecedents, characterizing the MSR. Although we clarify both risk types separately, we stress the integrative interpretation of all contingencies, jointly determining both levels of risk. Subsequently, this risk is governed by different management control instruments, either with a large or a small role for informal control.[3]

2.1. Performance risk

The first risk type is *performance risk*, defined as the probability of not achieving the MSR objectives, despite satisfactory cooperation (Das & Teng, 2001). This type of risk is also referred to as "coordination requirements" (Dekker, 2004; Gulati & Singh, 1998). As the MSR objective concerns manufacturing as many products of the order book as possible, on time, with good quality and at the lowest possible cost, performance risk is the risk of a supply chain interruption, disturbing the realisation of this goal. Three contingencies related to technology increase this risk, namely complexity, task uncertainty and task interdependence (Chenhall, 2003). Yet as complexity and task uncertainty are highly related (Chenhall, 2003), the framework does not include complexity separately (cf Dekker, 2004).

Task uncertainty refers to variability in transformation tasks and the available knowledge of methods for performing those tasks (Chenhall, 2003). This situational characteristic determines the measurability difficulty of output and activities (Kamminga & van der Meer-Kooistra, 2007; van der Meer-Kooistra & Vosselman, 2000), which increases with increasing levels of complexity of both the delivered product and its operational processes (Woodward, 1965). The first complexity is related to the added value of the product and gradually increases depending on whether the supplier delivers a standard component or an important customized module (Cooper & Slagmulder, 2004). The second

[3] According to van Veen-Dirks (2006), all situational characteristics and MCS characteristics are determined jointly instead of sequentially. Also Kamminga & van der Meer-Kooistra (2007) propose that the influence of contingencies is not determined by each antecedent as such, but by their interaction. In addition, they suggest studying control as an integrative concept, in which all control dimensions are incorporated. Consequently, we do not propose one-on-one associations between one specific contingency, one specific type of risk and one specific type of control, suggested to suit that risk type. Instead, our model simultaneously studies the associations between situational contingencies, risks and management control techniques.

complexity regards the added value of the production process and reflects the complexity of the supplier's manufacturing processes, needed to effectively produce and deliver the products as required.

Task interdependence relates to the degree to which subactivities of the value creation process have been split up and made dependent on each other (Dekker, 2004). In MSRs, this interdependence is sequential (Thompson, 1967)[4], because the relation involves transferring the supplier's output to the manufacturer's input process. The level of sequential interdependence is impacted by the dependence level of the manufacturer's operational performance on the supply quality (timeliness and product quality). Moreover, the interdependence level of a specific MSR is influenced by the production flexibility required from both parties and the manufacturer's lack of precise knowledge to perform activities previously done in-house.

2.2. Relational risk

The second type of risk is *relational risk*, implying the probability of not having satisfactory cooperation because of opportunistic behaviour of the supplier, exemplified in shirking, cheating, distorting information and appropriating resources (Das and Teng, 2001). This type of risk is also referred to as "appropriation concerns" (Dekker, 2004; Gulati & Singh, 1998). Transaction cost economics (TCE) theory[5] proposes three contingencies that influence relational risk and subsequently determine appropriate control: asset specificity, environmental uncertainty and transaction frequency (Williamson, 1979). Yet, as the manufacturer possesses no specific assets related to a certain supplier, at least not in the manufacturing phase of the supply chain, there is no lock-in to supplier opportunistic behaviour.[6] Hence, unlike uncertainty and transaction frequency, asset

[4] Thompson (1967) identifies three levels of task interdependence from low to high, which influence the level of inter-organizational coordination and communication: pooled, sequential and reciprocal interdependence.

[5] TCE argues that parties are only boundedly rational and behave opportunistically. Therefore, the total cost of outsourcing is the sum of both the supplied component costs and the transaction costs, including costs for negotiation, drawing up contracts, coordination, control and risk of opportunistic behaviour (van der Meer-Kooistra & Vosselman, 2000).

[6] Obviously, suppliers do have specific assets in place, rendering them vulnerable to opportunistic behaviour from the part of the manufacturer. However, this study and the developed theoretical framework only focus on supplier opportunistic behaviour.

specificity does not influence supplier opportunistic behaviour in MSRs and is not included in our theoretical framework.

Consistent with being a central contingency research variable, *environmental uncertainty* also forms a powerful characteristic of MSRs (Chenhall, 2003). In particular, this contingency relates to general market uncertainties and uncertainty about unknown future contingencies (Kamminga & van der Meer-Kooistra, 2007; Langfield-Smith & Smith, 2003; van der Meer-Kooistra & Vosselman, 2000). Because manufacturer and supplier interact under these uncertainties, both parties face changes over time, which require detailed contracts (Dekker, 2004). However, incomplete contract theory argues that there exist limitations in drawing up complete contracts, because all future contingencies can not be foreseen, are too expensive to foresee or are too expensive or impossible to contract upon (Gietzmann, 1996). Consequently, the combination of uncertainty and incomplete contracts leads to potential opportunistic behaviour of the supplier.

According to TCE, more frequent interactions lower the possibility of opportunistic behaviour (Williamson, 1979). So, to preserve a positive relation between contingencies and relational risk, we could utilize infrequency as contingency variable (e.g. Anderson & Dekker, 2005). Yet, as we study MSRs with no connection to commercial negotiations determining the contract term, we include the antecedent *relational stability aim*. This contingency relates to the manufacturer's aim of continued future interactions with the supplier and serves to build bilateral commitment (Cooper & Slagmulder, 2004). We argue that MSRs, in which relational stability is considered necessary and thus aspired by the manufacturer, are subject to higher relational risk. For example, if supplier switching costs are high due to high interdependence, high commitment from the manufacturer could incite the supplier to accept lower quality or delivery performance.

Besides including a transaction environment characteristic and a transaction characteristic, we also incorporate a transaction party characteristic (Langfield-Smith & Smith, 2003; van der Meer-Kooistra & Vosselman, 2000). In particular, we include *supplier knowledge importance*, which encompasses the degree of importance for the manufacturer to know the supplier and to be able to assess characteristics, such as trustworthiness and willingness to share proprietary knowledge. Usually, this kind of assessment is done by means of first-hand or second-hand experience. Hence, we argue that when the importance of supplier knowledge rises, the risk for insufficient or erroneous assessment and subsequent supplier opportunistic behaviour increases.

2.3. Management control system

Although MCSs have been conceptualised and categorised in various ways, the current management control literature has reached a consensus on two types of management controls, namely formal and informal control instruments (Langfield-Smith & Smith, 2003). Obviously, studying the usage of informal controls compared to formal controls requires both control types to be included in the theoretical framework.

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 the outcomes of operations against pre-defined outcomes or targets, by using several performance measurement techniques (Dekker, 2004; Merchant, 1998; Ouchi, 1979). The most important outcome metrics for MSRs are percentage of defects, quality of delivered goods and on time delivery of goods (Gunasekaran, Patel & McGaughey, 2004). *Behaviour controls* concern the specification and actual surveillance of behaviour by means of rules and standard procedures (Merchant, 1998; Ouchi, 1979). Additionally, behaviour controls include evaluating compliance with pre-specified planning, procedures, rules and regulations (Dekker, 2004).

Informal controls (also called social controls) are not explicitly designed, but are grown out of shared norms and values, shaped by frequent interaction, meetings and management attitude (Merchant, 1998; Ouchi, 1979). Especially *trust building*[7] has emerged as an important informal control instrument in inter-organizational MCSs (e.g. Dekker, 2004). While formal controls reduce risks by altering the incentives for underperformance or opportunism, trust building mitigates these risks by minimizing the fear of underperformance or opportunism to occur (Das and Teng 2001). Therefore, we include three types of inter-organizational trust building, namely building contractual trust, competence trust and goodwill trust (Sako, 1992).[8] Contractual trust results from previous

[7] Rousseau, Sitkin, Burt & Camerer (1998, p. 395) define trust as "a psychological state comprising the intention to accept vulnerability, based upon positive expectations of the intentions or behaviour of another". According to them "trust is not a *behaviour* (e.g. cooperation), or a *choice* (e.g. taking a risk), but an underlying *psychological condition* that can cause or result from such actions" (Rousseau et al., 1998, p. 395; italics added). As such, trust in itself can not be a control *instrument* in the MCS of MSRs. Instead, the control techniques are the *actions* the manufacturer performs to create and build trust in the supplier.

[8] 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

contractual relations or grows during the MSR (Sako, 1992). Competence trust is increased by previous good performance, i.e. good quality and delivery results. Moreover, competence trust results from buying products from reputable suppliers or transferring competences to the supplier. Additionally, product and/or process certification and process standardisation enhance competence trust (Sako, 1992). To develop goodwill trust, Sako (1992) identifies shared values and norms as necessary, but insufficient, because transaction parties also need to show the willingness to be indebted to each other. Gulati (1995) stresses creating and growing an inter-organizational bond of friendship to trigger goodwill trust (Gulati, 1995). Other possible goodwill trust initiators are interactive goal setting, trustworthiness reputation and a long term relationship (Dekker, 2004). Next to these specific trust building mechanisms, the literature also proposes an important generic trust building technique, namely close interaction based on mutual interests and established by means of joint decision making and joint problem solving via a joint relationship board and/or joint task groups (Das & Teng, 2001; Dekker, 2004).[9]

Besides trust building, MSRs can be governed by another type of informal control, which Ouchi (1979) refers to as *clan control.* Based on shared norms, values and a common inter-organizational goal, supplier behaviour in the interest of the MSR will be reinforced, because suppliers are motivated to achieve the goal (Das & Teng, 2001). This incentive results from inter-organizational *social pressure* (Speklé, 2001) exerted by the manufacturer, which we believe is social control in its literal meaning. Because of high interdependence between manufacturer and supplier, below standard results of the supplier directly impact the manufacturer's performance. Consequently, supplier management is unpleasantly confronted with manufacturer management and faces personal humiliation because of the error. Additionally, supplier management runs the risk of their reputation

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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).

[9] Other potential generic trust building techniques in a MSR are communication via regular inter-organizational meetings (Chalos & O'Connor, 2004; Das & Teng, 2001), information sharing of problem areas (Chalos & O'Connor, 2004), supplier development activities (Carr & Ng, 1995), networking (Das & Teng, 2001), training (Chalos & O'Connor, 2004) and the extent to which the employees of both parties understand the factors ensuring the collaboration's future success (Chalos & O'Connor, 2004).

and personal relationship with interacting manufacturer management getting injured. Also Dyer & Singh (1998) mention reputation and personal relations as social control mechanisms, besides norms and trust. By acting as negatively valued social sanctions (Bijlsma-Frankema & Costa, 2005), these social consequences create incentives for satisfactory supplier performance and render supplier underperformance and opportunism hard to sustain (Speklé, 2001). If we assume operational snags to be day-to-day business in MSRs, this social pressure creates an informal means to mitigate risk in MSRs.

3. Research methodology

3.1. Case study research

The empirical part of this paper is based on an in-depth case study, which is an investigation of a real life phenomenon, relying on multiple sources of evidence and benefiting from prior development of theoretical propositions (Yin, 2003). An explanatory case study suits our research that concerns refining existing inter-organizational management control theory for the relatively under-explored manufacturing phase of the supply chain.[10] According to Keating (1995), such theory refinement needs a clear theoretical starting point, supplemented with openness to the discovery of unexpected findings. To balance these *theory attachment* and *detachment* requirements, we developed a theoretical framework to guide the data collection, but at the same time used data collection techniques allowing sufficient openness. Based on the data, we assessed the explanatory power of the theoretical framework.

Furthermore, several inter-organizational management control case studies (e.g. Cooper & Slagmulder, 2004; Dekker, 2004; Kamminga & van der Meer-Kooistra, 2007;

[10] More specifically, our research corresponds to investigating a complex phenomenon within its real life context, of which empirical evidence is rather limited, and answering how and why questions about this phenomenon, for which an explanatory case study design is most suited (Eisenhardt, 1989; Yin, 2003). Furthermore, our *theory refinement* goal represents the middle ground between *theory discovery*, i.e. describing novel phenomena, and *theory refutation*, i.e. disconfirming well specified theories by bringing in negative evidence (Keating, 1995). More specifically, our case research is of the *theory illustration* type, documenting "previously unappreciated aspects of management accounting practice" and identifying "aspects of the illustrated theory that require reformulation or more rigorous specification" (Keating, 1995, p. 71). Indeed, the goal of this study is to illustrate how manufacturers design supplier MCSs, how important informal controls are in that design and how the design can be explained by means of a specifically adapted theoretical framework.

Nicholson et al., 2006) strengthen the argument that cases allow investigating in detail the structure and influencing variables of IORs (Sartorius & Kirsten, 2005). These studies demonstrate that MCS design can be adequately investigated by means of qualitative research. The social meaning of inter-organizational MCSs, especially regarding the use and interpretation of informal controls, and the subsequent behaviour of companies and employees is very complex. Therefore, an in-depth study is needed to discover how different parties interpret certain IORs and whether the MCS is designed accordingly. 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).

Like most inter-organizational studies, the unit of analysis consists of dyadic relationships 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. In order to answer the proposed research questions concerning MSR MCS design, we analyzed all relations after the manufacturer had decided to outsource the manufacturing activities. In other words, we addressed neither the make-or-buy decision nor related commercial negotiations, but collected data from the start of production onwards. Furthermore, we only gathered data on standard MCSs for MSRs with good operational performance.

3.2. Case company selection

The selection of the case company and its suppliers was influenced by two selection concerns: theoretical sampling (Eisenhardt, 1989) and open and flexible access to senior management. Based on these concerns, we chose the Volvo Cars Gent (VCG) production facility of the Swedish Volvo Cars Corporation as manufacturing case company. On the one hand, VCG was chosen because exploratory interviews learned that the OEM is considered a "best practice"[11] by financial analysts, suppliers and umbrella organizations.

[11] VCG is financially healthy, operationally profitable and highly appraised in the international automotive sector. Additionally, VCG's supply is evaluated one of the best in automotive benchmark studies. Furthermore, VCC and in particular VCG are positively evaluated by suppliers regarding their approach towards them. Finally, also

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). On the other hand, VCG management showed remarkable openness, interest in the research topic and willingness to cooperate. Obviously, the selection of case suppliers was based on the same selection concerns. Taking into account differences found at VCG and discussions with VCG management about supplier appropriateness (i.e. theoretical sampling) and participation willingness, eight VCG supplier manufacturing facilities were chosen. This way, we were able to investigate VCG's MCS of different MSRs, with data from both parties.

3.3. Data collection

The main data gathering technique consisted of 26 semi-structured interviews with high level managers of both VCG and the selected suppliers. These interviews were held in three rounds between February 2006 and October 2006. Hence, the validity of the observations described in this paper relates to that period. 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. Next, we interviewed supplier managers, in particular plant managers or VCG responsibles. Finally, we re-interviewed specific VCG managers most involved with suppliers spoken to in round two. Table 1.1 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.

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umbrella organizations, able to compare their members' different supplier relationship approaches, are in favour of VCG's MSRs.

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	3	55; 62; 58	10/02/2006; 29/05/2006; 13/10/2006
	Logistic Engineering Manager	1	68	10/02/2006
	Supplier Support & Purchasing Manager	3	92; 95; 98	15/02/2006; 18/04/2006; 29/05/2006
	Material Planning Manager	1	73	15/02/2006
	Supplier Quality Assurance Manager	3	44; 96; 67	15/02/2006; 29/05/2006; 13/10/2006
	Human Resource Manager	1	50	15/02/2006
	Finance Manager	1	47	15/02/2006
	IT Manager	1	67	13/03/2006
HVA JIS (1)	Plant Manager	2	106; 74	13/03/2006; 18/04/2006
	Human Resource Manager	1	51	29/03/2006
	Quality Manager	1	125	29/03/2006
HVA JIS (2)	Plant Manager	1	164	30/03/2006
HVA JIS (3)	Plant Manager	1	102	3/05/2006
HVA JIS (4)	Plant Manager	1	116	10/10/2006
LVA JIS (1)	Plant Manager	1	68	24/05/2006
LVA JIS (2)	Plant Manager	1	121	6/10/2006
Batch (1)	Commercial Service & Quality Manager	1	61	27/09/2006
Batch (2)	Customer Service Manager & VCG Account Manager	1 (joint)	73	27/10/2006

Table 1.1: Interview data summary

The interviews aimed at building a trusting relationship 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 and tailored to fit the interviewee's organization and responsibility (cf appendix for a general interview protocol of interview rounds two and three). 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 three hours, with an average duration of approximately one hour and a half. Afterwards, all taped interviews were transcribed and sent back to the interviewees for feedback and final approval. This feedback was subsequently transcribed as well. Interview transcripts were written in prose, as to avoid offending interviewees by literally transcribing their words on a 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 document and all interpretations made during transcribing.

Finally, we supplemented the interview data with archival research of internal and public data, such as company presentations, meeting minutes, supplier performance data, supplier syllabi, annual reports and news articles. These archival data allowed triangulating different findings from different methods, rendering conclusions more reliable and convincing (Yin, 2003).

3.4. 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. 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 utilised in order to capture facts and findings coming up during the analysis. As with interviews, these tapes were subsequently transcribed and further studied. Finally, this second analysis resulted in an elaborate document, containing coded transcript extracts

related to the theoretical constructs found in the data. Together with the rich collection of original data, this document was used for writing up the case study and discussing its findings. Both case study and discussion were approved for publication by VCG, without having to make changes.

Due to lack of space, the following case study only describes our findings in terms of the framework, so without direct reference to the rich set of unique case data. Yet, to indicate the origin of this description, we grouped some exemplary interview quotes in three tables provided in the next part.

4. Case study: Volvo Cars Gent

4.1. Case company description

Volvo Cars Gent (VCG) is the largest manufacturing unit of Volvo Cars Corporation (VCC), a Swedish automotive OEM owned by Ford Motor Company. In 2005, this company employed 5.025 people, had a turnover of about €4,2 billion and produced 258.479 cars. The production was spread over four Volvo models, namely the S40, V50, S60 and V70. All models are built on only one assembly line, which requires ultimate flexibility of all assembly processes. Production starts in the welding factory, where pressed steel plates from Volvo's press factories are welded together into a car body. In the paint shop, welded bodyworks are provided with various paint and protective coatings. During final assembly, the painted bodywork becomes a car with fitted interior elements, such as seats, and mechanical components, like suspensions. The relations with suppliers of these products for final assembly are this study's subject.

Similar to other OEMs, production philosophy at VCG evolved from *push* (i.e. build-to-stock), to *pull* (i.e. build-to-order). Yet, this new approach created both an explosion of possible cars, for which stocking all components was physically and financially impossible, and the possibility for customers to make very late order changes. Hence, VCG needed flexible manufacturing and ordering, and outsourcing of manufacturing activities to reliable suppliers. By 2003, 20 suppliers delivered 78% of total material volume and 77% of total material value. These suppliers set up shop in VCG's neighbourhood in order to reduce transport costs and facilitate fast problem solving. Moreover, most suppliers jointly work in a *supply-in-line-sequence centre*, i.e. a supplier park, operated by a logistic provider and located five kilometres from VCG, which offers

advantages such as limited overhead costs, competence sharing and joint transport. The most important advantage of local supply, however, is the possibility for suppliers to produce and deliver components both “just-in-time” (JIT), i.e. when the car for which the components are intended has come on VCG’s production line, and “in-sequence”, i.e. in the same order as the cars on VCG’s production line.

Because of local supply’s strategic importance in making *just-in-sequence* (JIS) supply feasible, VCG set up the *Suppliers Team Volvo Cars* (STVC) to exchange information with JIS suppliers. The purposes of the STVC are creating openness and sharing competencies by the exchange of real life experiences in order to improve manufacturing. To this end, all supplier plant managers attend a monthly STVC meeting in order to get to know each other, exchange VCG information (VCG planning, Volvo sales, automotive trends, etc.), jointly consider common problems and improvement programs, and set up and follow up on specific workgroup projects. Examples of common improvements are jointly buying electricity and increasing supplier park safety. Under the overall STVC, of which the chairman is a supplier plant manager, five inter-organizational workgroups exist, namely for quality, logistics, HR, IT and finance. Workgroup participants meet monthly at one of the supplier facilities to visit the company and discuss problems and improvements. Examples of discussion themes are correct sequencing, milk rounds, employee absenteeism, a monitoring and back-up procedure test of EDI communication and automatic invoicing.

4.2. Management control system of supplier relationships

Our data contain substantial evidence of three supplier types in manufacturing that are characterized by different contingency levels, namely *batch* suppliers, *low value-added* (LVA) *just-in-sequence* (JIS) suppliers and *high value-added* (HVA) *just-in-sequence* (JIS) suppliers. In order to better understand how risk is influenced by the contingencies, we first clarify VCG’s performance and relational risk. Then, we discuss the contingencies one by one, before indicating how the resulting risk level is governed by both formal and informal management controls. A summary of the results can be found in figure 1.2.

	Suppliers		
	Batch	**LVA JIS**	**HVA JIS**
Contingencies			
Process complexity	batch	low value-added just-in-sequence	high value-added just-in-sequence
Product complexity	standard components	customized components	customized modules
Performance dependence	partially	entirely	entirely
Flexibility requirements	low	high	high
Process knowledge asymmetry	depends	low	high
Supplier dependence on fluctuating demand	partially	entirely	entirely
Impact of unknown future contingencies	low	high	high
Relational stability aim	medium	high	very high
Supplier knowledge importance	little supplier knowledge	good plant manager knowledge	good plant manager and middle manager knowledge
Risks			
Performance risk of supply chain interruption	low	medium	high
Relational risk of supplier opportunistic behaviour	low	medium	high
Management control system			
Outcome control			
Quality KPIs	PPM	PPM; audit remarks	PPM; audit remarks
Logistics KPIs	MPs; line stop minutes; dropped cars; delivery precision	MPs; line stop minutes; dropped cars	MPs; line stop minutes; dropped cars
Specific audit remark targets	no	no	yes
Quality off-target response time	no response, unless severe snag	daily	daily
Logistics off-target response time	depending on stock level	daily	daily
Quality KPI follow-up	no response, unless severe snag	monthly	monthly
Logistics KPI follow-up	daily	daily	daily
Technical quality report penalty	predefined; non-negotiable	none	none
Line stop penalty	predefined; non-negotiable	tailor made; negotiable	tailor made; negotiable
Behaviour control			
Syllabus	none	basic routines	basic routines; specialized extensions
Supplier quality follow-up	none, unless severe snag	weekly, unless snag	daily
Supplier logistics follow-up (workload score)	2, 5 or 10	2 or 5	10
Supplier company visits	none, unless severe snag	monthly	weekly
Open information sharing	none	limited	extensive
Trust building			
Specific trust building			
Contractual trust building	high	high	high
Competence trust building	medium	high	very high
Goodwill trust building	medium	high	very high
Generic trust building via STVC			
Global STVC / STVC workgroup attendance	no member	52% / 43%	69% / 68%
STVC workgroup contribution	no member	low to medium	high
Social pressure			
Supplier interaction for problem solving	seldom	often	daily
Global STVC / STVC workgroup attendance	no member	52% / 43%	69% / 68%

Figure 1.2: MCS design of MSRs at VCG

4.2.1. Risks

In MSRs, risk relates to potential problems concerning manufacturing and supporting processes like logistics and IT. In that respect, VCG is most concerned with the performance risk of a MSR, which is the probability that such an operational snag occurs in the supplier's production or logistics processes and disturbs supply chain continuity and VCG manufacturing. In other words, performance risk is the risk that a supplier is not capable of keeping the promise of delivering the right goods of the right quality at the right time. Based on the levels of task uncertainty and task interdependence, we find performance risk of batch suppliers to be lower than the risk of LVA JIS suppliers. The level of this latter risk, in turn, is lower than the HVA JIS suppliers' risk.

Relational risk in the MSR regards the probability of supplier opportunistic behaviour. VCG considers this risk type to be the risk that (even potential) operational snags are not openly communicated or minimized, so that problem solving time is lost and the problem escalates. Additionally, shirking one's responsibility in case of a snag is a second appropriation concern for VCG managers. Although the first opportunism type damages VCG manufacturing most, also the second type results in worthless discussions, seriously hampering manufacturer-supplier interaction. By studying environmental uncertainty, relational stability aim and supplier knowledge importance, we find a similar ordering for relational risk, namely lowest for batch suppliers, highest for HVA JIS suppliers and somewhere in between for LVA JIS suppliers.

4.2.2. Contingencies

VCG and supplier management refer to process and product complexity to differentiate between supplier types. Batch suppliers deliver products in large quantities on a regular basis from facilities all over the world. JIS suppliers are located in the neighbourhood of VCG and deliver just-in-time and in-sequence, which is much more complex. Although many batch suppliers deliver simple parts, like plastic pieces, some batch suppliers deliver more complex products, such as electronic devices. However, all batch suppliers deliver standard components, which are not called off for a specific car. LVA JIS suppliers, however, deliver customized components. Their manufacturing activities are low value-added, because they primarily aim at variant creation, after which all parts are sequenced and delivered just-in-time. Supplying back shelves is a good LVA example, because

manufacturing stays limited to punching holes for speakers. Concerning delivery, HVA JIS suppliers are comparable to LVA JIS suppliers. Yet, these suppliers assemble modules such as car seats, so that their processes add considerably more value. To that end, HVA JIS suppliers operate large facilities with many employees engaged in complex processes. Furthermore, modules like dashboards are characterized by lower output measurability compared to batch and LVA JIS products, which results in extra difficulties in case of unsatisfactory quality. Because HVA JIS suppliers deliver the most complex modules by means of the most complex production and supply system, performance risk is highest.

Because of just-in-sequence delivery, the interdependence between JIS suppliers and VCG is high; or at least considerably *higher* than between VCG and batch suppliers. All JIS suppliers work in harmony with VCG like the cogwheels of a watch, because if one supplier disturbs the continuous delivery flow, not only VCG but also other JIS suppliers suffer. Severe supply problems stop VCG's assembly line, producing a car every 61 seconds. As all JIS suppliers exclusively deliver VCG and only receive EDI orders during running production, their production will inevitably suffer (in the worst case stop) as well. Hence, VCG's and JIS suppliers' performance entirely depends on the performance of all JIS suppliers. Additionally, JIS suppliers must be highly flexible because of pull production and heavily fluctuating automotive demand (cf environmental uncertainty). Furthermore, HVA JIS suppliers operate complex processes, which are more *core competences* than the variant creation processes of LVA JIS suppliers. Consequently, VCG lacks sufficient knowledge to effectively and efficiently perform these HVA activities.

The automotive industry probably experiences its highest competitive level ever. According to all parties involved, environmental uncertainty has become the new standard. Hence, VCG's JIS suppliers' market uncertainty is high, because their performance completely depends on Volvo's market demand, which sometimes heavily fluctuates. In addition, there are two unknown future contingencies, substantially impacting the relation with JIS suppliers. On the one hand, VCG continuously bears the risk of being closed down by its mother company VCC/Ford in case of a performance decrease. On the other hand, the VCC/Ford purchase department can always decide not to resource the current supplier. Consequently, both VCG and suppliers continuously need to prove themselves towards their mothers, who benchmark them against their colleague facilities. This competition between colleagues increases environmental uncertainty to stimulate continuous improvement. As a result, VCG needs to safeguard its high performance level at all times

and needs suppliers not to behave opportunistically. Suppliers, however, face similar performance pressure from their own mother companies. Because of that, they are tempted to hide operational snags from VCG and try to solve problems themselves in order to prevent their negative performance from being noticed and registered. In other words, environmental uncertainty is a very important contingency influencing relational risk. Although also batch suppliers face these environmental uncertainties, their impact is much smaller, because the effect from VCG is mitigated by supplying other automotive OEMs and other industries.

VCG generally cooperates with suppliers and helps them facing problems. VCG truly strives for long term relational stability, because the OEM is aware that the interdependence, which is higher with JIS suppliers, considerably impacts performance. To put it simply, if the supplier is in trouble, VCG is in trouble as well. So, as all JIS suppliers need to work in utmost harmony with VCG, the OEM prefers stable over changing MSRs, even when they are underperforming for a long time. VCG beliefs that assisting suppliers minimizes the possibility of (further) damage to VCG's production. Consequently, JIS suppliers receive much bilateral cooperation to solve problems quickly. The location of most JIS suppliers in the supplier park provides opportunities for such problem solving and process ameliorations. Although VCG also assists batch suppliers in severe problems, the OEM values stability most for HVA JIS suppliers, as their interdependence is highest. Obviously, this attitude makes VCG more vulnerable to opportunistic behaviour from HVA JIS suppliers. As these suppliers know VCG strives for relational stability, their fear for retaliation, resulting from disclosed opportunism, is lower.

Finally, our data show that VCG managers value good supplier knowledge most in case of HVA JIS suppliers. Yet, this does not mean that VCG assesses JIS supplier's competence reputation on a firm level basis. That is the responsibility of the VCC/Ford purchase department during supplier selection. Instead, VCG evaluates suppliers on a person level basis and gathers information about supplier plant managers, concerning trustworthiness and willingness to share proprietary knowledge. These managers play a central role in the MSR, as they need to guarantee good performance by interacting with several parties involved, including VCG management, supplier mother company management and supplier employees. The importance of VCG's plant manager knowledge is exemplified by the fact that VCG not only follows their appointment from close by, but also suggests appropriate candidates to supplier mother companies. For HVA JIS suppliers,

with a larger management staff than LVA JIS suppliers, the same importance is given to partner knowledge of middle management. For example, if a supplier quality manager appears unwilling to share proprietary information concerning quality (problems), VCG's interacting quality manager will highlight this personal attitude by escalating the supplier to step two of the escalating activities procedure[12], even when no substantial quality problems have occurred. This reflects the considerable impact of this contingency on VCG's relational risk with HVA JIS suppliers. It speaks for itself that VCG is not interested in the plant manager of batch suppliers. In most cases, especially when the supplier's facility is located abroad, VCG managers do not even know who actually leads the plant.

Exemplary interview quotes concerning VCG's MSR contingencies and risks can be found in table 1.2.[13]

[12] The escalating activities procedure is a VCG procedure used to escalate suppliers experiencing operational difficulties. The aim is to indicate both internally (at VCG and VCC) and externally (to the supplier) that VCG is aware of the problems 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. Standard, all JIS suppliers are in step one, while batch suppliers are in step zero. 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 (zero for batch).

[13] When interviewees refer to "Volvo", they actually mean "Volvo Cars Gent" or (as we put it in the text) "VCG".

Theoretical variables	Interview Quotes (Source)
Contingencies	
Process complexity	Sometimes, both groups of suppliers [LVA and HVA JIS] are called in the same breath, but actually one should not do that. A supplier that only puts parts in the right order is incomparable to a supplier with a much more complex process that assembles all sorts of parts in the right way. (HVA JIS supplier)
Product complexity	Subsequently, there is a further partition on the basis of the product. Those suppliers that really deliver a serious added value also have a process in which all sorts of things can go wrong, and are distinguishable from suppliers that add less value to the product and also possess almost no production process in Gent. (VCG)
Performance dependence	If Volvo is stopped for two hours or for an entire shift, no batch supplier suffers from that. All call-offs are send as usual. JIS suppliers, however, are stopped as well. (VCG)
Flexibility requirements	The STVC is set up with JIS suppliers around Volvo that are very sensitive to changes. A day of economic unemployment, one minute stoppage of the assembly line or one overtime hour at Volvo has consequences for the production at those suppliers. (VCG)
Process knowledge asymmetry	Volvo has transferred her [HVA JIS product] knowledge to our [HVA JIS supplier] employees step by step, until the point when our people had more experience than the people of Volvo. (HVA JIS supplier)
Supplier dependence on fluctuating demand	There is a total excess capacity of cars, as a result of which manufacturers are much more flexible towards the market. When the market demands something else than planned, they will listen to it. As a result, the capacity planning compared to the real orders is suddenly completely wrong, so that other amounts of components are needed, which suppliers completely did not expect. (VCG)
Impact of unknown future contingencies	In principle, JIS suppliers are certain about their contract for the life time of the current product. They are never certain about the next model. […] Volvo must fight as well and be the best to get the new [car] model to Gent. […] It is possible that the current supplier loses the battle and is switched. Everything is possible. The supplier must continuously prove being worth JIS supplier of Volvo. […] Also Volvo must continuously work and prove to be the best. The same holds for the suppliers. (VCG)
Relational stability aim	We do not want to change suppliers, because then we must completely start over the relationship with the supplier, which costs much time and thus money. […] In case of a problem, the supplier is first helped and not immediately subject for replacement. Only when the supplier is really of ill will or really unable or unauthorized to solve the problem, we go to the market. (VCG)
Supplier knowledge importance	We [HVA JIS supplier] have the advantage to be built up with people coming from the Volvo organization. Those employees know plenty of people at Volvo. […] On all levels, also team leaders on the shop floor, people communicate very informally. (HVA JIS supplier)
Risks	
Performance risk	In a [HVA] JIS environment, with two thousand parts coming from Japan, Mexico, China and everywhere in Europe, one can expect problems. The typical problems are quality issues and machine breakages. (HVA JIS supplier)

Relational risk	The suppliers brought all hands on deck in the hope of solving the problem in time, without the customer feeling a thing. The suppliers took a risk and if they succeeded, it was ok. If not, we stopped or received bad products. (VCG)

Table 1.2: Exemplary interview quotes concerning VCG's MSR contingencies and risks

4.2.3. Management control system

4.2.3.1. Outcome control

All VCG suppliers are subject to considerable outcome controls, more specifically in the form of *key performance indicators* (KPIs). These KPIs make up VCG's standard outcome control for suppliers not involved in VCG's escalating activities procedure. Undoubtedly, the most important KPI in automotive, and thus at VCG, is *parts-per-million* (PPM), indicating how many parts delivered do not comply with the agreed upon 100% quality specifications out of one million parts delivered. Additionally, JIS suppliers' quality performance is assessed by *car audit remarks*[14], for which the most complex HVA products, like car seats and dashboards, receive specific audit demerit targets. It speaks for itself that own targets result in a higher level of outcome monitoring and evaluating, which is confirmed by the quality manager, who indicates that problem response time is shortest for HVA JIS suppliers. Other important KPIs are related to logistics. The first one, *number of missing parts* (MPs), measures the number of parts that did not arrive at VCG in time and/or in the correct sequence. The second indicator, *line stop minutes*, registers the number of minutes that a supplier caused stoppage of the VCG production line. Third, *dropped cars* are cars dropped from VCG's line planning, because the supplier is unable to deliver the requested part.[15] Finally, batch suppliers are subject to a *delivery precision* registration, measuring the amount and timeliness of deliveries.

VCG emphasizes uniformity in measuring supplier performance based on the most important KPIs, which are PPM, MPs and lines stop minutes. However, our data still show a substantial difference between batch and JIS suppliers; not in the KPIs utilized, but in the management process behind the KPIs, which is more complex for JIS suppliers. First, the response time in case of deviation from target is much shorter for JIS suppliers. Second, the

[14] Every day, five to eight finished cars are audited by VCG personnel, who report negative audit remarks of four types: B10, B30, A70 and S300. The number behind the type of remark is the number of demerit points associated to the identified deficiency, which reflects the seriousness of the found demerit. In that respect, VCG targets an average of 35 demerits per car.

[15] Obviously, delivering missing parts by incorrect sequencing is only possible for JIS suppliers. Similarly, line stops and dropped cars can only be caused by suppliers delivering parts without which a car can not be further assembled.

PPM rate of JIS suppliers is followed-up monthly, while the PPM rate of batch suppliers is only taken into consideration in case of a severe operational snag. Furthermore, the penalty procedure is more straightforward for batch suppliers. Contrary to JIS suppliers, batch suppliers receive a pre-defined financial penalty for technical quality problems. Also line stop minutes are responded to more severely when caused by batch suppliers, who receive an invoice that covers VCG losses and costs. Such penalties for JIS supplier are always negotiable and the compensation demand decision is tailor-made. Apparently, VCG is aware of the higher complexity and flexibility of JIS suppliers and takes that into account for evaluation.

4.2.3.2. Behaviour control

VCG's most important behaviour control on JIS suppliers is certainly the syllabus. This document contains all agreements regarding the basic routines of day-to-day operational business, for example how the product should be transported and how EDI communication should be controlled. Especially in case of operational snags, the syllabus prescribes which actions should be taken, including who to notify and how to prevent the problem from escalating. For example, if the supplier is unable to load trucks as required, he should arrange a rush transport. Also when the EDI system breaks down, the supplier should follow the back-up routines prescribed in the syllabus. Additionally, the syllabus contains the requirement to hold the necessary certifications, including ISO-TS. Reflecting their larger process complexity, HVA JIS suppliers' syllabi contain specialized extensions compared to the ones of LVA JIS suppliers. As batch supplier relations are not as risky as JIS relations, VCG does not draw up syllabi with batch suppliers.[16]

Also supplier follow-up substantially differs between supplier types. Clearly, HVA JIS suppliers are most intensively followed up, because VCG quality and logistic engineers monitor suppliers and solve operational problems on a daily basis. The fact that VCG's logistics department is organized by a workload score, in which HVA JIS suppliers receive a standard ten points and LVA JIS suppliers only two or five, exemplifies the difference.

[16] Moreover, because such local operational agreements can not be negotiated by the VCC/Ford purchase department, the syllabus is entirely set up by VCG and the suppliers. Hence, although both parties sign the document and engage themselves in complying with the agreed terms, the syllabus is not part of the target agreement with the supplier, which renders it legally unenforceable.

Furthermore, HVA JIS suppliers are visited weekly or two times per week, while LVA JIS suppliers are only visited monthly or once every couple of months. When nothing disturbs the delivery flow from these suppliers, VCG feels no need to control their behaviour. The same approach holds for HVA JIS suppliers, of which the ones without substantial problems in the recent past are visited considerably less, but never less than once a month. Undoubtedly, batch suppliers receive lowest follow-up by VCG. VCG only deals with batch suppliers and visits their facility in case of a severe operational snag that the supplier does not get solved. Nevertheless, these batch supplier visits remain rather exceptional.

During supplier follow-up and supplier company visits, VCG expects JIS suppliers to openly share information in order to achieve efficient cooperative problem solving. These suppliers are asked to document operational processes, control systems and related problems, because JIS supply is impossible without information sharing. As VCG and JIS suppliers are highly mutually dependent, any type of restraint towards opening up own processes unnecessarily hinders the MSR. In order to explicitly stimulate such information sharing, VCG installed the STVC, currently led by the credo “Dare to Share!”. As VCG wants to set a good example, the OEM shares a considerable amount of information, depending on the level of interdependence. JIS suppliers are informed regularly on issues affecting VCG’s and thus the suppliers’ production; not only on the operational, but also on the strategic level. The actual level of information sharing is more extensive with HVA JIS suppliers, although mother company characteristics further differentiate suppliers. As batch suppliers are not affected by operational changes (e.g. line speed changes), they do not receive operational information. Also strategic information, like sales expectations and hence future production volumes, is not shared with batch suppliers, as their production schedule is far less dependent on that of VCG alone.

Exemplary interview quotes regarding VCG’s formal management controls can be found in table 1.3.

Theoretical variables	Interview Quotes (Source)
Outcome control	
Quality KPIs	The most important KPIs for quality are PPM and external audit remarks. Yet, the latter KPI is not monitored for batch suppliers. (VCG)
Logistics KPIs	I use three formal KPIs: missing parts, line stop minutes and service level or delivery precision, of which the first two are the most important and followed up for both batch and JIS suppliers. The latter is only monitored for batch suppliers. […] The list of reports also contains dropped car reports. (VCG)
Specific audit remark targets	Concerning audit remarks, specific audit remark targets are only set for high impact high value-added suppliers, which are followed up in an Excel file. (VCG)
Quality off-target response time	Surely, I will respond faster for high value-added suppliers than low value-added suppliers, when a negative trend arises. I notice that because of the relation that we have with the supplier and the daily cooperation. (VCG)
Logistics off-target response time	For JIS suppliers, we play the ball shortly, because we do not have stock for those suppliers' products. For batch suppliers, there usually is stock for one and a half to two weeks. Only when the stock level drops and the [batch] supplier is unable to deliver, we respond. (VCG)
Quality KPI follow-up	Every month, a 4Q report arrives in my mailbox from all JIS suppliers. (VCG)
Logistics KPI follow-up	We run daily queries for delivery precision, which are send to the suppliers via e-mail. Also line stoppages and the number of dropped cars are monitored daily. Finally, the number of missing parts is automatically sent as a report to the supply chain controllers every 24 hours. That approach is the same for all suppliers. (VCG)
Technical quality report penalty	Concerning technical reports, suppliers of sequential parts are not charged for a technical failure. In case of batch suppliers, four man hours are always charged. (VCG)
Line stop penalty	Big line stoppages are always discussed with the supplier and billed depending on the situation. […] Whether invoices for line stoppages are actually send, is a tailor made decision. That's why my department keeps those data. When it concerns a once-only incident at a certain supplier, Volvo has to be realistic. However, when the line stoppages are continuously and latently present in the data, it becomes another story. […] Batch suppliers are treated stricter than JIS suppliers with respect to penalties. The fact that Volvo can cause stoppage at JIS suppliers as well plays a part in the assessment of sending penalties. (VCG)
Behaviour control	
Syllabus	The syllabus is the golden handbook, with a mutual fine-tuning of procedures and what to do in case of problems. […] The syllabus is not part of the target agreement, but has to be fine-tuned and is therefore considered to be a binding agreement. (VCG)
Supplier quality follow-up	For batch suppliers, there is no supplier follow-up, unless there is a large problem, which does not get solved. […] We are continuously working on high value-added JIS suppliers, every day. Also with low value-added JIS suppliers, we are very busy; but less and only when something comes up. […] When nothing goes wrong, we let those suppliers do as they please. (VCG)

Supplier logistics follow-up	My department uses a point system in which every supplier receives two, five or ten points, depending on the work load for the controller. […] [HVA] JIS suppliers with a heavy process and high added value always get ten points, because we know that we experience difficulties with them once every while. (VCG)
Supplier company visits	My controllers only visit suppliers when there are problems and that is more often the case with larger [HVA] JIS suppliers than with [LVA] suppliers that only sequence. I guess that about once a week somebody visits those [HVA JIS] suppliers, while pure sequential [LVA JIS] suppliers are never visited more than once a month. (VCG)
Open information sharing	Apart from the electronic data, Volvo has asked the [HVA JIS] supplier permission to visit the shop floor regarding the difficulties. There, Volvo has looked at the working instructions of the operators. […] Next to that, also control instructions were inspected. […] Also the follow-up of how many good and bad parts every shift produced was investigated. (VCG)
	Openness and whole-hearted talking to each other is not easy, but I still try to cultivate it within the STVC. I want suppliers to be open and to learn from each other, without them thinking of the competitiveness at higher levels in their companies. […] This attitude is reflected in the slogan of the STVC: "Dare to Share!". […] In the forum for quality managers, I try to be as open as possible and share general information concerning Volvo as much as possible. […] By being open myself, I receive much openness and information back from the supplier. (VCG)

Table 1.3: Exemplary interview quotes concerning VCG's formal management controls

4.2.3.3. Informal controls

Trust building

Contractual trust building

Contractual trust constitutes the basic type of trust in VCG's MSRs. VCG managers indicate they at least need to be able to trust their suppliers to execute agreements made. If VCG discusses process changes, improvements or problem solutions and a decision is made, the OEM always trusts the supplier to comply with the agreement, even when oral promises are not put on paper. Consequently, our data show that the level of this type of trust building does not differ between batch, LVA JIS and HVA JIS suppliers. VCG trusts all suppliers to act as agreed upon and continuously builds this trust on positive experiences.

Moreover, VCG stresses that without this trust, collaboration with a particular supplier manager becomes impossible. Indeed, interviewees indicate that this kind of trust is rather inter-personal instead of inter-organizational, because it depends on personal relationships with one or more managers. For that reason, longstanding personal relationships strengthen contractual trust in VCG's MSRs.

Competence trust building

Without betraying VCG's contractual trust, the supplier might be unable to comply with promises because of a lack of competence. In that case, the supplier is willing to perform the best he can and indeed does everything in its power to succeed, but still fails. In most cases, however, VCG trusts suppliers to succeed in delivering the goods as required and acting on changes or improvements as promised. This competence trust is considerably present for batch suppliers based on previous quality and delivery performance levels.

JIS suppliers, however, are trusted more because of VCG's closer performance and capabilities monitoring, which renders good performance more transparent. Obviously, this emphasis on JIS performance is aided by JIS suppliers' geographical proximity. As HVA JIS suppliers produce more complex products with more complex manufacturing processes, these suppliers have VCG's highest capability confidence; of course only on the assumption that all processes function well. In addition, VCG's competence trust is strengthened by the fact that JIS suppliers possess several process certifications, such as ISO-TS, which require considerable process standardization and are subject to monitoring

by external auditors. Furthermore, competence trust in some HVA JIS suppliers has benefited from the fact that VCG literally transferred their infrastructure and knowledge, in the form of assembly lines and employees, to the local supplier facility.

Contrary to contractual trust, the object of competence trust is not that clear. On the one hand, VCG seems to value (or doubt) competences of the supplier organization, implying both human capital and assets. On the other hand, VCG confirms that also manager competence influences VCG's competence trust.

Goodwill trust building

Besides contractual and competence trust, VCG and supplier managers strongly emphasize the importance of goodwill trust, or as they describe it: "trust that the supplier openly and honestly communicates problems, even potential ones, concerning quality, logistics, etc". As VCG managers admit to making mistakes themselves, which sometimes also harm suppliers and for which VCG is not liable, VCG feels indebted to suppliers to understand problem occurrence. Yet, in exchange for this understanding, VCG desires open communication about operational snags. Moreover, VCG trusts suppliers to provide that information even before a certain incident actually causes a problem. VCG does not want the supplier to ignore, minimize or conceal potential problems, because the consequences could substantially impact both VCG and other JIS suppliers. Additionally, VCG expects supplier management to take responsibility for mistakes, so that no time is wasted on identifying which party actually caused it. That way, all energy can be devoted to joint problem solving, sometimes even with assistance from other suppliers. Nevertheless, VCG acknowledges that suppliers are tempted to behave opportunistically, because informing the customer that the organization can not fulfil promises is neither pleasant, nor common practice. Moreover, these problems are recorded by VCG's formal controls and reported to VCC, the supplier's mother company and sometimes to the STVC.

However, VCG places considerable goodwill trust on supplier managers, which are again the prime object of this trust. VCG continuously shares and actively promotes its norms and values (quality, safety, environmental awareness, openness, fairness, empowerment and collaboration) during supplier interaction. Consequently, JIS suppliers are trusted to know that VCG values honest communication more than opportunistic ignorance, even when the problem is only potential with low occurrence chances. That way, operational problems do not necessarily deteriorate, but build goodwill trust when the supplier communicates openly. As performance risk is highest for HVA JIS suppliers, these

suppliers are characterized by many problem solving opportunities for this goodwill trust building. Furthermore, the more frequent interaction with HVA JIS suppliers builds an inter-organizational bond of friendship between VCG and HVA JIS supplier managers. Most relationships with these managers also appear to be longer, because some of them already worked in other functions at the same or other suppliers, or even at VCG. In that respect, we note that longstanding personal relations of ten to fifteen years are not exceptional and further increase goodwill trust. As personal relations with batch suppliers are limited because of less interaction, their goodwill trust is much lower. Nevertheless, VCG clearly indicates that they do trust this supplier type to share severe problems that (potentially) affect VCG production.

Generic trust building via the supplier team

Besides strengthening mechanisms for one specific type of trust between VCG and one specific supplier, our case study reveals a mechanism that specifically aims at building trust, namely the STVC. On both the overall STVC and the workgroup level, socializing (or networking) is put forward as an extremely important goal. For that purpose, every meeting starts with a joint lunch and ends with a joint drink, during which everybody can get to know each other personally and professionally. Yet, the actual goal of this socializing aspect is the creation of a strong bond with high trust. VCG and supplier managers confirm that by socializing the level of mutual trust has increased, so that in case of failure, parties quickly and openly work on a solution by helping each other, instead of placing blame and negotiating penalties to cover production losses.

Furthermore, the STVC forms a joint relationship board, i.e. a structured forum of close interaction between participants, in which mutual interests are established, problems are solved jointly and decisions are made together. Indeed, all STVC members, including VCG, share one goal, namely building as many cars of the order book as possible, on time, with good quality and at the lowest possible cost. VCG continuously promotes this common goal and the norms and values driving the goal in order to convince all JIS suppliers that their contribution to the goal is crucial. The multi-directional communication during STVC meetings contributes to establishing this awareness. Next, the STVC aims at installing joint problem solving with all parties, assisting each other in minimizing operational snags. Also this approach, which requires information sharing of problems, further builds trust based on difficulties that are first shared and then successfully solved. Finally, the STVC workgroup participants jointly work on projects, aiming at problem

avoidance, lower operating costs and higher performance. Based on workgroup meetings, several implementation decisions are made jointly. During these workgroup sessions, VCG and supplier experts share proprietary knowledge, so that all suppliers can be developed. The fact that meeting locations are rotated across all suppliers signals this development goal. In case a workgroup deems appropriate, an outside expert is invited for training.

Concerning the difference between suppliers, it is clear that VCG's trust in batch suppliers can only be built by limited dyadic interaction, because batch suppliers do not participate in STVC meetings. HVA JIS suppliers more frequently attend STVC and STVC workgroup meetings and contribute considerably more than LVA JIS suppliers. VCG managers even confirm that a discussion is going on whether to either always invite all JIS managers or limit participation to those suppliers contributing most and benefiting most from participating. Obviously, this discussion confirms that HVA JIS suppliers not only possess more competencies to share, but also benefit more from workgroup projects, which most adequately builds trust.

Social pressure

Our data show that every supplier is aware of the common inter-organizational goal and is familiar with VCG's norms and values, like openness, fairness, empowerment and collaboration. As a result, VCG and suppliers feel related, like in a team or a clan. Consequently, every supplier faces negative consequences in case of an operational snag, to which he acts opportunistically. Although VCG continues stressing mutual cooperation in both parties' interest, the interacting supplier manager(s) is (are) faced with negative personal feelings, because VCG personally confronts him (them) with mistakes that harm the common goal and do not comply with the norms and values. This social pressure is exercised most on HVA JIS suppliers, as those suppliers are subject to daily operational snags requiring problem solving. LVA JIS suppliers receive less social pressure, while batch suppliers only seldom require VCG interaction for problem solving.

In addition to this bi-directional social pressure, the STVC strengthens VCG's social pressure by bringing all separate MSRs together into one big supplier clan. Clearly, the STVC's main goal is not controlling VCG suppliers. In fact, the STVC is run by suppliers to the benefit of all suppliers and VCG, with maximum support of VCG. Yet, the STVC contributes to social pressure by the fact that important mistakes, depending on the type, are reported on the STVC quality, logistics or IT workgroup meetings, and the most

severe ones even at STVC plant manager meetings. Again, the idea is neither to punish the supplier by providing all details to other suppliers, of which some are competitors, nor to blame some supplier department or supplier manager. The first goal of this collective problem sharing, sometimes even by means of clear pictures, is to learn from mistakes, identify areas of potential amelioration for which workgroup projects could be set up and further stress VCG's open communication. Second, the joint problem sharing builds trust, not only between VCG and the supplier that caused the problem, but between all suppliers, as discussed in the previous paragraph. Last but not least, managers noted that when a supplier snag is reported to all suppliers present at the STVC meeting, the responsible supplier faces negative response of both VCG and all other suppliers. Indeed, because operational snags harm both VCG's and JIS suppliers' production, every supplier needs to give account not only to VCG, but also to all other JIS suppliers. Hence, reporting supplier failures at the STVC offers VCG two means of increasing social control. First, VCG is able to formally structure its bi-directional social pressure. Second, the presence of other JIS suppliers signals the accountability towards all JIS suppliers and augments negative guild feelings in case of supplier failure.[17]

In other words, the STVC creates a clan, in which VCG and JIS suppliers not only look *after* each other, in terms of helping and trying to improve each other, but also look *at* each other, in terms of signalling that the clan does not tolerate mistakes potentially harming the clan without proper action. To that end, social sanctions will be applied by all clan members on defaulting suppliers. We argue that this type of control by the STVC is *social* control in its essence and serves a very important role in VCG's MCS of MSRs. Yet, this importance differs depending on the type of supplier considered. As batch suppliers are no member of the STVC, these suppliers are only subject to dyadic social pressure.

[17] A good example of social pressure relates to the monitoring and back-up procedure test of EDI communication, set up by the IT workgroup. First, VCG's IT department drew up an audit questionnaire, which some suppliers did not fill in. Yet, when the following workgroup meeting clearly stated which suppliers filled in the audit form, all non-respondent supplier managers immediately apologised and asked to provide the questionnaire once again. Clearly, no supplier manager likes to be confronted with his name tied to non-compliance, especially not in front of several people involved. The next step in the IT workgroup project involved testing the EDI monitoring and back-up procedure. To heighten the level of supplier priority giving to the test, the IT workgroup dropped anonymity in the report system during meetings. Again, supplier managers responded positively to the social pressure, following from their name being linked to a performance score, which was visible to all other workgroup participants.

Furthermore, HVA JIS supply is more complex, so that the potential negative impact on VCG and other suppliers is larger than the one of LVA JIS supply. Additionally, HVA JIS suppliers tend to attend STVC and STVC workgroup meetings more frequently, which further increases the opportunity of managers to be confronted with mistakes.

Exemplary interview quotes relating to VCG's informal management controls can be found in table 1.4.

Theoretical variables	**Interview Quotes (Source)**
Trust building	
Specific trust Building	
Contractual trust Building	I want the plant manager to call for help and to simply tell me if he can not promise something. I do not want promises, which can not be kept, because Volvo can not do anything with those promises. Volvo prefers the supplier to openly and honestly inform Volvo that they experience a problem, which they can not solve for the time being. […] Promising that it [the problem] is solved tomorrow and not keeping that promise, is something a supplier can not do often. That can happen once and then I point out that it does not work that way. The second time, that leads to relational problems. I prefer the supplier to say: "I can not do it". (VCG)
	For me, trust means "a word is a word". For me, little has to be put on paper. When somebody promises me something or I promise something to somebody, I assume that it happens. […] With Volvo, that works perfectly. Relations are built up and that is not possible with everybody. When someone new starts at Volvo, that person does not have that bond with the suppliers. That has to be built up with people. (batch supplier)
Competence trust Building	I want to send out trust to Volvo that we deal with the problems and solve them in reasonably short term. [...] Trust needs time to be built up anyhow. One does not have trust immediately. Besides, trust is not built by what you say, but by what you do. The results have to be there. (HVA JIS supplier)
	The personal relationships with Volvo are rather good, because our plant is located very near by Volvo and lots of our co-workers came from Volvo. […] I believe that [the relationship] works pretty well with all suppliers, although it might work slightly better with our co-workers, because they are all ex Volvo people. (HVA JIS supplier)
Goodwill trust Building	I admit that I do not call Volvo and admit to having a problem for every hick-up in our [HVA JIS] process, because then I can call them every day. Every day, there are problems in a company. The trust has to be there that, when the problem is serious and we see "now, it will go wrong", we provide the right information on time, so before the process actually goes wrong. (HVA JIS supplier)
	Being honest towards each other and not covering up problems works best. […] By working in beforehand, certain things can be taken into consideration. This approach is constantly promoted by Volvo and me. […] That honesty towards each other is a consequence of respect for each other. That respect has to be earned and can not be claimed; not even by the customer. Respect is mutual trust that rises from many years of cooperation, experience with open and less open managers and talking about one thing and another. (VCG)
	Trust is built across time by good cooperation and not dropping each other, both externally and internally, in case of problems. Then, one must always be open and honest. In case of problems, it depends on how you deal with those problems whether trust gets damaged or strengthened. (LVA JIS supplier)

Generic trust building via STVC	
Global STVC / STVC workgroup Attendance	Socializing is a very important aspect of the STVC meetings. Because of that, every meeting starts with a joint lunch, to have loose chats about every possible subject. […] The most important reason to work on socializing is that suppliers need a strong bond and lots of trust towards each other. That is necessary in a JIS environment, because if one supplier stops, for example because of a stock out or machine breakage, not only that supplier suffers, but also Volvo and the other JIS suppliers. When the entire settlement of that issue has to be done via the management, parties will kill each other. The whole reasoning of "There was a stoppage of that long, for which that supplier is to blame, so he has to pay that high of a penalty" only leads to bigger problems. […] Socializing is important in creating trust that works across company boundaries. That way, one can cooperate with a neighbour in case of problems. On the other hand, the STVC also provides the opportunity to talk with people and exchange ideas, before a problem arises. (HVA JIS supplier)
	I promote the STVC with an open communication, where suppliers sit together as a team and try to help each other. (VCG)
	Volvo is the binding agent of the suppliers, because all suppliers have one common goal, which is supplying Volvo. (HVA JIS supplier)
	The attendance rate is an indication of who attaches most importance to participating in the STVC. The time a manager makes for the meeting is an indication of the importance he attaches to the meeting, because time is something neither one of us has. (HVA JIS supplier)
STVC workgroup Contribution	Concerning the contribution relating to logistics and quality, the bigger [HVA JIS] suppliers offer a larger contribution to the STVC and the work groups. […] Based on the situational circumstances, there is more or less input and contribution to the STVC meetings. Some suppliers even do not participate at all. (LVA JIS supplier)
Social pressure	
Supplier interaction for problem solving	I am proponent of the approach in which we work with the customer on a problem till 8pm, then have dinner and a drink together, sometimes till the early hours, and continue cooperation the next morning. That cooperation leads to a team spirit, in light of which the customer does not tell the supplier that he produces and therefore has to solve the problem, and the supplier does not tell the customer that he developed problems and therefore is responsible for dealing with them. On the contrary, the question is how both parties can solve the problem jointly. (HVA JIS supplier)
Global STVC / STVC workgroup Attendance	Moreover, there is the STVC, which exercises social control on the suppliers. That is, in the STVC the performance of every supplier is shown. And nobody likes to be offended as worst performer. That stimulates and motivates even more. Although the suppliers obviously differ and therefore can not be compared just like that, the worst performer gets seriously offended, especially when he stops Volvo and that way also the other [JIS] suppliers. At that moment, there are nineteen people across the table saying: "What the hell is wrong with that supplier?", because they get in as much trouble as Volvo. (HVA JIS supplier)
	Concerning IT, we have experienced intense moments, in which an IT problem at a supplier stopped Volvo and the JIS suppliers, including us [HVA JIS supplier]. Through the STVC, which serves common interests, that supplier was asked to let his systems be checked. (HVA JIS supplier)

Table 1.4: Exemplary interview quotes concerning VCG's informal management controls

5. Discussion

The previous analysis confirms the contingency framework's explicative power for VCG's MSRs. Based on the distinction between batch, LVA JIS and HVA JIS suppliers, signalling the situational differences between VCG suppliers, we were able to identify substantial differences in the MCS. These corresponding differences clearly visualize the associations in the framework. Because HVA JIS suppliers are characterized by high performance and relational risk, this supplier type is subject to high outcome and behaviour control. Compared to batch suppliers, this supplier group's outcome is monitored more frequently, responded to more quickly and penalised less stringently. In addition, these suppliers' behaviour is governed by means of an extensive syllabus and weekly company visits. Furthermore, all levels of trust building are highest for HVA JIS suppliers. Finally, the STVC creates generic trust building and social pressure possibilities, which are largest for HVA JIS suppliers. That way, the high levels of risk for this supplier type are governed by the highest levels of both formal and informal control techniques. LVA JIS suppliers are found to be positioned between batch and HVA JIS suppliers on all control systems, which reflects the association of medium governance with medium levels of risk.[18]

Thus, despite having studied MSRs with good operational performance and considerable levels of formal control, we still find high levels of informal control. Apparently, the risk of the more formal MSR, is too high to be governed by primarily formal controls. VCG considerably stimulates trust building and cooperation, because the (potential) costs of unilaterally imposing demands with little trust are considered much higher. In other words, the combined MCS of VCG with substantial levels of both formal and informal control is argued to be designed specifically to improve performance. This does not mean, however, that operational snags do not occur. On the contrary, those problems are daily business, especially in case of HVA JIS suppliers. Yet, VCG believes

[18] Nevertheless, we acknowledge that small differences remain within each supplier group. These differences might be captured by a continuum interpretation from low to high contingency level, low to high risk and therefore low to high management control structures. By positioning the types of MSRs on these continuums, it becomes clear that a relatively low/high position on the contingency variable continuum corresponds to a relatively low/high position on the MCS continuum. Such continuum interpretation is comparable to recent case based management control findings (e.g. Kamminga & van der Meer-Kooistra, 2007; Sartorius & Kirsten, 2005; van Veen-Dirks; 2006).

that dealing with those snags would be more complicated if the OEM would not follow up on suppliers by means of a combined MCS in a cooperative environment.

Consequently, our case findings contradict that MSRs would be governed by little informal control mechanisms (Das & Teng, 2001; Bijlsma-Frankema & Costa, 2005). Moreover, our case strengthens the external validity of case findings on less formal IORs. Indeed, also studies on R&D collaboration (Cooper & Slagmulder, 2004), strategic alliances (Dekker, 2004) and joint ventures (Kamminga & van der Meer-Kooistra, 2007) indicate the importance of informal control usage in inter-organizational MCSs. Furthermore, these studies show considerable evidence of MCS's contingency dependence. In essence, the same two inferences can be made for the MCSs of service outsourcing relations (Langfield-Smith & Smith, 2003; Nicholson et al., 2006; van der Meer-Kooistra & Vosselman, 2000). So, despite theoretical framework differences, our result of a combined MCS that is contingent on situational characteristics corresponds to previous case findings. Even more formal MSRs are governed by a considerable amount of informal control.

In that respect, the most striking finding of this study is certainly the existence and the role of VCG's supplier team in controlling MSRs. In particular, the STVC functions as a clan, which not only structures, and that way strengthens, VCG trust building and social pressure techniques, but also extends this control towards all JIS suppliers. That way, management control on dyadic JIS supplier relations is strengthened by the clan of all JIS suppliers. Yet, this control only follows from the STVC's first goal, which is stimulating and facilitating collaboration among all participants, in order to continuously improve manufacturing processes (i.e. kaizen costing). In that respect, the STVC cooperation is comparable to inter-organizational teams working together on designing new or improved products during the R&D phase of the supply chain, often by means of target costing, which aims at cost reduction through collaboration (Cooper & Slagmulder, 2004). To transpose this collaborative behaviour between mother companies during R&D to facilities during manufacturing, VCG set up the STVC with JIS supplier facilities. In essence, this supplier team structures the unstructured interaction. Compared to formal information exchange, like electronic EDI messages and formal supplier follow-up, informal information sharing largely depends on the personal relationship and willingness of interacting managers. By means of the STVC, this bi-directional social interaction becomes structured and at the same time multi-directional due to frequent participation of many JIS suppliers. In addition, the STVC offers the possibility to substantially increase informal

control on dyadic MSRs. First, the STVC magnifies bi-directional trust between manufacturer and supplier and multidirectional trust among all suppliers. In fact, our study reveals that the forum is a textbook case of building trust by means of several techniques, including networking, frequent information and knowledge sharing, joint decision making and joint problem solving. Second, the STVC clan strengthens VCG's social pressure on suppliers, as supplier errors are discussed during STVC (workgroup) meetings. Obviously, the presence of all suppliers involved increases potential negative feelings with respect to operational snags. So via the STVC, VCG succeeds in structuring unstructured social *interaction*, and by doing so, transforming it into social *control*.

Nevertheless, it must be emphasized that the social control technique of the STVC would not work without the willingness of all suppliers to open up their facilities during supplier visits and share both technical and managerial knowledge. Hence, the information exchange exceeds mere cost information, as discussed in studies of open-book accounting during commercial negotiations (Seal et al., 1999) and R&D (Kajüter & Kulmala, 2005), to include all kinds of information concerning manufacturing and delivery processes, as exemplified by the case study of Mouritsen, Hansen & Hansen (2001).[19] Furthermore, STVC interaction offers participants the opportunity to get to know each other personally regarding family situation and/or personal interests. In a setting in which cooperation based on mutual trust[20] is considered crucial and built through personal interaction, this last form of information exchange is indispensable to jointly operate in JIS and already avoided

[19] One important remark concerning the STVC is the fact that trust building and collaboration among VCG suppliers is not as evident as between VCG and particular suppliers, because some supplier facilities are *competitors* on mother company level. For example, VCG has different suppliers for car seats and cabling. Yet, the cabling supplier delivers car seats to other OEMs and could definitely supply car seats to VCG as well. This situation negatively impacts facility managers' willingness or permission to open up factories and share proprietary knowledge. Nevertheless, the STVC overcomes this barrier by arguing that although suppliers are competitors in the global market place, their competitiveness only plays during commercial negotiations, which are concluded well before the start of manufacturing. Indeed, during the manufacturing phase, all suppliers serve the same purpose regarding their product, namely supplying the right product, on time, with good quality and at the lowest possible cost. By considering this common goal and allowing suppliers to hold back certain production infrastructure or process knowledge which is patented, the STVC finds most suppliers prepared to *trust and collaborate with competitors*.

[20] Concerning the question whether trust primarily exists between people or organizations (cf Tomkins, 2001), our case data contain considerable evidence of inter-personal trust. This compares to similar evidence of Dekker (2004) and Cooper & Slagmulder (2004).

numerous line stops. So, although the STVC advantages are not always directly measurable in monetary terms, all participating members are convinced that these benefits play an important role in VCG's and JIS suppliers' performance, because better delivery disturbs VCG's manufacturing less.

To end this discussion, we compare VCG's STVC with the approach of Toyota (cf Dyer & Nobeoka, 2000). In order to increase the knowledge base and lower the knowledge sharing cost, Toyota actively shapes a network identity with its suppliers by means of shared values and goals, and mechanisms such as a supplier association and small group learning teams, which resemble VCG's STVC. Nevertheless, we believe VCG considerably differs from Toyota, in particular concerning the degree to which suppliers are compelled to collaborate and adopt the Toyota production system (TPS). Indeed, Toyota admits that if a supplier would be unwilling to open up operations to other firms in the network, the refusal would be a serious breach of faith, jeopardizing future collaboration with the supplier (Dyer & Nobeoka, 2000). Additionally, Toyota appears much more interested in transferring Toyota knowledge to suppliers than learning from suppliers, which results in the obligation for suppliers to work with their systems. Therefore, we argue that Toyota sets up appropriate mechanisms to create a network identity, but with little respect for supplier identity or particular supplier knowledge. VCG, however, considers it essential not to push collaboration, but to strive at unmediated cooperation between JIS suppliers. For example, VCG does not compel supplier participation at STVC meetings, but allows supplier (plant) managers to freely decide on their presence. Additionally, VCG does not demand suppliers to comply with their way of manufacturing, but stimulates them to transfer their expertise to VCG as well. VCG always helps suppliers as partners and by mutual agreement, if necessary on a daily basis. Only when problems keep dragging, VCG uses its commercial power advantage to speed up a solution. By means of the STVC and its collaboration, VCG expresses respect for supplier company culture, supplier responsibilities and supplier expertise, while installing one common clan culture that surpasses company boundaries.

6. Conclusion

This paper contributes to the inter-organizational management control literature by illustrating how manufacturers design the MCS of supplier relations in the manufacturing phase of the supply chain. Although MSRs offer important cost reduction possibilities, which require appropriate management controls (Carr & Ng, 1995; Cooper & Slagmulder,

1999), these control techniques lack sufficient academic knowledge (Cooper & Slagmulder, 2004; Langfield-Smith & Smith, 2003; Scannell et al., 2000). Therefore, we investigate supplier MCS design in one of the most competitive manufacturing industries in the world, namely automotive. Especially this industry is considered to be trend-setting in the search for continuous improvement, which is exemplified by the rise of lean manufacturing and lean supply (cf Womack et al., 1990) and kaizen costing (e.g. Carr & Ng, 1995).

Research on procurement and R&D found that other types of IORs, like R&D collaboration (Cooper & Slagmulder, 2004), strategic alliances (Dekker, 2004) and joint ventures (Kamminga & van der Meer-Kooistra, 2007) are governed by a combination of formal and informal control. Based on these findings' external validity, MSRs could be expected to be governed by a combination of formal and informal control as well. However, as MSRs are more formal than those IORs, MSRs could be expected to be governed by primarily formal controls with little informal controls (Das & Teng, 2001; Bijlsma-Frankema & Costa, 2005). Hence, the literature offers different MCS designs for MSRs, either a combined MCS or one consisting of primarily formal controls, which motivates studying the MCS design of MSRs and the importance of informal controls in that design. Since automotive practice shows evidence of high and low levels of informal control as well, our first contribution is answering how the MCS of automotive MSRs is designed. Yet, besides illustrating that MCS design, this paper also contributes to explaining the MCS design, because evidence on contingency theory's explicative power in MSRs is rather limited (Cooper & Slagmulder, 2004; Langfield-Smith & Smith, 2003; van der Meer-Kooistra & Vosselman, 2006). To that end, we propose a refined theoretical contingency framework based on recent inter-organizational management control theory, but specifically adapted for the manufacturing phase.

In order to illustrate the validity of this framework in practice, we performed an in-depth case study of the supplier MCS of Volvo Cars Gent. Our semi-structured interviews and archival data contain substantial evidence of the proposed associations and indicate that informal controls are very important in manufacturing. The identification of three supplier types, namely batch, LVA JIS and HVA JIS suppliers, characterized by different levels of antecedents and risks, visualizes the association with the management controls tuned to govern the risks. For example, as HVA JIS suppliers score relatively high on all contingencies and subsequently on both performance and relational risk, VCG designed the MCS accordingly, with high levels of outcome and behaviour controls. Yet, besides these

formal controls, VCG pays considerable attention to informal control, more specifically to different kinds of trust building techniques and social pressure. In that respect, the most striking finding of this paper is the existence and the role of VCG's structured supplier team in controlling MSRs. In fact, the STVC functions as a clan, which not only structures, and that way strengthens, VCG's trust building and social pressure, but also extends this control towards all JIS suppliers. That way, management control on dyadic JIS supplier relations is strengthened by the clan of all JIS suppliers. This combined MCS is designed specifically to improve performance, which corresponds to earlier inter-organizational management control research (e.g. Anderson & Dekker, 2005). As our theoretical model drew on findings from other less formal IORs, our case not only offers more evidence of those findings' external validity, but also confirms that MSRs are governed depending on situational characteristics. By studying an under-explored part of the supply chain, for which the inter-organizational management control literature proposes different supplier MCS designs, this paper contributes to this increasingly growing literature by reducing a perceived gap between literature and management practice, as called for by Nixon & Burns (2005).

Naturally, our findings have some important implications. The case findings support the importance of a combined MCS, suited for the contingencies of the MSR under investigation, which corresponds to recent studies emphasizing the *extended* make-or-buy decision (Cooper & Slagmulder, 2004; Gietzmann, 1996; van der Meer-Kooistra & Vosselman, 2000).[21] Although supplier relations, especially in automotive, seem to become more demanding once the manufacturing supply chain phase starts, VCG clearly holds on to cooperative interaction, comparable to the procurement and R&D phase. Instead of lowering collaboration and informal controls in favour of a more demanding approach with more formal controls, VCG balances formal and informal controls and highly values the role of trust building and social pressure. The central role of the STVC strengthens this finding. Consequently, managers should be aware of the benefits of well designed MCSs in MSRs, especially in a very competitive business environment like automotive.

[21] The *extended* make-or-buy decision not only deals with the decision to make or buy, but also with partner choice and MCS design. Our findings indicate that VCG actively considers this *extension* by designing its MCS to support specific MSRs.

Nevertheless, these implications are hampered by an important limitation due to the case research. By only looking at one specific industry and exclusively studying one type of IORs of one automotive OEM, we aimed at maximizing comparison opportunities and minimizing extraneous variation within the case. Yet at the same time, we limited generalizability outside this context. For example, it remains unclear to what extent VCG's company culture determines the use of informal controls compared to other (automotive) organizations. Similarly, the impact of prior supply chain phases and mother company influences on VCG's MSRs remain unaddressed. However, these limitations offer a first avenue for further research. To investigate the external validity of our findings, research could be done on other MSRs, both in automotive and in other industries, like consumer electronics. Especially the occurrence and usage of STVC-like fora in MSRs are worth further investigation, because they seem to offer considerable benefits. To that end, other case studies or a comprehensive survey could be set up.

A second research direction follows from the assumption in our theoretical sampling that VCG's MCS benefits performance. Although this presupposition was confirmed by interviewees, we never really investigated it. Hence, a follow-up study could investigate to what extent the contingency fit between antecedents and management controls, as proposed by the framework, contributes to operational performance (Kamminga & van der Meer-Kooistra, 2007; van Veen-Dirks, 2006). In other words, what would be the negative consequence of a contingency misfit?[22] Yet, in order to effectively study this research question, a longitudinal research design is needed, preferably of changing supplier relations.

Appendix: Interview protocol (main questions + exemplary probes for detail)

Q1. Could you sketch the outsourcing relation between the supplier and VCG?

- When did the relationship start and why did VCG outsource the manufacturing of this product?
- What are the characteristics of the product and its production process?
- What is your function in the company and your role in the VCG-supplier relation?

[22] Since that kind of MCS misfit over time would result in escalating control problems, damaging the MSR performance (Dekker, 2004), such misfitted MCSs would be changed towards a more suitable design (van Veen-Dirks, 2006). So, assuming that MCS dynamics are equilibrating and return to a stable situation after being disturbed (van Veen-Dirks, 2006), the appropriate research question is to what extent a *temporary* contingency misfit *temporarily* negatively influences operational performance.

- With which departments of the supplier/VCG do you most frequently interact?

Q2. How does VCG control the relationship with the supplier?

- Which KPIs for quality, logistics, etc. are set up? Which of them are the most important? How frequently are they followed up on? Are there KPI targets? How does VCG penalize the supplier in case of operational problems or performance below target? Are those penalties negotiable?
- Which procedures, rules, regulations, etc. does VCG put in place to monitor and control supplier behaviour? How frequently is behaviour followed up on? Does VCG visit the supplier?
- Are there other control mechanisms present in the VCG-supplier relation?
- Are there, in that respect, differences with other suppliers?

Q3. How does cooperation between the supplier and VCG work out?

- Is there a difference between cooperation in case of difficulties and cooperation as part of continuous improvement?
- To what extent is information shared in the VCG-supplier relation? Does information sharing occur via personal interaction and/or via the supplier team?

Q4. What is the goal of the supplier team and what are its benefits, if any?

- How big is the supplier's contribution to the supplier team and how big are the benefits from the supplier team for the supplier?
- Are there, in that respect, differences with other JIS suppliers?

Q5. What does trust mean for you (in an inter-organizational context)?

- How would you evaluate that trust in the VCG-supplier relation?
- Is trust important?
- How is trust built?

Q6. Could I look into some relevant documents (e.g. reports, meeting minutes, PP-presentations, contracts, etc.)?

Manuscript 2

The impact of inter-organizational management control systems on performance:
A longitudinal case study of a supplier relation in automotive

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.

1. 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).[23]

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.

[23] 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 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.

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. 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.

2. 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).[24] 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)[25]. Undoubtedly, this third association, stipulating that a MCS fitted on situational

[24] 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).

[25] 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

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.[26]

In the inter-organizational management control literature, only Ittner et al. (1999) and Anderson & Dekker (2005) quantitatively study the third contingency theory element.[27] 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

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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).

[26] 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).

[27] 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.

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).

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.

3. 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.

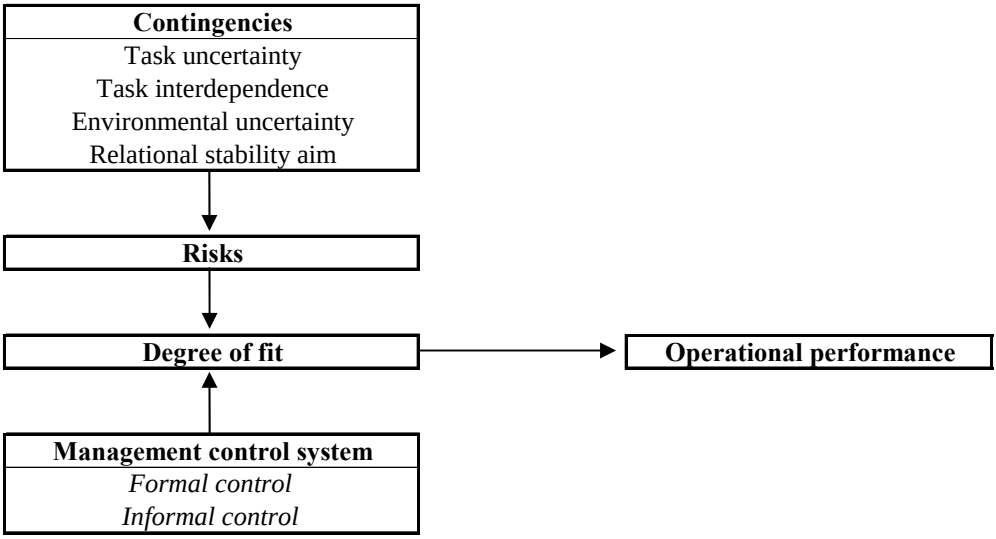

Figure 2.1: Theoretical contingency framework for MCS design and the impact on operational performance of MSRs

The constructs on the left hand side visualize the associations between contingency variables influencing risks and management control techniques governing these risks.[28] 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

[28] 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.

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 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.[29] 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

[29] 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).

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 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)[30]. 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

[30] 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.

fitting the changed contingencies and risks and therefore contributing to performance.

4. Research methodology

4.1. 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 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.

4.2. 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.[31] This high value-added just-in-sequence[32] 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.

4.3. 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. 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.

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[31] 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.

[32] 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.

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

Table 2.1: Interview data summary

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.

4.4. 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.

5. 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)[33], 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.

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.

[33] 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.

> *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[34], 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)*

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*

[34] 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.

> *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[35] 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.[36] (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

[35] 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.

[36] 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.

weekend, to build up safety stock after problems during the 24 hour system work week. Furthermore, VCG 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[37] 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*

[37] 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.

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)

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[38] in November 2004. As SAG had already failed to renew other quality certificates[39] 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)*

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.

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[38] 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.

[39] 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.

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.

6. Discussion

6.1. 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.

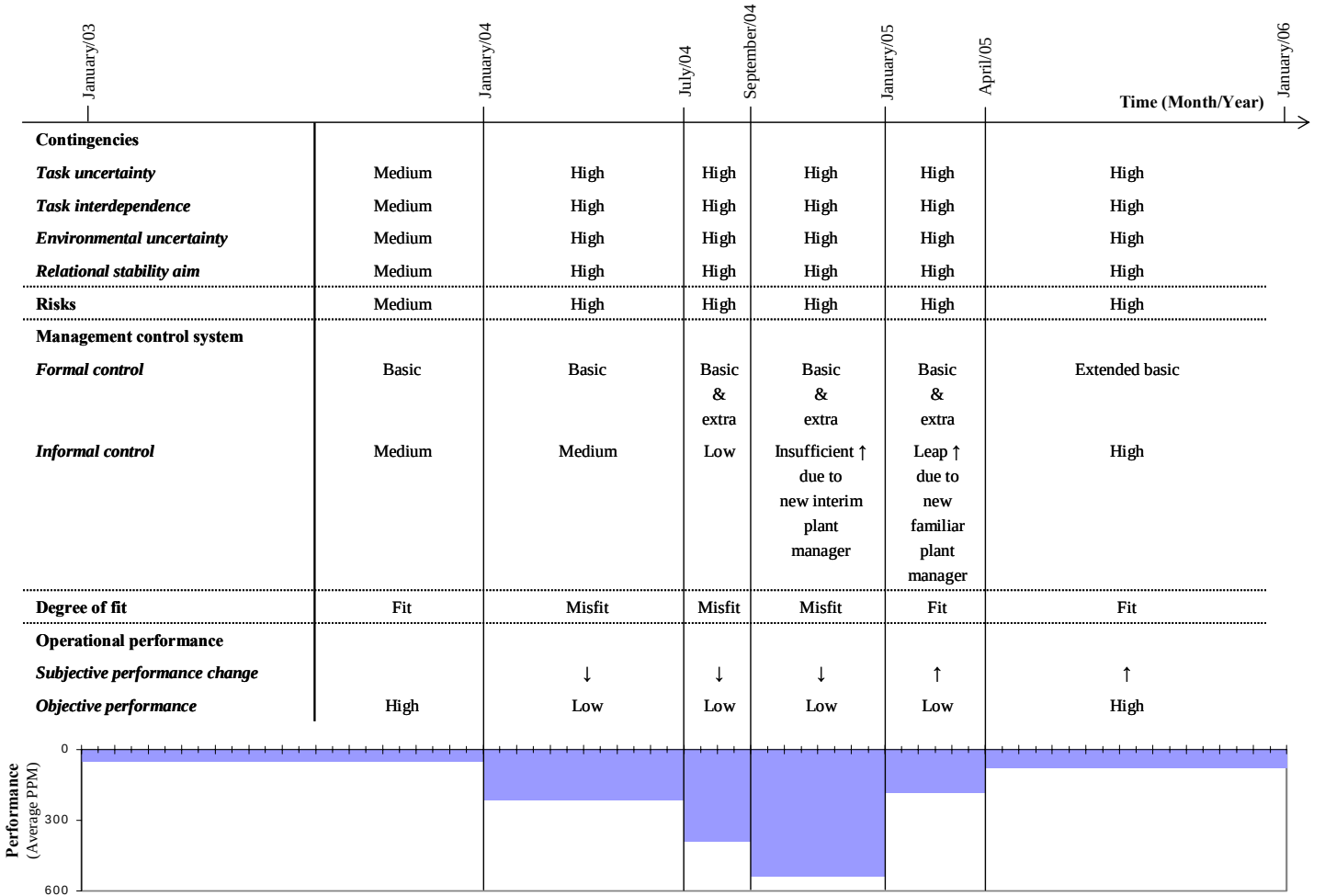

Figure 2.2: VCG-SAG MCS fit and operational performance over time

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[40] 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.

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

[40] 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.

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.

6.2. 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.[41]

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

[41] 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.

problem causes and showed little involvement. 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.

6.3. 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).

7. 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.

Manuscript 3

The impact of cultural resemblance on management control of supplier relations:
Longitudinal evidence in the automotive industry

Abstract

This study explores the impact of cultural resemblance on the management control system (MCS) of supplier relationships. Although MCSs are contingent on situational characteristics and this contingency fit is associated with good performance, it remains unclear whether cultural resemblance between manufacturer and supplier contributes to the speed of MCS change, so that temporary misfits due to changing circumstances are less likely to occur. To illustrate this effect of cultural resemblance on MCS dynamics, we perform a twofold longitudinal case study of similar automotive manufacturer-supplier relationships that differ with respect to cultural resemblance. Findings show that in case of high cultural resemblance, the speed of increasing the level of management control is higher. That way, upcoming contingency changes are appropriately anticipated by an increase in the level of management control, already before contingencies actually change. Consequently, a MCS misfit and potential decreasing operational performance are avoided. Oppositely, in case of low cultural resemblance, adjusting the MCS to changing circumstances requires more time. This leads to a temporal MCS misfit that contributes to escalating operational difficulties, until the MCS is changed. Furthermore, the case data show three mechanisms by which cultural resemblance enhances management control according to earlier findings in the literature: increased communication on the initiative of the supplier, proper information exchange and trust enhancing signals. Finally, our findings show that the manufacturer influences supplier decision making to install a manager of the manufacturer's choice and that way influences the supplier's culture.

1. Introduction

This study explores the impact of cultural resemblance on the management control of supplier relationships. Management control systems (MCSs) are contingent on situational characteristics and this MCS fit is associated with good performance (Donaldson, 2001). Consequently, it is worthwhile to investigate variables that influence the speed of MCS change, so that temporary misfits due to changing circumstances are less likely to occur (Kamminga & van der Meer-Kooistra, 2007; van Veen-Dirks, 2006). Since the buying firm's MCS is the material artefact of its underlying organizational culture (Rousseau, 1990), organizational culture might be such a variable (Harrison & McKinnon, 1999). Yet, despite calls for further research on the role of this variable in MCS design, studies on organizational culture, especially in inter-organizational relationships (IORs), are scarce (Chenhall, 2003; Scheytt & Soin, 2006; van der Meer-Kooistra & Vosselman, 2000). This paper aims to fill that research gap. In particular, we focus on the degree to which a supplier's culture resembles the buyer's culture. In strategic alliances, cultural differences between interacting parties may negatively influence performance (Dekker, 2004; Ireland, 2002; Kale et al., 2000). Yet, whether this influence is associated with an impact on MCS dynamics remains unaddressed. Therefore, the aim of this paper is to illustrate whether the degree of cultural resemblance between buyer and supplier affects the MCS fit in times of changing contingencies.

To that end, we propose a theoretical contingency framework, set up from the position of the buyer. First, this framework visualizes the associations between contingency variables influencing risks, and management control techniques governing these risks (Das & Teng, 2001; Dekker, 2004). Second, the framework includes the dynamic association between a contingency fitted MCS and operational performance (Donaldson, 2001). More specifically, we propose 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. Third, the framework represents the impact of supplier cultural resemblance on the MCS. Provided that we take on the position of the buyer, this variable is defined as the degree to which a supplier culture is hierarchical or developmental and resembles a developmental buyer culture. Whether an organizational culture is hierarchical or developmental depends on the organization's preference for the values control versus flexibility and external focus versus internal focus of the Competing

Values Model (Quinn, 1988; Quinn & Kimberly, 1984; Quinn & Rohrbaugh, 1983). Supported by this conceptualization of organizational culture, we propose that supplier cultural resemblance is associated with a MCS that changes fast enough to fit changed contingencies and that way contributes to operational performance.

We study this proposition for supplier relations in a less studied phase of the supply chain, namely manufacturing (Cooper & Slagmulder, 2004; Langfield-Smith & Smith, 2003; Scannell, Vickery & Dröge, 2000). As organizational culture is found to affect the management control of outsourced *service* providers (van der Meer-Kooistra & Vosselman, 2000), we propose that this variable also impacts the MCS of suppliers performing outsourced *manufacturing activities*. More specifically, this paper presents a twofold in-depth longitudinal case study of "manufacturer-supplier relationships" (MSRs) between a Volvo Cars facility (VCG) and two of its high value-added just-in-sequence module suppliers, that are similar except for the degree of cultural resemblance to VCG. Case research is strong in illustrating the impact of MCS fit on performance, because it allows studying an extensive MCS of individual supplier controls (Ittner et al., 1999; Dekker, 2004). As culture needs to be observed more than measured (Schein, 1996), a case study makes it possible to move beyond static quantitative cross-sectional studies and explore the dynamics of MCSs and organizational culture in all its richness (Baskerville, 2003; Harrison & McKinnon, 1999; Henri, 2006). 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). Finally, the automotive industry suits our 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 et al., 2000).

The case findings confirm our theoretical proposition by illustrating the impact of resembling organizational cultures on the timing of MCS changes and hence the fit-performance association. In case the supplier's culture resembles VCG's culture, upcoming contingency changes are appropriately anticipated by increased management control, before the contingencies actually change. Consequently, a MCS misfit and potential decreasing operational performance are avoided. Oppositely, if the supplier's culture differs from VCG's culture, adjusting the MCS to changing circumstances requires more time. This

leads to a temporal MCS misfit that contributes to escalating operational difficulties, until the MCS is changed. Furthermore, the case data show three mechanisms by which cultural resemblance enhances management control according to earlier findings in the literature: increased communication on the initiative of the supplier, proper information exchange and trust enhancing signals. Finally, one of the MSRs shows a very specific management control technique, namely deliberately influencing supplier decision making to install a manager of VCG's choice and that way influencing the supplier's culture. As these findings benefited from conceptualizing organizational culture via the Competing Values Model, our study demonstrates the usefulness of applying this model for describing organizational culture in qualitative studies (Bhimani, 2003).

The remainder of this paper is organized as follows. In the second part, we provide a thorough literature study to explain and motivate the research question. The third part proposes a theoretical contingency framework, which guides the case analysis. In the fourth part, we briefly discuss the details of the case methodology. The fifth part forms the actual case study and describes how VCG's MCS on two module suppliers evolved during periods of changing contingencies. In the sixth part, we discuss these findings. Finally, we conclude this paper by summarizing the main findings and highlighting some avenues for further research.

2. Literature study

Organizational culture is important to the business community, because it affects all aspects of organizational interaction, intra-organizational as well as inter-organizational (Henri, 2006). On the one hand, enhanced globalization made companies develop multi-national operations in offshore entities with different cultures (Chenhall, 2003). On the other hand, increased global outsourcing made every firm establish relations with suppliers from different countries with different organizational cultures (Harrison & McKinnon, 1999). Consequently, better cultural understanding results in better supply chain performance (Whitfield & Landeros, 2006). Nevertheless, research into organizational culture has been limited, so that this variable is very promising to study (Chenhall, 2003).

Culture is often defined as the shared values, beliefs and assumptions that shape and guide social systems and communication processes (Schein, 1985). Prior research, mainly focusing on the difference between US and Asian cultures, found that differences in these values impact characteristics of MCS design, like the degree of formality in

monitoring and evaluating (e.g. Snodgrass & Grant, 1986; Ueno & Wu, 1993; Vance, McClaine, Boje & Stage, 1992). Like national culture, organizational culture refers to shared values, beliefs and assumptions in organizations that shape and guide human behaviour and its artefacts (Zammuto & Krakower, 1991). These artefacts are all visible structures and procedures that result from a firm's culture, such as the MCS (Rousseau, 1990; Scheytt & Soin, 2006).[42] Consequently, organizational culture influences the design and use of formal (or mechanistic) management controls (Chenhall, 2003). For example, Henri (2006) finds that firms of the flexibility dominant culture type use more performance measures and use these measures to focus organizational attention, support strategic decision-making and legitimate actions to a greater extent than firms of the control dominant culture type. Also informal (or organic) controls are affected by organizational culture, because these controls are grown out of shared values and norms that are shaped by frequent interaction, meetings and management attitude (Merchant, 1998; Ouchi, 1979). For example, trust appears higher in firms of the flexibility dominant culture type than in firms of the control dominant culture type (Ellonen, Blomqvist & Puumalainen, forthcoming).

Given that a manufacturer's MCS on a supplier is affected by the manufacturer's culture, the supplier's culture, in particular the degree of resemblance to the manufacturer's culture, might impact the functioning of the MCS. Indications for this proposition result from prior alliance research. Indeed, studies found that cultural differences make an alliance difficult or impossible to manage (de Rond, 2003; White & Lui, 2005). Conversely, shared values positively influence the level of trust between alliance partners (Gulati, 1995; Luo, 2002). Furthermore, cultural differences between alliance partners may negatively influence performance (Dekker, 2004; Ireland, 2002; Kale et al., 2000). Yet, these results

[42] By defining a company's MCS as an artefact of the organizational culture, we consider culture and control to be different, yet related, constructs. However, some scholars look upon organizational culture differently, namely as part of the MCS. For example, Merchant (1998) speaks of *cultural control* to refer to a specific type of management control, built on the organizational culture and similar to what Burns & Stalker (1961) describe as *organic control*. Nevertheless, the influencing role of organizational culture on management control, as defined in our paper, is widely accepted. Chenhall (2003), for example, defines culture, both national and organizational, as an important contingency variable influencing *both organic and mechanistic controls*, besides inter alia technology and strategy. Also empirical studies like Henri (2006) and Ellonen, Blomqvist & Puumalainen (forthcoming) on the impact of organizational culture on management control, consider these constructs separately.

all relate to organizational culture effects in (strategic) alliances. Hence, the effect of organizational culture on MCS design in other types of IORs, like MSRs, remains unaddressed (Chenhall, 2003; Scheytt & Soin, 2006). Nevertheless, also MSRs require an appropriate MCS design, on which organizational culture has an important effect, which justifies further study (van der Meer-Kooistra & Vosselman, 2000). Furthermore, prior alliance research addressed the effect of cultural differences on MCS design and performance separately. However, MCS design also affects performance, depending on the degree of fit on situational characteristics (Donaldson, 2001).

More specifically, contingency theory proposes that a fit of the MCS design and situational contingencies, such as task uncertainty and environmental uncertainty, results in higher operational performance, whereas a misfit decreases performance (Donaldson, 2001).[43] Although this association forms the underlying assumption of contingency studies on inter-organizational MCSs (Dekker, 2004; Kamminga & van der Meer-Kooistra, 2007), empirical evidence on the validity of this assumption is limited. Furthermore, there is little research on variables that influence the speed of MCS change, so that temporary misfits due to changing circumstances are less likely to occur (van Veen-Dirks, 2006). Yet, this research is justified, as a MCS misfit and associated decreasing operational performance might harm any manufacturer, until the misfitted MCS is changed towards a more appropriate design (Dekker, 2004; van Veen-Dirks, 2006). Therefore, any manufacturer is interested in variables contributing to the avoidance of such a performance decrease by preventing a MCS misfit. Organizational culture, in particular the degree of supplier cultural resemblance to the manufacturer's culture, might be such a variable due to its impact on the functioning of the MCS (Harrison & McKinnon, 1999). Hence, further study is required on what role organizational cultural resemblance plays in the MCS fit-

[43] 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 interaction between the MCS and its situational contingencies (Gerdin & Greve, 2004; Luft & Shields, 2003).

performance association (Harrison & McKinnon, 1999; Henri, 2006).

The preferable method for such research is an in-depth qualitative case study, for three reasons. First, the relationship between MCSs and organizational culture can not be depicted as a simple matter of cause and effect (Henri, 2006; Scheytt & Soin, 2006). Second, case research copes with two important concerns on prior accounting studies using Hofstede's (1984) values (Baskerville, 2003; Chenhall, 2003; Harrison & Mckinnon, 1999).[44] On the one hand, Hofstede observes culture from the outside, which challenges mainstream social sciences that try to understand culture by being within. On the other hand, Hofstede's value dimension conceptualization does not allow anchoring of culture in time, so that dynamics remain unexplored. Consequently, more qualitative research is called for that moves beyond static quantitative cross-sectional studies and explores the dynamics of MCSs and organizational culture in all its richness (Baskerville, 2003; Harrison & McKinnon, 1999; Henri, 2006). Third, prior survey research on the inter-organizational MCS fit-performance association was unable to study extensive MCSs with formal and informal control techniques on individual suppliers (Anderson & Dekker, 2005; Ittner et al., 1999).[45] Consequently, more case research is called for that investigates this association in practice.[46] As we are not aware of any case study that investigates the associations between organizational culture, MCS design and performance in MSRs, our paper answers both research calls by means of an in-depth longitudinal case study of two MSRs.

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[44] Although previous accounting studies used Hofstede values to measure national culture, we argue that the concerns mentioned here are valid for any study on culture, including organizational culture.

[45] Ittner et al. (1999) and Anderson & Dekker (2005) study and find the MCS fit-performance association by means of a survey. Yet, both surveys only investigate a limited set of management control techniques. Ittner et al. (1999) focus on supplier selection and monitoring, the latter being captured by supplier certification and face-to-face contact. Anderson & Dekker (2005) look at formal management control in the form of the supply contract. Moreover, both studies acknowledge the limitation of only reflecting average inter-organizational practices instead of closely examining individual supplier controls.

[46] The only case studies looking into the fit-performance association are van Veen-Dirks (2006) and Heikkilä (2002). Yet, van Veen-Dirks' (2006) study on the alignment between production environment characteristics and MCS design remains within the boundaries of one organization and is based on complementarity theory. Conversely, Heikkilä (2002) does study IORs, but focuses on customer relations; in particular the demand chain structures that fit specific customer situations.

3. Theoretical framework and research proposition

To illustrate the impact of organizational cultural resemblance on MCS dynamics in practice, we propose a theoretical contingency framework for supplier relations in the manufacturing phase of the supply chain, which can be found in figure 3.1.

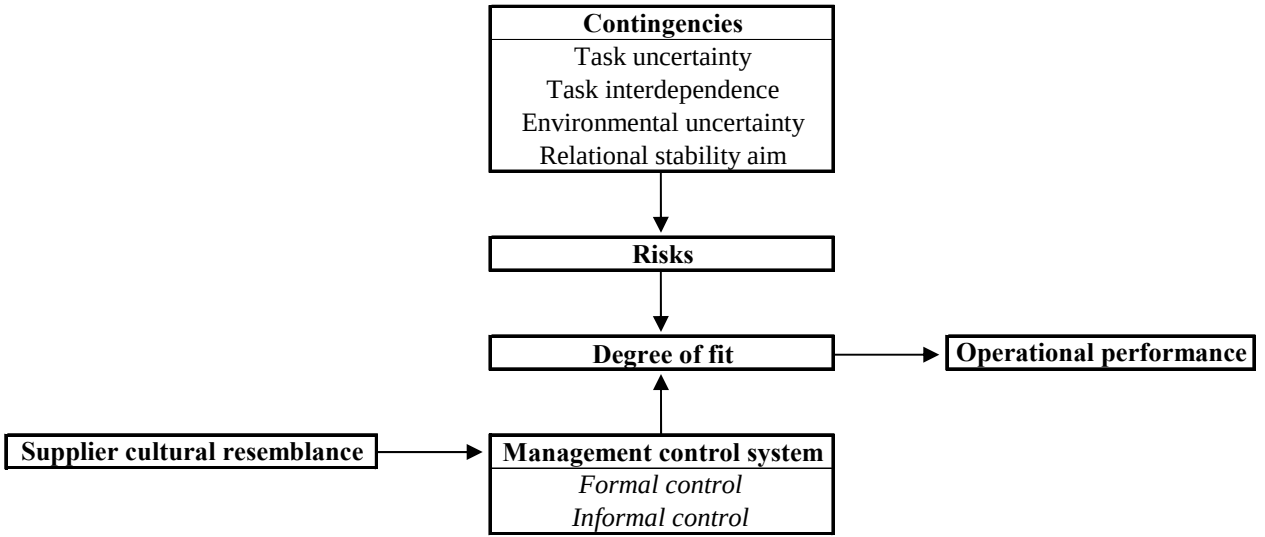

Figure 3.1: Theoretical contingency framework for MCS design of MSRs

On the left hand side of the framework we include supplier cultural resemblance, which represents the degree to which the supplier's culture resembles the manufacturer's culture. Despite our in-depth qualitative case study, our research requires a model of organizational culture to effectively compare two cultures and assess the degree of cultural resemblance. Therefore, we conceptualize organizational culture by means of the Competing Values Model (CVM) (Quinn, 1988; Quinn & Kimberly, 1984; Quinn & Rohrbaugh, 1983), a model suited for representing organizational culture (Howard, 1998) and used in earlier accounting studies of Bhimani (2003), Dunk & Lysons (1997) and Henri (2006). Despite its limited use in management control research, this model is appropriate for organizing and interpreting a wide variety of organizational phenomena, such as values, organizational forms and decision-making effectiveness (Quinn & Kimberly, 1984). Hence, it must be clear that we do not use the CVM to quantitatively measure organizational culture, but to represent organizational culture, while taking into account its richness and dynamics via case research. That way, we follow Bhimani (2003), who first describes a cultural change programme and new process based target costing system qualitatively, i.e. based on interviews and archival data, and later interprets these findings *in terms of* the CVM.

In essence, the CVM assumes that different organizational cultures do not result from different sets of values, but from different emphases on a limited set of values. These values are grouped in two dimensions with two competing values at the poles. These dimensions should not be interpreted as a dichotomous split between the values at the pole, but as a continuum of these values (Henri, 2006). The first dimension consists of *control* versus *flexibility* and represents a firm's preference for control, stability and order versus a preference for flexibility, change and spontaneity. That way, it involves a continuum from mechanistic to organic processes (Quinn, 1988).[47] The second dimension comprises *internal focus* versus *external focus* and represents the continuum of a company's focus on activities occurring within the firm versus outside the firm. An internally-oriented firm

[47] A similar distinction is made with respect to management control (Burns & Stalker, 1961). In particular, "mechanistic controls rely on formal rules, standardized operating procedures and routines", while "organic systems are more flexible, responsive, involve fewer rules and standardized procedures and tend to be richer in data" (Chenhall, 2003, p. 131-132). Hence, the MCS of organizations with a control culture is likely to be characterized by a strong emphasis on mechanistic formal controls, while the MCS of organizations with a flexibility culture is likely to be characterized by a strong emphasis on organic informal controls (Henri, 2006).

expends resources to optimize existing operational equipment and practices. An externally-oriented firm, on the other hand, scans the environment to assess relative strengths and weaknesses vis-à-vis competitors, suppliers and customers, and makes changes to the firm accordingly (McDermott & Stock, 1999). The two dimensions result in four types of organizational culture: hierarchical (control & internal focus), group (flexibility & internal focus), developmental (flexibility & external focus) and rational (control & external focus). As each type is an ideal, a firm has a combination of different cultures, although one type may be dominating the others (Quinn, 1988; Quinn & Kimberly, 1984; Quinn & Rohrbaugh, 1983). Therefore, we refer to the notion of *dominant type* in order to capture the *position* of an organization in the CVM (Henri, 2006). For example, an organizational culture of the hierarchical dominant type most closely resembles the hierarchical ideal type because of a *large* focus on control and internal activities, *and* only a *small* focus on flexibility and external parties. That way, the *dominant type* positioning makes it possible to compare organizational cultures that are qualitatively studied from the inside instead of measured from the outside. A second advantage of the *dominant type* positioning is the possibility to integrate cultural dynamics. As the value dimensions are continuums, a change in culture can be modelled as a change in dimension positions and a shift from one dominant type to another. Yet, as the dominant type terminology would overload our argumentation, it is dropped in the remaining of this paper. Still, all organizational cultures should be interpreted as dominant types.

Despite the clear advantages of qualitative research mentioned previously, this methodology limits a full study of the CVM. More specifically, a twofold supplier relationship study of a single manufacturer confines our investigation to two culture types. The first one is the manufacturer's culture, while the second one is a substantially differing supplier culture, of which the influence can be contrasted to the influence of a resembling supplier culture. As a qualitative study benefits most from cases diverging as much as possible, a comparison between two culture types differing on both value dimensions seems most suited. Consequently, the most appropriate comparisons are hierarchical versus developmental and group versus rational. From these comparisons, the one between hierarchical and developmental culture already demonstrated its ability to shed more light on different perceived success of a new management accounting system in the study of Bhimani (2003). Therefore, we opt for the same two culture types, of which the developmental type is chosen as manufacturer culture. This choice is based on the

expectation that the influence of different degrees of supplier cultural resemblance on a developmental manufacturer's MCS is larger than on a hierarchical manufacturer's MCS. Hence, we define supplier cultural resemblance as the degree to which a supplier culture is hierarchical or developmental and resembles a developmental manufacturer culture.

The constructs in the centre of the framework visualize the associations between contingency variables influencing risks, and management control techniques governing these risks.[48] The degree to which the level of management control fits the level of risks is conceptualized by means of the degree of fit construct. 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 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

[48] 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.

inter-organizational MCSs (e.g. Dekker, 2004). Sako (1992) distinguishes three types of inter-organizational trust building, namely building contractual, competence and goodwill trust.[49] 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 exerted by the manufacturer (Bijlsma-Frankema & Costa, 2005; 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 (Lowe, Deibridge & Oliver, 1997). The arrow to performance depicts the fit-performance association. 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 operational 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 suitable design (van Veen-Dirks, 2006). These dynamics are also captured by the fit-performance arrow and further justify our choice for a longitudinal case study. In essence, we assume that MCSs are equilibrating and return to a stable situation after being disturbed (van Veen-Dirks, 2006)[50]. In contingency

[49] 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).

[50] 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 assumes that also misfits occur for extended periods of time (Luft &

terminology, this change is called “Structural Adaptation to Regain Fit” or “SARFIT” (Donaldson, 2001): 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.

Finally, the arrow from supplier cultural resemblance to MCS represents our research proposition: supplier cultural resemblance is positively associated with the speed at which the MCS changes, so that the MCS keeps (or quickly regains) its fit in case of changing contingencies. Indeed, White & Lui’s (2005) survey on alliances in the construction industry provides significant evidence that cultural differences between partners make the alliance more difficult to manage. In particular, an organization will expend significantly more managerial time and effort on interacting with a partner, which is very different in terms of organizational culture, in order to avoid or mitigate effects of miscommunication and conflict (White & Lui, 2005). Transposing these findings to a MSR setting learns that a difference in cultural resemblance between manufacturer and supplier is associated with a difference in time and effort needed to control the supplier. More specifically, more supplier cultural resemblance increases the speed of extending management control, because the manufacturer can evaluate suppliers with cultural similarities faster (Bierly III & Gallagher, 2007). That way, time is saved, which otherwise would be lost on trying to understand why people act the way they do (Aquilon, 1997). As time has become an important source of competitive advantage in manufacturing industries, a lot of emphasis is put on high awareness of time requirements and rapid decision making (Bierly III & Gallagher, 2007; Heikkilä, 2002; Stalk, 1988). In contingency terminology, this advantage means that when a MCS misfit is changed faster, performance picks up more quickly (Donaldson, 2001).

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.

4. Research methodology

4.1. Case study research

An explanatory case study (Yin, 2003) suits studying our research proposition, as it involves 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 the impact of supplier cultural resemblance on the dynamics of MCS design in MSRs.

Several inter-organizational management control case studies (e.g. Bhimani, 2003; Cooper & Slagmulder, 2004; Dekker, 2004; Kamminga & van der Meer-Kooistra, 2007) demonstrate that MCS design can be adequately investigated by means of case research. Furthermore, organizational cultures, subsequent behaviour of companies and the influence on the functioning of the MCS are very complex. Therefore, an in-depth study is needed to discover how different parties respond to a situational change and whether organizational culture has any effect on that response. Bhimani's (2003) work clearly demonstrates this, as mainly the qualitative evidence provide insight in the actual reasons behind the influence of culture on perceived accounting system success, which was found by means of a survey. This observation not only justifies the choice for a case study, but also forms the reason why more of this research is requested (e.g. Chenhall, 2003; Dekker, 2004; Henri, 2006; Langfield-Smith & Smith, 2003; Scheytt & Soin, 2006; 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 such data can reflect changes in MCS design and operational performance, which are needed to illustrate the impact of supplier cultural resemblance on the dynamics of the fit-performance association (Luo, 2002). Only by means of a longitudinal study, we are able to answer the call for more research on MCS dynamics (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.

4.2. 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 Belgian 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. Furthermore, VCG's culture is of the developmental type with a focus on flexibility and external parties. Besides theoretical

suitability, exploratory interviews with VCG management showed remarkable openness, interest in the research topic and willingness to cooperate.

Second, we chose the production facilities of two of VCG's first-tier module suppliers as supplying case companies.[51] Besides willing to participate, these high value-added just-in-sequence[52] suppliers met our theoretical suitability requirements. In particular, the suppliers are similar with respect to the four contingency variables, while they are very different with respect to their culture. More specifically, one supplier's culture is of the developmental type, resembling VCG's culture, while the other's culture is of the hierarchical type. That way, our choice enables us to adequately investigate the effect of high and low supplier cultural resemblance on MCS dynamics, while keeping contingency effects on the MCS constant. Obviously, these contingencies must considerably change over the period under study, so that we can study the effect of supplier cultural resemblance on MCS dynamics following a contingency change. Yet, the change in contingencies has to be similar for both suppliers under study to preserve a constant external effect over time. The introduction of two extra models at VCG met these requirements, as both suppliers faced similar changes in their situational characteristics.

4.3. Data collection

The data gathering consisted of 21 semi-structured interviews with high level managers of VCG, SAG1 and SAG2. Interviews were held in three rounds between February 2006 and December 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.

[51] For reasons of confidentiality, we call these production facilities "Supplier Automotive Gent 1 (SAG1)" and "Supplier Automotive Gent 2 (SAG2)". The mother company headquarters are referred to as "Supplier Automotive 1 (SA1)" and "Supplier Automotive 2 (SA2)". Concerning the delivered product, it suffices to know that both suppliers deliver 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", "Y" and "Z", instead of people's full last names.

[52] 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 SAG1 and SAG2 management. In particular, we asked them to describe the history of the VCG-SAG relation. As a result, we got the suppliers' impression of the relation with VCG, its history and its MCS, in the form of retrospective data. Third, we re-interviewed high level VCG managers specifically involved with both suppliers for several years. After asking them the same question, they added their view to the retrospective data of our study. Table 3.1 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.

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	3	92; 95; 137	15/02/2006; 18/04/2006; 21/11/2007
	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
SAG1	CEO SA1	1	68	17/12/2007
	Plant Manager	1	67	17/12/2007
SAG2	Plant Manager	3	106; 74; 116	13/03/2006; 18/04/2006; 26/11/2007
	Human Resource Manager	1	51	29/03/2006
	Quality Manager	2	125; 121	29/03/2006; 18/07/2007

Table 3.1: Interview data summary

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 and a quarter, 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.

4.4. 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 studies, 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 studies.

The coding of organizational culture required a specific approach, because our theoretical framework and therefore also our case study take on the research position of the manufacturer. This manufacturer knows its own organizational culture from the inside, but can only asses a supplier’s culture from the outside by considering supplier behaviour, resulting from the supplier’s cultural values. Yet, several supplier characteristics are

associated with supplier culture and indicative for supplier behaviour (Burton & Obel, 2004). Hence, from a contingency point of view, the manufacturer might use the following contingencies as an adequate means to assess a supplier's culture: structure[53], size[54], ownership[55] and nationality[56]. The more a supplier is structured as a bureaucracy, larger, publicly owned and from a country with strong uncertainty avoidance and high power distance, the more the associated supplier culture is of the hierarchical type. To illustrate VCG's usage of these contingencies, table 3.2[57] provides a sample of exemplary interview quotes out of our case data. Following our manufacturer research position, we use the same

[53] Structure refers to the degree to which a supplier's organization is structured as a bureaucracy (cf Perrow, 1970), which is characterized by a well defined authority hierarchy and high formalization, i.e. a large preference for rules and regulations (Burton & Obel, 2004). The more a supplier is structured as a bureaucracy, the more its underlying cultural focus lies on control and internal processes (Burton & Obel, 2004; Zammuto & Krakower, 1991).

[54] A supplier's size is positively associated with the level of procedure formalization and control sophistication. In addition, larger suppliers have a management style that is less personal and entrepreneurial and are less willing to cooperate with external parties. Consequently, large suppliers' cultures are characterized by a greater focus on control and internal processes than on flexibility and external parties (Burton & Obel, 2004; Chenhall, 2003; Miller, 1987; Park & Ungson, 1997; Shan & Hamilton, 1991).

[55] Privately owned suppliers have a different culture compared to publicly owned suppliers. Family firms are often in the business for generations and have developed sound relationships with all stakeholders. Furthermore, family firms put less pressure on short term performance, so that the adoption of good long term investments stays assured. So in terms of the CVM, a privately owned supplier is likely to prefer a developmental culture with a focus on external stakeholders and flexibility towards future performance increasing opportunities (Padgett & Mukherjee, 2006; Stein, 1989).

[56] A supplier's country of origin is associated with its organizational culture. When supplier headquarters are located in a country with strong uncertainty avoidance and high power distance, i.e. the two cultural values predominantly affecting organizational structure (Hofstede, 2001), the supplier has a preference for a strong bureaucracy with high formalization in a strict hierarchy. Hence, the associated supplier culture is of the hierarchical type with a focus on internal control (Aquilon, 1997; Burton & Obel, 2004; Lachman, Nedd & Hinings, 1994).

[57] When interviewees refer to "Volvo", they actually mean "Volvo Cars Gent" or (as we put it in the text) "VCG". The indication "[*number]" refers to a certain supplier, which name is not mentioned for reasons of confidentiality. Yet, for clarity, we provide the characteristics of these suppliers: [*1] = supplier with hierarchical structure, large, publicly owned, American; [*2] = supplier with horizontal structure, small, privately owned, German; [*3] = supplier with hierarchical structure, large, publicly owned, American; [*4] = supplier with horizontal structure, small, privately owned, Belgian; [*5] = supplier with hierarchical structure, large, publicly owned, American.

contingencies to assess SAG1's and SAG2's culture in terms of the CVM. Given the insights on a supplier's culture, a comparison with the manufacturer's culture, also in terms of the CVM, determines the degree of supplier cultural resemblance.

Contingencies	Interview Quotes (Source: VCG managers)
Structure	At [*1], the organization is ordered in pillars with a hierarchy. The JIS facility is put in one pillar or another, for example in the pillar Operations, next to the pillar Purchase and the pillar Sales. So, when something hurts in the other pillar, the JIS facility has no hold on that. At [*2], however, people say: "Your business is Volvo. Everything you need to do for that purpose, you must do. Do you have to go to Sweden? Go to Sweden. Do you have to go to Germany? Go to Germany. Do you have to call a supplier to your shop floor? Do that. Do whatever it takes." So, when the plant manager has some arguments, people listen to him. [...] Such approach is impossible in a pillar organization with a clear hierarchy. In such organization, the JIS facility is a small grain in the big block of Operations; not to mention that the facility would go to the block of Purchase or Sales. The JIS facility has little or no meaning. At [*2], however, a plant manager is a business manager, who has his business and has authority over it. He receives freedom of enterprise. […] The plant manager receives more opportunities to think out-of-the-box; out of his current system. In a pillar organization, a plant manager is only expected to be occupied with the JIS facility's current operations.
	Sweden is flat. The reason for that is that Swedish companies aim for a horizontal structure, in which everyone is equal before the law. […] Volvo fits between the Swedish and Belgian culture and is therefore flat. Just like in family firms, there is a quicker flow of information and a quicker building up of relationships.
	American companies are very hierarchical; German companies a bit less, although all the big ones follow the American pattern. That leads to a climate, in which the last link, the JIS facility, is considered a necessary evil to supply modules. So, people are avoiding that link as much as possible. At [*2], the reasoning is different: "If we install a JIS facility, we are going to make some kind of customer service centre of it. Our quality, our engineering and our support to the JIS facility will be enormous. That way, we are going to set up our satellite facility, positioned nearest to the customer, as good as possible."
Size	The supplying small and medium-sized enterprises of fifteen years ago now belong to big multinationals. That has little effect on local operational relations that still go by the same contacts, but has a huge effect on the settlement of potential difficulties, to which costs are attached. While previously such problems could be settled locally, those conversations are now held via a different structure. And in a large unwieldy organisation, it can take weeks or months to get through the organization and arrive at the right person.
	Volvo, me included, feared that this approach with fantastic service would change, now that we had to work together with a gigantic American organization. We expected that when Volvo would now have a question, [*3] would not answer with a simple "No". Still, we expected they would analyse the question, look what was in the contract, check up on what they had originally committed and verify whether they now fulfilled those commitments.
	A couple of JIS facilities belong to large American groups, which are even larger than Volvo. Consequently, these local facilities must implement the standard application of the group. Volvo can not ask a lot from those suppliers, because they follow their own path and, that way, try to shield off their territory. They do not want to learn from the smaller suppliers and do not allow the smaller suppliers to learn from them. Yet, this goes against the philosophy of the supplier team, which purpose is to make all suppliers cooperate as a group.
Ownership	A family firm has a broader picture. Furthermore, people in a family firm meet personally and frequently keep in touch with each other. For example, [*2] holds a yearly general assembly in Germany. [...] The conclusion was that they want to be a combination of the strength of a professional international multinational with the characteristics of a family firm, namely speed of work and openness in culture.

	If I am in a meeting with a family firm, there will always be someone of the family present; or at least someone who has something to say in the family. That gives the signal to the customer: "This is how it will be. Yes, we are going for it." That is the message. And that works faster. That leads to more flexibility, because the culture and structures are there to support it.
	Previously, [*4] was a family firm. […] The family characteristic led to the fact that Volvo only had to call the owner to get something done on a certain issue. In that case, everything had to give way to Volvo and everything immediately had to be put in order for the customer Volvo. That service was allowed to cost anything. Dealing with Volvo's issue became first priority, without any discussion.
Nationality	Apparently, national culture plays a role in the organizational culture of the local JIS facility and its mother company. Another factor potentially influencing organizational culture is the size of the organization. Such factors influence the organizational culture and that culture influences the speed at which the relation can switch to a friendly relation. […] As a result, our relation is smoother with a German family firm than with a big French multinational.
	The art of situational leadership fits in a culture like the Swedish one, which also influences Volvo and where an executive is called "coach". That signals: "we together". In American companies, there is no situational leadership, but domination. There, an executive is called "boss". That signals: "you alone". […] An American supplier will usually choose the business approach. The supplier only verifies an outside question by means of the contract. And when the question is judged as not their responsibility, the case is closed. A Swedish supplier, however, rather chooses the friendly approach. So, when a question enters the company, the supplier will only be satisfied when there is a solution for the question. For the supplier, it does not matter whether the question is their responsibility or not.
	[*5] is the house of distrust, while Volvo aspires the complete opposite. At Volvo, any employee can take decisions. At [*5], one needs five signatures of the top management. The reasons for that are the fact that [*5] is a very large organization and the fact that [*5] is an American organization, which only works by the rules. According to me, [*5] has loads of people writing books full of rules. […] Volvo, however, employs the consultation model with cooperation and helping each other.

Table 3.2: Exemplary interview quotes concerning contingencies associated with supplier culture

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 analyzing how change in an independent variable, i.e. MCS fit on risks, causes change in the dependent variable, i.e. operational performance (Langley, 1999; Rowe et al., 2008).

The case study and following discussion were approved for publication by VCG, SAG1 and SAG2, without having to make changes.

5. Case study

The case study section of this paper contains four parts. First, we describe VCG. We highlight organizational characteristics and behaviour, define VCG's culture, and present VCG's resulting supplier MCS. Second, we introduce two module suppliers with different cultural resemblance to VCG. We discuss the characteristics used by VCG to assess their culture and resulting behaviour. Third, we indicate to what extent the introduction of two new Volvo models changed the contingencies of both supplier relations. Based on the difference in supplier cultures, we propose different MCS dynamics. Fourth, we present the analyses of these dynamics, as result of the temporal bracketing and variance on actual case data.

5.1. Volvo Cars Gent

Volvo Cars Gent (VCG) was set up in 1965 as the largest assembly unit of Volvo Cars Corporation (VCC), a Swedish automotive OEM that produces cars since 1927. In 1999, VCC became part of the Premier Automotive Group, including Jaguar, Aston Martin and Land Rover, owned by Ford Motor Company, the world's third largest car manufacturer. In 2005, VCG employed 5.025 people, had a turnover of about €4,2 billion and produced 258.479 cars. VCG's organizational structure is horizontal and the counterpart of a bureaucracy with an authority hierarchy in vertical levels. This structure is associated with

VCC's Swedish nationality, as Sweden is characterized by low power distance and uncertainty avoidance. In Sweden, people are considered equal, which results in a preference for empowerment and collaboration in a horizontal structure. For example, a VCG superior leading a team is called "a coach" to stress his stimulating and supporting, rather than controlling, role. Furthermore, the Swedish culture is a "we" culture, in which friendships are established; also in business. In these friendships, honest open communication and mutual cooperation are preferred above avoiding uncertainty and refusing unselfish assistance. VCC's size sustains bringing this culture into the company. Despite being part of Ford's Premier Automotive Group, VCC remains a relatively small autonomous company with only two major production facilities. As a result, VCG formalization is limited and does not hinder the entrepreneurial spirit of employees at all levels, who freely interact with colleagues and coaches at VCG, VCC *and* suppliers.

Based on these characteristics, VCG's culture most closely resembles a developmental culture with a high focus on flexibility and external oriented values. Naturally, some focus on flexibility is obvious in an automotive setting with high flexibility requirements due to numerous model variants, fluctuating demands and continuous product and process changes. Yet, VCG's high focus on flexibility is visible in how the OEM deals with these requirements, namely by valuing empowerment. Instead of severely controlling employees, VCG grants them decision-making power to solve process changes and problems themselves based on their own expertise and lots of collaboration. As a result, VCG strongly values fairness, which means that employees are not penalized for making a mistake, but evaluated based on their behaviour in trying to resolve it. When employees openly communicate, quickly solve the problem and work on avoiding it in the future, VCG congratulates them with their way of action and does not punish them. In other words, VCG believes in human relations and values a spontaneous flexible response to situational changes at all company levels more than lower level obedience to control from the top.

The same flexibility orientation holds for VCG's just-in-sequence[58] suppliers. Instead of considering these supplier relations to be strictly business and focusing on the

[58] In order to reduce stocks and preserve maximum operational 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-

own internal operations, VCG largely focuses on external suppliers in search of continuous collaboration. The OEM finds that manufacturer and suppliers strive for a common goal, which is manufacturing as many products of the order book as possible, on time, with good quality and at the lowest possible cost. As a result, VCG considers the suppliers as part of the "Volvo family" and openly communicates with them on both difficulties and possible improvements. This supplier interaction occurs not only individually, but also jointly via the "Suppliers Team Volvo Cars" (STVC). The purposes of this supplier team, which meets monthly, are creating openness and sharing competencies, by the exchange of information and real life experiences, in order to improve the performance of all parties. As the STVC is actually run by the suppliers, VCG signals her place is *among* suppliers *instead* of *above* them.

Nevertheless, these suppliers are subject to a considerable amount of management control. Yet, this control bears the stamp of VCG's culture. With respect to formal control, VCG frequently checks up on supplier outcome by means of several quality and logistic KPIs, of which parts per million is the most important. Furthermore, the OEM controls supplier behaviour by means of a syllabus (agreements regarding basic routines of operational business), frequent supplier follow-up and supplier company visits. Although these controls reflect VCG's mechanistic control, they are influenced by VCG's focus on flexibility. For example, whether VCG imposes a penalty for causing a line stop (standard formal procedure) is always first negotiated with the supplier and then based on an assessment of the supplier's response to the issue. The empowerment and corresponding fairness values that underlie this behaviour towards suppliers correspond to VCG's values towards employees. Concerning behaviour control, VCG not only visits suppliers for control purposes, but also for collaboration. This cooperation coincides with open information sharing from VCG and the suppliers in order to stimulate flexible problem solving and creative continuous improvement based on *both* parties' expertise.

Yet, VCG's organic preferences are even more visible in the importance attached to informal supplier control; more specifically, trust building and clan control. First, VCG builds contractual trust based on prior positive experiences, so that the OEM trusts suppliers to execute oral and written agreements. Second, VCG also trusts suppliers to possess the necessary competences to deliver the goods as required and act on changes or

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sequence (JIS) suppliers.

improvements as promised. This competence trust is primarily built on past performance and suppliers' process certifications. Third, VCG continuously builds goodwill trust, i.e. the trust that the supplier openly and honestly communicates (even potential) delivery problems, which impact VCG and other JIS suppliers. This trust is increased by frequent interaction, and resulting bonds of friendship, with supplier managers, some already working with VCG for more than ten years. During this interaction, VCG continuously shares and promotes its norms and values, so that supplier managers are trusted to know that VCG values honest open communication more than opportunistic problem concealment. In addition, familiarity with the common goal and VCG's norms and values driving that goal makes suppliers feel related to VCG, like in a team or clan. Consequently, every supplier manager faces negative personal feelings, when confronted with (opportunistic) mistakes harming that goal. As JIS suppliers face daily operational snags requiring problem solving, they are highly subject to this social pressure. On top of these bi-directional informal controls, VCG uses the STVC to effectively structure the clan, so that both informal controls are strengthened and extended towards all JIS suppliers. By means of socializing activities like a joint lunch, the STVC magnifies bi-directional trust and creates multi-directional trust among all JIS suppliers. The STVC also builds trust via frequent information and knowledge sharing, joint decision making and joint problem solving. Based on this trust, VCG and the suppliers quickly and openly work on solutions for problems by helping each other, instead of placing blame and negotiating penalties. Additionally, the STVC clan strengthens VCG's social pressure on suppliers, because important supplier errors are reported and discussed at STVC meetings. The presence of all suppliers, towards which supplier managers are accountable, increases potential negative personal feelings and that way also the level of social pressure.

In sum, VCG's MCS shows the OEM's focus on flexibility and external suppliers. This MCS benefits from a resembling supplier culture that leads to corresponding behaviour. For example, VCG's STVC would not work without the willingness of suppliers to open up facilities during visits and share technical and managerial knowledge. In the next section, we introduce two module suppliers with a different degree of resemblance to VCG's culture.

5.2. Module suppliers SAG1 and SAG2

SAG1 and SAG2 are two suppliers delivering high value-added modules from a facility in VCG's supplier park. Their production processes involve complex core competences, which add considerable value to the modules. Because of JIS delivery, their interdependence with VCG is high. If one supplier disturbs the continuous delivery flow, not only VCG but also other JIS suppliers suffer. In addition, both suppliers must be highly flexible due to pull production and heavily fluctuating automotive demand. Together with the risk of VCG being closed down or VCC Purchase resourcing the module, this demand fluctuation results in high environmental uncertainty for the suppliers. Yet, as VCG is aware that the interdependence considerably impacts performance, the OEM strives for long term relational stability with both suppliers. Contrary to the supply relations with VCG that are similar, SAG1 and SAG2 have very different cultures, which VCG assesses by addressing their characteristics as described below.

The Belgian module supplier SAG1 was founded in 1996 as the joint venture of two automotive suppliers entering a new, yet related, business, in response to VCG's decision to outsource the particular module. One year later, the Belgian plant manager, Mr Z, had set up four similar companies supplying the same module to other OEMs, so that a mother company, SA1, was founded. In 2005, SA1 produced modules in 19 facilities world wide, with about 1.000 employees; despite the impressive growth rate, still a very small scale in automotive. All these years, SA1 has been led by Mr Z. Although he never owned SAG1 or SA1, he considers SA1 to be his own and receives full autonomous decision making power to act as SA1's owner. Consequently, SA1 resembles a privately owned company and Mr Z's business attitude completely permeated SAG1. That attitude is one of friendly relationships with lots of spontaneous bi-directional communication and collaboration at *all* levels with SA1 *and* VCG. As a result, SAG1 is part of a horizontal company structure, despite Belgian culture's high level of power distance and uncertainty avoidance. Hence, SAG1 has full responsibility for the organization of current production processes and the planning of upcoming project changes. Naturally, SA1 highly influences SAG1 production, for example with respect to continuous improvement, but always in a climate of bi-directional collaboration and agreement. Especially Mr Z frequently visits SAG1 personally to offer assistance, since SA1 headquarters are located near SAG1 and Mr Z feels highly connected as SAG1's original plant manager. That way, he makes sure that

SAG1's flexible focus on its customer VCG is adequately supported by SA1 at all times. In sum, SAG1's culture most closely resembles a developmental culture.

SAG2, however, has a completely different culture. This supplier was set up in 2000 as the production facility of SA2, a global American automotive supplier founded in 1943 and quoted on the American stock market. In 2005, SA2 operated 79 facilities in 25 countries on six continents with approximately 19.000 employees. Despite the American culture of medium power distance and uncertainty avoidance, SA2's structure is a bureaucracy with a hierarchy and high formalization, in which SAG2 only has responsibility for production and delivery according to strict rules and procedures imposed by SA2. This means that functions like finance and HR are centralised and that SAG2's plant manager only concentrates on budgeting and reporting. Furthermore, the SAG2 production process is designed and installed by SA2 engineers without SAG2 involvement. Taken together, these characteristics point at a hierarchical culture, focusing on controlling current processes, instead of responding flexibly to operational difficulties and improvements, initiated by external collaboration and often in need of financial investments.

5.3. Contingency changes

The previously described JIS supply relations refer to the situation in 2005. Yet, these circumstances followed a considerable change in contingencies in 2004. Before 2004, VCG operated in two shifts, manufacturing around 150.000 cars per year of two models (Volvo S60 and V70) on the P2 platform. In 2004, VCG started production of two extra models (Volvo S40 and V50) on another platform, P1. This substantially changed JIS supply relations. First, the level of task uncertainty increased, because production volume almost doubled (to around 250.000 cars per year), production activities became more complex, headcount increased and a third night shift was introduced. Second, task interdependence heightened due to an explosion of model variants and a considerable increase in JIS supply flexibility. Third, fluctuating demands for four Volvo models added to 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, so that suppliers were inclined to keep operational difficulties in-house and solve snags themselves. VCG's vulnerability towards this kind of opportunistic behaviour augmented. As JIS suppliers started to play a more

important role in VCG's supply chain, the automaker's striving for long term relational stability increased. Consequently, suppliers' 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 JIS supply relations. Hence, in order to preserve the MCS fit, VCG's level of management control must be increased.

Dependent on the degree of supplier cultural resemblance, we expect this MCS change to differ. As SAG1's developmental culture corresponds to VCG's culture, we expect VCG's MCS on SAG1 to need less time to adjust to changing circumstances. Oppositely, SAG2's hierarchical culture substantially differs from VCG's developmental culture. Hence, we expect VCG's MCS on SAG2 to need more time to adjust.

5.4. Case analysis of relation dynamics

The case data concerning SAG1 and SAG2 were bracketed into 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 analyses are 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 3.2 and figure 3.3 show a timeline that summarizes the results for each variable per time period from 2003 to 2006 for SAG1 and SAG2 respectively. Notice that performance is expressed in average parts per million (PPM) over the period under consideration. The level of this quality measure is visualized by means of a graph at the bottom of each figure. The high-low categorization in the tabular part of the figure results from comparing the average PPM with a pre-defined target.

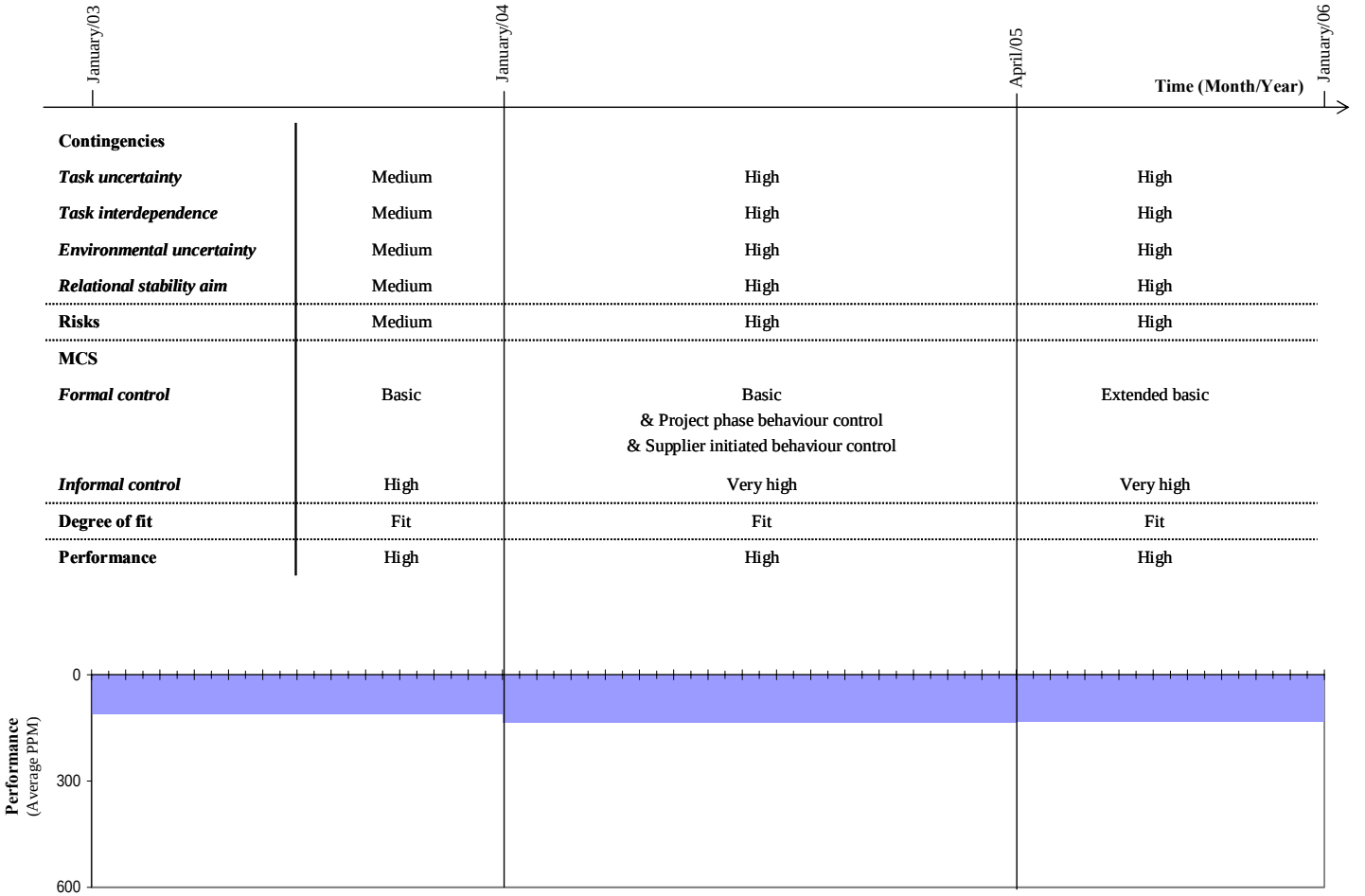

Figure 3.2: High cultural resemblance VCG-SAG1 MCS fit and performance consequences over time

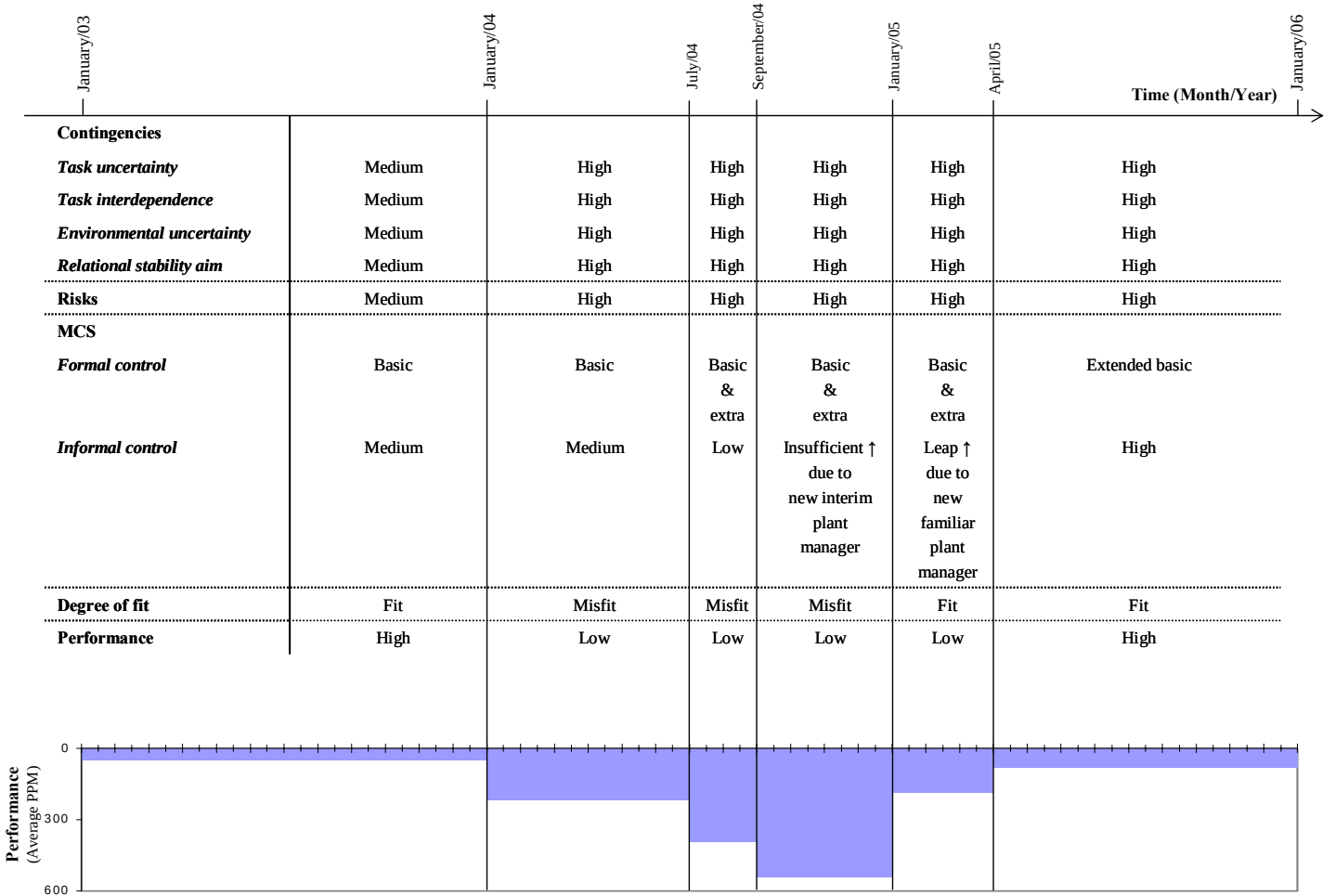

Figure 3.3: Low cultural resemblance VCG-SAG2 MCS fit and performance consequences over time

5.4.1. SAG1

Period 1 (September 1996 – December 2003)

From the start of production in 1996, SAG1 showed a consistently positive performance level. As VCG's values of an open collaborative focus on JIS suppliers fitted Mr Z's business attitude and SAG1's culture, SAG1 responded by developing (personal) relationships that allowed the sharing of information at all company levels and the building of trust. Mr Z and SAG1 felt part of the "Volvo family", which resulted in bi-directional collaboration. For example, when VCG experienced substantial difficulties with a newly designed automatic pallet transportation system for SAG1 modules, SAG1 proposed to help redesign the delivery system, despite full VCG responsibility for logistics. In particular, SAG1 assisted in designing a new system that included automatic truck loads via a "carpet"[59], automatic transport at VCG via a conveyor bridge and additional labels by SAG1. It must be clear that these changes required considerable financial investments from SAG1, especially for the carpet. Yet, Mr Z readily offered assistance and considered the investment obvious, given his strong relation with VCG. Hence, during the period 1996-2003, SAG1 became entirely aimed at satisfying all VCG needs as quickly as possible, irrespective of the cost.

These cultural values and corresponding behaviour made VCG built high competence and goodwill trust. For example, SA1 set up a department that collected difficulties of a certain JIS production unit, quickly proposed a solution and then distributed both problem and solution to all SA1 facilities. The same approach held for continuous improvement. When a process or product amelioration was realised at a certain JIS facility, this improvement was always shared with all JIS units via SA1. When a potential improvement was developed centrally, SA1 always first consulted VCG. Yet, when VCG approved the innovation and SAG1 implemented it, SA1 spread it to other JIS units. Based on the open relation with SAG1, VCG was familiar with this approach and therefore trusted SAG1 to perform to the best of their ability at all times and to openly communicate both

[59] This "carpet" is a kind of platform on which SAG1 places finished modules in-sequence. The carpet is electrically motorised and automatically loads the modules into a truck. At VCG a similar carpet is installed that automatically unloads the truck. As the modules are in-sequence, they are directly transported by a conveyor bridge to the module build-in station of the VCG assembly line.

internally with SA1 and externally with VCG. For example, when SAG1 adapted the outbound stock balance, VCG was informed and asked for their approval. Besides trust building, also social pressure was considerable present, especially on Mr Z. Mr Z and Mr X, a VCG supplier expert, developed a personal friendship, which resulted in the joint creation of the STVC together with two other supplier plant managers. As Mr Z even chaired the STVC for about one and a half years, it must be clear that his support, and therefore his susceptibility to social pressure, were very high.

VCG's formal controls mainly focused on outcome KPI's (primarily PPM) and compliance with delivery rules and regulations drawn up in SAG1's syllabus.

Period 2 (January 2004 – March 2005)

To preserve a MCS fitting the increased level of risk, resulting from the contingency changes in January 2004, VCG had to raise the level of management control. With respect to formal control, VCG set up cross-functional workgroups one and a half year upfront to control the VCG-SAG1 interface (e.g. information exchange and logistics) and make sure the supplier would be capable of handling the new module supply. The main type of information for this project phase behaviour control was an electronic flowchart (Excel file) clarifying the project phases and formulating related questions, to which the supplier had to provide the answer. In addition, the supplier also had to score the progress on every question, ranging from green (question completely in order; no further sub-questions to or from VCG/VCC) over orange (question not in order; issues need to be dealt with or sub-questions need to be answered; yet no problem considering phase deadline) to red (question not in order and some problem; e.g. answer to (sub-)question unknown or insufficient information available). Every month, the supplier plant manager had to deliver an update of the flowchart to VCG and VCC. When a question was marked red, VCG/VCC addressed the supplier on this problem during the next "launch readiness review" meeting at VCG. The problem was discussed and a solution was agreed upon. Hence, the flowchart's main goal was informing VCG/VCC engineers of the supplier's project preparation progress and status. Yet, for this behaviour control to work properly, the supplier's answers and scores had to honestly reflect reality. At SAG1, this was not an issue, as the supplier strongly valued open communication and even considered the flowchart a very helpful tool for the *own* planning and project follow-up. Consequently, a green score on a flowchart question regarding employee training on new procedures really meant that SAG1 had communicated all new procedures and trained all (new) employees involved. That way, VCG effectively

controlled the VCG-SAG1 interface during the project phase.

SAG1's open relationship with lots of interaction created opportunities for VCG to exercise additional behaviour control on SAG1's internal production processes. During the project phase, SAG1 regularly invited VCG and VCC managers to SAG1 to explain *and discuss* how changes to internal processes were made. To that end, SAG1 management really anticipated VCG questions and prepared the answers in advance. Also VCG shop floor employees were invited to SAG1, as SAG1 considered it important for them to know SAG1 activities and meet SAG1 employees, with whom they would interact.

Mr Z and some SA1 managers always attended these visits, to show SA1's attention for the upcoming changes. Despite substantial extra costs, these changes were implemented in two phases, because SAG1 considered the risk of a complete line change too high. In addition, SAG1 installed extra production capacity to cope with interruptions, which always occur when production processes are radically changed. Furthermore, SAG1's plant manager attended monthly VCC and SA1 R&D meetings. As a result, this manager already responded to potential production difficulties during the design phase and received VCC information first hand as quickly as possible. That way, he was best positioned to assist SA1 and supervise SAG1's new production lay-out, so that all operational processes and procedures supported production of the new modules. Moreover, SAG1 management even anticipated on serious failures harming VCG delivery. An illustrative example was the installation of an extra carpet to load trucks. Until 2004, SAG1 only possessed one carpet, so that in case of a carpet failure VCG delivery would inevitably halt. Due to the changed contingencies, SAG1 managers *themselves* assessed the risk of stopping the VCG line due to a carpet failure as unacceptably high. Therefore, they demanded SA1 financial resources for an additional carpet. As Mr Z was aware of the highly interdependent production environment and the social consequences of a VCG line stop on SAG1's management and their reputation, he almost instantly granted SAG1 the resourced needed. So, without an actual carpet failure having caused a VCG line stop in the past, SAG1 installed an additional one, only to prevent VCG delivery from suffering from a potential carpet failure in the changed circumstances. Taken together, these signals built additional competence trust, on top of the considerable level VCG developed in the past.

Hence, VCG's MCS *immediately* followed the increase in risk based on behaviour control and trust building *actually* taking place *before* the contingencies changed. That way, VCG preserved a MCS fit, which was expected to sustain SAG1's performance based on

the framework. And indeed, after the start of production, SAG1's new module delivery did not run into substantial problems, so that its performance level remained outstanding.

Period 3 (April 2005 – …)

Following the 2004 situational changes and resulting difficulties at certain JIS suppliers (other than SAG1), VCG extended its basic formal control on SAG1 to fit the new production environment. Although already implemented in practice, the following extensions were confirmed in 2005: registration and evaluation of two logistic KPIs, namely 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), strict application of the penalty system (including the negotiation policy) and more frequent supplier outcome and behaviour follow-up. Combined with the very high level of informal control, VCG used these extended formal controls to govern the high level of risks. Hence, consistent with theoretical expectations, SAG1 retained its excellent performance.

5.4.2. SAG2

Period 1 (January 2000 – December 2003)

From the start of production in 2000, SAG2 was an exemplary supplier with performance well above target. VCG's MCS appeared to fit the supplier's risk 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, SAG2's start-up and production did not create large problems, for which open and honest communication combined with collaborative problem solving were needed. On the other hand, SAG2's plant manager was completely unknown to VCG, as he was only sent on secondment from another SA2 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 SAG2 management, so that also social pressure possibilities were limited. Because nothing disturbed SAG2 delivery, VCG left the supplier alone.

Period 2 (January 2004 – June 2004)

Following the contingency and risks increase in January 2004, VCG had to raise the level of management control to preserve a MCS fit. However, neither formal nor informal controls were considerably heightened. With respect to formal controls, VCG did set up

cross-functional workgroups and required SAG2 to report project progress by means of the electronic flowchart, but got deceived. While SAG2's information provision to the workgroups and SAG2's answers and scores on the flowchart questions told VCG that all necessary changes were made and issues were getting solved, the supplier actually neglected implementing the changes. Furthermore, the supplier neither communicated the changes in the organization, nor trained the employees. The fact that SAG2 did not participate in the design and implementation of the new production system, but simply received all installations from SA2 engineers, contributed to this negligence. SAG2 managers, for example, had no contact with SA2 engineers, not to mention the VCC R&D department. Consequently, VCG approved an operational plan that did not reflect reality, and that way missed out on additional project phase behaviour control. Furthermore, VCG considered SAG2 to be manageable by a less experienced quality engineer based on the competence trust in SAG2.

However, VCG did not receive any signals that SAG2 would be able to effectively handle the heightened supply requirements. For example, VCG did not get the impression that SA2 had worked hard to prepare SAG2. SA2 engineers had implemented the new production system at SAG2, successfully produced a couple of test modules, but then left. VCG neither received news about an extra production or quality engineer to ensure production quality in the new substantially more complex production system. In fact, SAG2 communication was limited to the strictly necessary and did not include inviting VCG to SAG2 and discussing the upcoming changes with all people involved. Thus, VCG 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 SAG2 were not heightened either and remained low. Hence, VCG's MCS did not follow the increase in risks and evolved into misfit. Based on the framework, we expect this situation to deteriorate SAG2's performance, which is exactly what happened. After the start of production, SAG2 struggled to fulfil the agreements made during the project phase and damaged VCG's competence trust.

Period 3 (July 2004 – August 2004)

VCG responded by 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

collaborative behaviour control was hampered by SAG2's opportunistic behaviour. Instead of responding openly and honestly to VCG concerns and accepting the assistance offered, SAG2 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, SAG2'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 monitored every detail of SAG2's output and operational process. Those controls proved VCG's remaining competence trust undeserved, as SAG2 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 demanded active involvement from SA2. As a result, SAG2 got a new interim plant manager from another facility and operational assistance. That way, VCG tried to reinstall a sufficient level of trust in SAG2, because as long as the level of informal control did not fit the heightened level of risk, the framework predicted difficulties to remain. As the first plant manager was replaced by a new interim plant manager, who received SA2 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 unsuited as control instrument. Moreover, the fact that he only became *interim* plant manager reflected that he did not like being detached to SAG2. In other words, VCG only restated little trust in SAG2, so that the informal control insufficiently fitted the increased risks and continuing difficulties could be foreseen. Indeed, despite a slight performance increase and improved VCG access to SAG2's shop floor, SAG2's performance progress was too slow. 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-SAG2 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 SA2. 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 were sufficiently high to fit the MSR's risk. 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 together, 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 SAG2'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. SAG2's first plant manager was only sent on secondment and did not engage in STVC meetings, while the second one was too occupied trying to restructure SAG2 and not interested in the STVC due to his temporary statute. Mr Y, however, already consistently participated in overall STVC meetings and chaired the IT workgroup. That way, the STVC contributed to VCG's trust in Mr Y and increased social pressure of both VCG and JIS suppliers. These heightened informal controls fitted the high risk 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, SAG2 realised a considerable turnaround.

Period 6 (April 2005 – …)

Consequently, VCG rapidly cut back formal controls. In fact, VCG lowered all extra controls from the moment SAG2 showed substantial improvements, building sufficient competence trust. Hence, formal control was put back to basic control resembling the

period 2000-2003; yet slightly extended, as VCG continued registering line stop minutes and dropped cars, 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, SAG2 regained its outstanding performance already one year later.

6. Discussion

Previous case findings confirm our theoretical propositions. First, VCG's developmental culture strongly influences the supplier MCS, as suggested by Chenhall (2003) and Scheytt & Soin (2006). More specifically, VCG's MCS shows the OEM's focus on flexibility and external suppliers by means of organic influences on formal controls, an important role for informal controls and the installation of the STVC, which builds a clan and extends informal control to all JIS suppliers. Second, the functioning of the MCS benefits from a resembling supplier culture, which supports propositions of Harrison & McKinnon (1999) and Henri (2006). When module supply contingencies and risks increased in 2004, VCG's MCS needed to follow this increase in order to preserve a MCS fit, associated with good operational performance. VCG's MCS on SAG1, a supplier with a similar culture, changed very rapidly, contrary to the MCS on SAG2, a supplier with a hierarchical culture. In fact, VCG's MCS on SAG1 was heightened during the project phase *before* the start of production, so that the risk increase in January 2004 was *immediately* subject to more control. Oppositely, SAG2's MCS only grew about six months *after* the production start-up and then needed six more months and three attempts to get fitted on the new situation. That way, our case confirms alliance research findings of White & Lui (2005), associating this timing difference with a difference in partner's cultural resemblance. Third, the case clearly shows *how* high cultural resemblance contributed to VCG's speed of MCS change. As argued by Bierly III & Gallagher (2007), VCG was able to evaluate SAG1 *earlier* than SAG2, i.e. during the project phase, by means of three *mechanisms* that enhance management control. Although these mechanisms result from our case data, they correspond to earlier findings in the literature, which supports their external validity.

First, VCG's external focus resulted in increased behaviour control by means of setting up cross-functional workgroups and requiring the supplier to communicate via an electronic flowchart. The fact that the supplier plant manager filled in the flowchart himself

followed VCG's focus on flexibility. As SAG1's developmental culture resulted in honest answers and even appreciation for the flowchart's usefulness, VCG successfully increased behaviour control on SAG1. SAG2's hierarchical culture, however, resulted in answers and scores that did not reflect reality. That way, VCG failed to increase behaviour control on SAG2. In other words, SAG1's resembling culture heightened the effectiveness of VCG-SAG1 communication by reinforcing *proper information exchange* towards VCG's flowchart control technique. A similar positive influence of cultural resemblance on the level of behaviour control is proposed by Aquilon (1997) and Luo (2002).

Second, VCG was able to increase behaviour control on SAG1's internal processes due to *increased communication.* Although also this effect of cultural resemblance is documented in the literature by Chen, Chen & Meindl (1998) and McAllister (1995), our results add that not VCG, but *SAG1* took the *initiative* for the increased communication. Because of its developmental culture, SAG1 offered opportunities to strengthen the open personal relationship with VCG by inviting VCG managers and shop floor workers. During these visits, VCG met SAG1 and SA1 managers, who showed and discussed upcoming changes and instantly answered expected VCG questions. So besides socializing, VCG controlled SAG1 activities and made suggestions for improvement by interacting with well informed supplier employees at the supplier facility, which are VCG's preferred circumstances. SAG2, however, did not invite VCG personnel to the supplier facility during the project phase, as SAG2's hierarchical culture did not focus on VCG involvement and VCG did not demand such visits.

Third, VCG's trust building in SAG1 and SAG2 substantially differed. Consistent with prior literature (Das & Teng, 1998; Luo, 2002), VCG built more trust in SAG1 based on SAG1's resembling cultural values. This cultural resemblance eased cultural blending, so that socialization between VCG and SAG1 was strengthened and values and norms were shared more easily. The resulting inter-organizational familiarity helped building trust. Similar insights can be found in the literature. For example, Gulati (1995) finds that lower cultural inconsistency between alliance partners leads to less equity based alliances with more trust. For MSRs, this means that VCG will have more confidence in its ability to predict supplier behaviour, if both parties' cultures are more resembling (Bierly III & Gallagher, 2007; Park & Ungson, 1997). In the VCG-SAG1 relation, this confidence resulted from several competence *trust enhancing signals*. Supported by SAG1's large focus on VCG and resulting interaction, these signals confirmed that the supplier was

willing to invest in the relation (van der Meer-Kooistra & Vosselman, 2004). SA1, in particular the "owner" Mr Z, provided SAG1 with considerable attention and financial resources to cope with unforeseen difficulties and to keep monthly contact with VCC's R&D department. So besides enhancing behaviour control, SAG1's cultural resemblance facilitated trust building (Luo, 2002). From SAG2, however, VCG did not receive any signals to increase trust. In fact, when SAG2 got into a position to signal competence, i.e. when there was full running production and SAG2 ran up against the first difficulties, SAG2 damaged VCG's competence trust by showing a lack of preparation and learning capacities. The same holds for VCG's low level of goodwill trust, which entirely evaporated when SAG2 acted opportunistically by refusing timely communication and openness on issues that VCG wanted to discuss.

Taken together, VCG's MCS on SAG2 was not changed at the start of production, so that it got into misfit and contributed to a decrease in performance, as proposed by the theoretical model. Indeed, comparing SAG2's degree of MCS fit and performance provides considerable evidence of the fit-performance association, underlying previous inter-organizational MCS studies like Dekker (2004). In 2004, SAG2 struggled after starting module production and delivery for two new extra Volvo models. As VCG's MCS no longer fitted SAG2'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 the VCG-SAG2 relation effectively illustrates the fit-performance association. That way, we support earlier findings of Ittner et al. (1999) and Anderson & Dekker (2005), stipulating that a MCS fitting situational characteristics benefits performance. Nevertheless, our longitudinal data on several periods refine their findings with respect to the actual 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, but took VCG several attempts.

VCG's final attempt implied actively and deliberately influencing supplier decision making to install a plant manger of their choice, in particular Mr Y, who VCG already trusted highly because of many years of experience and STVC involvement. In addition, Mr Y was susceptible to social pressure due to his personal relation with VCG

managers, good reputation and active involvement in the STVC. That way, 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 and revived SAG2's performance. A close examination of our data learns that this informal control increase via Mr Y coincided with Mr Y initiating a *change* in SAG2's culture. As head of SAG2, Mr Y lowered SAG2's hierarchical structure. To that end, he eliminated the level of shop floor team leaders and started to frequently visit the shop floor himself to discuss issues directly with shop floor workers. These changes are associated with Mr Y managing SAG2 like it was his own company. Mr Y worked day and night to resolve recurring problems and to search for their causes in open collaboration with SAG2 shop floor workers and VCG staff. Previous SAG2 plant managers neither put in that much effort, nor allowed large VCG involvement due to a different management style. This style complied with SA2's tight job description, which was in line with SA2's American culture. Mr Y, however, was well aware of the difference between SA2's culture and his own business attitude. Therefore, he deliberately reacted against SA2's cultural influence and shielded SAG2 from it as much as possible. VCG's pressure on SA2 to finally resolve SAG2 production difficulties and to support Mr Y in changing SAG2 helped Mr Y to successfully introduce his values in SAG2. To that end, he pushed through his business attitude on his new group of middle level managers. That way, Mr Y initiated a shift in SAG2's culture from a hierarchical culture towards a developmental culture. Thus, assisted by the CVM conceptualization of organizational culture, our case demonstrates *cultural dynamics*, on which further study was called for by Baskerville (2003) and Harrison & McKinnon (1999). Furthermore, our data confirm that the relation between organizational culture and management control is not a simple matter of cause and effect (Henri, 2006; Scheytt & Soin, 2006). In fact, we find that VCG's MCS influenced the degree of SAG2's cultural resemblance by adapting the supplier's culture via its plant manager Mr Y.

Still, this influence on SAG2's culture was the result of a substantial difference in organizational culture, on which VCG had no control.[60] Indeed, given VCG's developmental culture, the OEM was lucky to work with a developmental supplier as

[60] VCG lacked this control, because the OEM was not responsible for supplier choice, on which the VCC purchase department decided. Consequently, VCG had no other choice than to work with the supplier appointed by VCC and deal with its organizational culture.

SAG1, but just as well had bad luck to work with a hierarchical supplier as SAG2.[61] Consequently, the awareness of the influence of supplier cultural resemblance on the speed of MCS increase might have helped VCG. Indeed, comparing SAG2 and SAG1 MCS dynamics illustrates that SAG2's lack of control was associated with SAG2's low cultural resemblance. Given awareness of this association, VCG managers might have responded by anticipating slower MCS dynamics when contingencies changed and installing additional management control.

Yet, to that end, VCG first needed to be aware of their own values, the values on which the suppliers relied and resulting differences, as proposed by Ireland (2002) and confirmed by Henri (2006). VCG employees considered themselves as a family, also with respect to suppliers, on which they strongly focused via the STVC. A supplier like SAG1, with a resembling culture, responded to this behaviour by acting as part of the family. A supplier like SAG2, with a different culture, thought of VCG as the customer, which was not allowed to get involved in the supplier's functioning. Assessing this kind of supplier values would have benefited VCG's awareness of cultural differences. In that respect, our case confirms the usefulness of applying the CVM for describing organizational culture (cf Bhimani, 2003; Henri, 2006). Based on the CVM model, we were able to clearly distinguish the difference in cultural resemblance between SAG1's developmental culture and SAG2's hierarchical culture, compared to VCG's developmental culture. That way, VCG managers have a specific means to assess a supplier's degree of cultural resemblance.

Besides demonstrating the need for VCG awareness on a supplier's cultural resemblance, the SAG2 case also shows the importance of VCG awareness on the role of informal control, especially in times of important changes. During SAG2's problem escalation, VCG managers were not sufficiently aware of the fact that they needed to heighten informal control on SAG2 by *reinstalling* more trust and *installing* social pressure. Despite VCG emphasising the reliance on personal relations and informal control, they really ignored this part of their MCS on SAG2. Consequently, they needed two

[61] Based on previous case study and case analysis, it might seem that we have a preference for a developmental culture with open collaboration, linked to a relatively small scale privately owned horizontal organization. Yet, that is not the case. The point at issue is that VCG has a developmental culture and therefore a specific MCS with certain behaviour towards suppliers. Depending on whether the supplier's culture resembles VCG's developmental culture, this MCS will change faster. Thus, given VCG's developmental culture, VCG's MCS is better off with a supplier like SAG1, which has a resembling developmental culture.

unsuccessful attempts and faced increasing delivery problems, before they effectively increased informal control on SAG2 via its plant manager to fit the level of risks. So, without awareness on the reliance on informal control, the importance of increasing informal control is 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 manufacturer and supplier management interacting with each other. Only that way, informal control, especially trust building, will not result in time losses when difficulties arise. As argued in the literature (Bierly III & Gallagher, 2007; Heikkilä, 2002; Stalk 1988), these time losses must be avoided to stand up to the fierce competition in the current economic (automotive) environment.

7. Conclusion

This paper contributes to the inter-organizational management control literature by exploring the impact of cultural resemblance on the management control of manufacturer-supplier relationships. Although MCSs are contingent on situational characteristics and this contingency fit is associated with good performance (Donaldson, 2001), it remains unclear which variables contribute to the speed of MCS change, so that temporary misfits due to changing circumstances are less likely to occur (van Veen-Dirks, 2006). Further research on these variables is justified, as a MCS misfit and associated decreasing operational performance might harm any manufacturer, until the misfitted MCS is changed towards a more appropriate design (Dekker, 2004; van Veen-Dirks, 2006). Organizational culture, in particular the degree of supplier cultural resemblance to the manufacturer's culture, is proposed to be such a variable due to its impact on the design and use of the MCS (Chenhall, 2003; Harrison & McKinnon, 1999; Merchant, 1998; van der Meer-Kooistra & Vosselman, 2000). Also in strategic alliances, cultural differences between interacting parties make the alliance difficult to manage (de Rond, 2003; White & Lui, 2005) and may negatively influence performance (Dekker, 2004; Ireland, 2002; Kale et al., 2000). Hence, further research is called for on the role of organizational cultural resemblance in the MCS fit-performance association (Harrison & McKinnon, 1999; Henri, 2006), especially for other types of IORs, like MSRs, for which this type of research remains scarce (Chenhall, 2003; Scheytt & Soin, 2006). The preferable method for such research is a qualitative case study, aiming to obtain an in-depth insight into the case companies' cultures and compare the impact of different degrees of supplier cultural resemblance on the dynamics of MCS

design in times of changing circumstances (Anderson & Dekker, 2005; Chenhall, 2003; Henri, 2006; Scheytt & Soin, 2006).

Therefore, we studied changes in two similar high value-added just-in-sequence MSRs that differ with respect to cultural resemblance in the manufacturing phase of the supply chain, relatively under-explored in the inter-organizational management control literature (Cooper & Slagmulder, 2004; Langfield-Smith & Smith, 2003). More specifically, we investigated the relations between a Volvo Cars facility (VCG) and two module supplier facilities (SAG1 and SAG2) in the automotive industry, characterized by competitive pressure and continuous improvement (Carr & Ng, 1995). To refine inter-organizational management control theory, we proposed a theoretical contingency framework including the dynamic associations between supplier cultural resemblance, MCS design, degree of MCS fit on contingencies and risks, and operational performance. The real contribution of our case study followed from its longitudinal design, because only this design allowed effectively exploring the impact of cultural resemblance on the timing of MCS changes and the impact of fit on performance in the course of time, following a severe contingency change. The theoretical proposition was that supplier cultural resemblance is positively associated with the speed at which the MCS changes, so that it keeps (or quickly regains) its fit in case of changing contingencies.

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 theoretical proposition. The functioning of VCG's MCS benefited from a resembling supplier culture, as proposed by Harrison & McKinnon (1999) and Henri (2006). As SAG1's culture resembled VCG's culture, upcoming contingency changes were appropriately anticipated by increased management control during the project phase, before contingencies actually changed. Consequently, the higher level of management control immediately fitted the risks increase at the start of production and contributed to sustaining good performance. Oppositely, SAG2's culture differed from VCG's culture, so that adjusting SAG2's MCS to the changing circumstances required more time. In particular, SAG2's level of management control only grew about six months after the start of production and then needed six more months and three attempts to get fitted on the new situation. As proposed, the resulting MCS misfit contributed to escalating operational difficulties, until VCG changed the MCS. In sum, this twofold case study illustrates the substantial impact of resembling organizational cultures on the timing of MCS changes in

MSRs and therefore supports prior alliance research findings of White & Lui (2005). In addition, the VCG-SAG2 relationship provided considerable evidence of the dynamic fit-performance association, as assumed by e.g. Dekker (2004). By showing that operational difficulties followed a MCS misfit, while operational improvements only set in when the MCS fitted the new situation, we support and refine earlier findings of Ittner et al. (1999) and Anderson & Dekker (2005).

Furthermore, the case clearly showed how high cultural resemblance contributed to VCG's speed of MCS change. As argued by Bierly III & Gallagher (2007), VCG was able to evaluate SAG1 *earlier* than SAG2 based on three management control enhancing *mechanisms.* Although these mechanisms result from our case data, they correspond to earlier findings in the literature, which supports their external validity. First, VCG increased behaviour control on SAG1, because SAG1's resembling developmental culture led to *proper information exchange* towards VCG's flowchart control technique (Aquilon, 1997; Luo, 2002). Conversely, SAG2's hierarchical culture led to answers and scores that did not reflect reality. Second, SAG1's resembling developmental culture made the supplier invite VCG managers and shop floor workers to control SAG1 activities and make suggestions for improvement. Consequently, VCG's behaviour control on SAG1's internal processes was increased due to *increased communication* (Chen et al., 1998; McAllister, 1995) *on the initiative of the supplier*. Third, VCG built more trust in SAG1, the supplier with resembling culture, consistent with prior literature (Bierly III & Gallagher, 2007; Das & Teng, 1998; Gulati, 1995; Luo, 2002; Park & Ungson, 1997). To that end, VCG received several competence *trust enhancing signals* (van der Meer-Kooistra & Vosselman, 2004) due to SAG1's large focus on VCG and resulting interaction.

Finally, the VCG-SAG2 relation showed a very specific management control technique, namely deliberately influencing supplier decision making to install a new plant manager (Mr Y) of the manufacturer's choice and that way influencing the supplier's culture. The first finding made us conclude that VCG created an adequate environment for SAG2's turnaround by specifically choosing Mr Y and instantly increasing the level of informal control to fit the new situation. The second finding learned that Mr Y initiated a shift in SAG2's culture from a hierarchical culture towards a developmental culture. In other words, VCG's MCS influenced the degree of SAG2's cultural resemblance by shifting its culture via its plant manager. That way, our case demonstrated cultural dynamics, as called for by Baskerville (2003) and Harrison & McKinnon (1999) and

confirmed that the relation between organizational culture and management control is not a simple matter of cause and effect (Henri, 2006; Scheytt & Soin, 2006). Obviously, these findings benefited from conceptualizing organizational culture via the CVM, as this model clearly distinguished SAG1's developmental culture and SAG2's hierarchical culture and allowed culture to shift by means of the notion of dominant types. That way, our study contributes to the literature by demonstrating the usefulness of applying the CVM for describing organizational culture in qualitative studies, as proposed by Bhimani (2003).

Besides researchers, also manufacturer management might use the CVM and associated supplier characteristics as a mean to assess supplier cultural resemblance. Yet, to that end, managers first need to be aware of the importance of such assessment. Undoubtedly, this awareness forms an important lesson of this study for VCG and other manufacturers. In particular, they should be aware of the influence of supplier cultural resemblance on the speed of MCS dynamics, in case contingencies change. That way, slower MCS changes can be anticipated and responded to by installing additional controls. To that end, the manufacturer needs to be aware of the own values, the values on which the suppliers rely and resulting differences, as proposed by Ireland (2002) and confirmed by Henri (2006). Finally, the SAG2 case also shows the importance of awareness on the role of informal control, especially in times of important changes. During SAG2's problem escalation, VCG managers were not sufficiently aware of the fact that they needed to heighten informal control on SAG2, so that they needed two unsuccessful attempts and faced increasing supply problems. Hence, only by being aware of the reliance on informal control, this control type, especially trust building, will not result in time losses when difficulties arise.

Although the case study method was specifically chosen for its methodological qualities for studying the dynamics of an extensive MCS, we acknowledge studying only two supplier relationships of one manufacturer hampers generalizing our findings. First, it is uncertain whether a different manufacturer, whether or not with a differing culture, would lead to similar results. For example, it remains unclear whether manufacturers without a supplier team, which provides the opportunity to build personal relations with supplier managers, are able to choose supplier managers to their advantage. Second, we have no idea to what extent our findings hold for other types of MSRs than the two high value-added JIS MSRs in our case. Third, theoretical suitability made us chose two MSRs that extremely diverged with respect to supplier cultural resemblance, so that a comparison

would lead to substantially different insights. Yet, at the same time, these extreme MSRs might not be representative for other MSRs. Fourth, we do not exactly know to what extent the learning curve impacted the performance of SAG1 and SAG2 when contingencies changed. Before the changes in 2004, SAG1 successfully completed a start-up in 1996 and a new Volvo model introduction in 2000, while SAG2 only successfully completed the start-up in 2000. Also the turnaround of SAG2 performance in 2005, after Mr Y took over, might be influenced by organizational learning. Fifth, we abstracted from previous supply chain phases, like procurement and R&D, so that it remains unclear to what extent these supply chain phases impact the supplier relationships during manufacturing. Nevertheless, the limited generalizability immediately offers 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.

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 SAG2 managers, so that their perceptions on the events were not available. A real-time study could cope with these limitations.

A third avenue for further research could investigate the effect of cultural differences between other culture types of the CVM. Our study focused on the comparison between hierarchical and developmental culture, following its explicative power in the study of Bhimani (2003). Hence, whether comparisons between other culture types, like group versus rational or group versus developmental, fit our theoretical model and lead to similar results remains unknown. Moreover, this future research stream might benefit from introducing a completely different conceptualization of organizational culture, for example based on the "Organizational Culture for Diversity Inventory" (OCDI) (Cooke and Szumal 1993; Whitfield & Landeros, 2006), and investigate whether this conceptualization leads to different results.

Fourth, further research might take on the position of the supplier, contrary to this

paper's position of the manufacturer. Insights from a culture assessment from within the supplier, instead of an assessment from the outside, might shed more light on the role of cultural resemblance in MSRs. For example, prior research found that buyer and supplier have different perceptions about their relationship (John & Reve, 1982). In case that perception difference also concerns each other's culture, it might influence MCS dynamics.

A fifth research avenue could examine the impact of supplier cultural resemblance on the level of risks. This theoretical association was not included in our model due to our conceptualization of risk, namely *objective* risk, inherent in a given MSR and influenced by four supply contingencies (Das & Teng, 2001). This objective risk is not associated with supplier cultural resemblance. Yet, *subjective* risk, i.e. the manager's estimate of objective risk (Das & Teng, 2001), might be. Because of a lower level of supplier cultural resemblance, the manufacturer might perceive the level of risks higher, given the same level of contingency variables. By way of illustration, consider the VCG-SAG2 relationship in 2004. Assuming that VCG was sufficiently aware of the cultural differences (which in reality was not the case), VCG might have perceived SAG2 as unable to adequately cope with changes imposed by the manufacturer, which would have increased perceived performance risk (McAfee, Glassman & Honeycutt Jr., 2002). In addition, VCG might have perceived SAG2 as unable or unwilling to openly interact and communicate with VCG, which would have augmented perceived relational risk (Luo, 2002). It must be clear that our study was unsuited to investigate the association of supplier cultural resemblance and perceived risks, as we examined events as objectively as possible after they occurred. Our focus lied on inherent risks only, in order to gain an understanding of the existence of these risks in the absence of any management controls (cf Anderson, Christ & Sedatole, 2006). Nevertheless, the association between supplier cultural resemblance and subjective risks is worth studying, maybe by means of a survey, which could ask manufacturer staff to grade their perceived risks on a (e.g. seven-point) Likert-scale. Subsequently, this survey would allow a quantitative analysis of the potential mediating impact.

A sixth and final avenue for further research might examine other potential MCS influencing variables not addressed in this study. Two of those variables might be relationship length and fair benefit sharing, already proposed to be influential by Dekker (2004), Gietzmann (1996), Tomkins (2001) and van der Meer-Kooistra & Vosselman (2000).

General conclusion

The general purpose of this doctoral dissertation is to contribute to the unravelling of MCS design for supplier relationships in the manufacturing phase of the supply chain. As the economic environment demands an effective supply chain, supplier relationships have a high potential impact on performance, if effectively governed (Anderson & Dekker, 2005; Ittner et al., 1999). Nevertheless, inter-organizational MCSs only recently received substantial interest in the literature (Dekker, 2003). As a result, the role of inter-organizational MCSs has been studied from several angles, including outsourcing relations (e.g. Langfield-Smith & Smith, 2003), inter-organizational cost management relations (e.g. Cooper & Slagmulder, 2004), strategic alliances (e.g. Dekker 2004), and joint ventures (e.g. Kamminga & van der Meer-Kooistra, 2007). Yet, the main emphasis lied on relational collaboration during the procurement and R&D phases of the supply chain. Although this historical focus is certainly justified, MCS design in another supply chain phase, namely manufacturing, remains relatively under-explored (Cooper & Slagmulder, 2004; Langfield-Smith & Smith, 2003). Purchased products and services for manufacturing, however, account for more than 60% of the average company's total costs (Degraeve & Roodhooft, 2001) and are subject to numerous joint cost reduction programs with suppliers that also require effective management control (Gietzmann, 1996; Kajüter & Kulmala, 2005; Seal et al., 1999). Therefore, this dissertation specifically studies MCS design for supplier relations in the manufacturing phase of the supply chain. To that end, the dissertation contains three manuscripts, of which each has a specific research objective.

As a general conclusion, we highlight the most important contributions of the empirical findings of these manuscripts to the inter-organizational management control literature. Next, we suggest potential implications for business practice. Finally, we end this section with several suggestions for future research.

1. Contributions to the academic literature

The academic contributions of this dissertation are threefold. First, the dissertation contributes to the literature by *illustrating* MCS design for the relatively under-explored MSRs from both a static and dynamic perspective. More specifically, our case study offers empirical evidence on the importance of informal control (manuscript 1) and the dynamic relation between formal control and trust (manuscript 2). The second contribution concerns

explaining MCS design for MSRs, again both statically and dynamically. Using a contingency theory lens, the dissertation offers insights into variables that affect static cross-sectional MCS design (manuscript 1), MCS dynamics over time (manuscript 2), the speed of these MCS dynamics (manuscript 3) and the association with performance (manuscripts 2 and 3). Third, our dissertation makes some methodological contribution with respect to the object under study, i.e. fluctuating performance (manuscripts 2 and 3), and the model for organizational culture, i.e. the Competing Values Model (manuscript 3). The following paragraphs discuss these contributions in greater detail.

1.1. Illustrating MCS design for MSRs

Manuscript 1 contributes to the academic literature by illustrating MCS design for MSRs and how important informal controls are in that design. Contrary to supplier relations during procurement and R&D, which research found to be governed by a combination of formal and informal controls (Cooper & Slagmulder, 2004; Dekker, 2004; Kamminga & van der Meer-Kooistra, 2007), MSRs are more formal, so that they could be governed by primarily formal controls with little informal controls (Das & Teng, 2001; Bijlsma-Frankema & Costa, 2005). To investigate these management controls of hybrid MSRs, we use transaction cost economics theory (Williamson, 1975, 1979, 1985, 1991, 1993, 1996), supplemented with relational perspectives in order to make up for TCE's negligence of social controls (Dyer & Singh, 1998; Gietzmann, 1996). Consequently, our conceptualization of a MCS includes both formal and informal controls (Langfield-Smith & Smith, 2003).

Findings of an in-depth case study of VCG's MCS design for a cross-section of eight MSRs at one point in time contradict that MSRs are governed by little informal control. Besides formal outcome and behaviour controls, VCG pays considerable attention to informal control, more specifically to different kinds of trust building techniques and social pressure. In that respect, the most striking finding of the first manuscript is the existence and the role of a structured supplier team (STVC) in controlling MSRs. In fact, the STVC functions as a clan which not only structures, and that way strengthens, trust building and social pressure, but also extends this control towards all JIS suppliers. Hence, the case findings of the first manuscript strengthen the external validity of prior case findings on less formal IORs, like R&D collaboration (Cooper & Slagmulder, 2004),

strategic alliances (Dekker, 2004) and joint ventures (Kamminga & van der Meer-Kooistra, 2007).

Manuscript 2 extends this *static* contribution with respect to MCS design by refining the *dynamic* relation between formal control and trust, i.e. the outcome of informal trust building (Anderson & Dekker, 2005; van der Meer-Kooistra & Vosselman, 2006). More specifically, the second manuscript's longitudinal data on VCG's MCS of one particular MSR suggest that formal control and trust are complements and substitutes at the same time, depending on the level of formal control. By distinguishing two categories of formal control based on our findings, it appears that trust and *basic* formal control (i.e. formal control continuously exercised under all circumstances) are complements, while trust and *extra* formal control (i.e. formal control set up on top of basic formal control) are substitutes. 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, the result refines 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. Finally, the 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).

1.2. Explaining MCS design for MSRs

Manuscript 1 further contributes to the literature by explaining MCS design, since evidence on contingency theory's explicative power in MSRs remains limited. With respect to Donaldson's (2001) categorization of contingency theory elements, manuscript 1 concerns the first element, proposing that certain contingencies are associated with MCS design. To investigate this proposition, we suggest a refined theoretical contingency framework for MSRs, set up from the position of the manufacturer and based on recent inter-organizational management control theory. In particular, the theoretical foundations for the included risks and contingencies, which influence MCS design, are transaction cost economics theory and organization theory. The first theory emphasizes the possibility of supplier opportunistic behaviour and provides two contingencies positively associated with

this relational risk, namely environmental uncertainty and relational stability aim (Williamson, 1979). Following prior studies (e.g. Langfield-Smith & Smith, 2003; van der Meer-Kooistra & Vosselman, 2000) using TCE frameworks to conceptualize inter-organizational MCS design, we also incorporate supplier knowledge importance as contingency variable. Second, organization theory supplements TCE's risk of opportunism by identifying the risk of a supply chain interruption and the need to coordinate the MSR and control for this performance risk. Regarding contingencies, organization theory proposes that task uncertainty and task interdependence are positively associated with this risk (Anderson & Dekker, 2005; Cooper & Slagmulder, 2004; Dekker, 2004).

The contribution of the explanatory case study lies in illustrating the validity of the resulting contingency framework in practice by showing substantial evidence of the proposed associations. More specifically, the identification of three supplier types, namely batch, low value-added just-in-sequence and high value-added just-in-sequence suppliers, characterized by different levels of contingencies and risks, visualizes the association with VCG's MCS designed to govern the risks. For example, high value-added just-in-sequence suppliers score relatively high on all contingencies and subsequently on both performance and relational risk. Consequently, VCG designs the MCS accordingly, with high levels of outcome control, behaviour control, trust building and social pressure. That way, our case findings illustrate the framework's explicative power in automotive manufacturing. As our theoretical framework drew on findings concerning MCS design of other less formal IORs (e.g. Cooper & Slagmulder, 2004; Dekker, 2004; Kamminga & van der Meer-Kooistra, 2007), the case not only confirms that MSRs are governed depending on situational characteristics, but also offers more evidence of those findings' external validity. Hence, by studying an under-explored phase of the supply chain, for which the literature proposes different supplier MCS designs, the first manuscript contributes to the literature by reducing a perceived gap between literature and management practice, as called for by Nixon & Burns (2005).

Contrary to manuscript 1's contingency study of cross-sectional MCS design at *one point in time*, manuscript 2 aims at illustrating MCS *dynamics over time* and the association with performance. More specifically, the second manuscript contributes to the literature by refining the dynamics of the fit-performance association, the third and most important element of contingency theory (Donaldson, 2001). This association proposes that a fit between the level of management control and the level of contingencies and risks, as

found in manuscript 1, is positively associated with performance. Although some studies provide theoretical models incorporating this association (e.g. Kajüter & Kulmala, 2005), most research only assumes this association to hold (Kamminga & van der Meer-Kooistra, 2007). As a result, case research is proposed to be a powerful tool to further investigate the fit-performance association, especially by means of a longitudinal design, which allows effectively exploring the impact of fit on performance in the course of time by the sequence of events (Ittner et al., 1999; Dekker, 2004). Therefore, manuscript 2 contributes to the literature by performing an in-depth longitudinal follow-up case study of an exemplary high value-added just-in-sequence VCG supplier relationship that was subject to a considerable change and severe performance difficulties in the course of time.

As proposed (cf Kamminga & van der Meer-Kooistra, 2007; van Veen-Dirks, 2006), case findings show that when the supplier was incapable of dealing with the changed contingencies, a MCS contingency misfit was associated with poor operational performance. That way, this case effectively illustrates the *static* fit-performance association, underlying previous inter-organizational MCS studies like Dekker (2004) and manuscript 1 of this dissertation. Furthermore, the case supports earlier findings of Ittner et al. (1999) and Anderson & Dekker (2005). Nevertheless, the between period comparisons of our longitudinal data refine their findings with respect to the *dynamics* of the fit-performance association. The MCS misfit was only temporal, as VCG adapted the MCS to fit the changed MSR and regain performance. Furthermore, the 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 clarifies the active role of VCG in establishing trust building and social pressure by choosing a suitable supplier plant manager. This choice created a leap of trust in the supplier, which also shows that trust not always has to be built up gradually.

Summarizing these contributions, manuscripts 1 and 2 illustrate the validity of all three elements of Donaldson's (2001) categorization of contingency theory for the under-explored MSRs: (1) the static fit between contingencies and MCS design in manuscript 1, (2) the dynamic fit between contingencies and MCS design in manuscript 2 and (3) the fit-performance association, both statically and dynamically, also in manuscript 2. With reference to the third element, manuscript 2's case study shows the negative *consequence* of a misfitted MCS, namely decreasing performance, and illustrates VCG's attempts to

change the MCS and regain a MCS fit. Following up on these findings, it is worthwhile to investigate variables that *influence* the speed of this MCS change, so that temporary MCS misfits due to changing circumstances are less likely to occur (Kamminga & van der Meer-Kooistra, 2007; van Veen-Dirks, 2006). Since the manufacturer's MCS is the material artefact of its underlying organizational culture (Rousseau, 1990), the degree of supplier cultural resemblance to the manufacturer's culture might be such a variable (Harrison & McKinnon, 1999; Henri, 2006). Therefore, the third manuscript contributes to the literature by illustrating the effect of different degrees of supplier cultural resemblance on the dynamics of MCS design in times of changing circumstances, as called for by Anderson & Dekker (2005), Chenhall (2003) and Scheytt & Soin (2006). To that end, we extended the longitudinal case study of the second manuscript with a similar high value-added just-in-sequence VCG MSR that only differed with respect to supplier cultural resemblance.

Findings show that the functioning of VCG's MCS benefited from a resembling supplier culture, as proposed by Harrison & McKinnon (1999) and Henri (2006). In case of high cultural resemblance, the speed of increasing the level of management control was higher, which supports prior findings of White & Lui (2005). That way, upcoming changes were appropriately anticipated by an increase in the level of management control, already before contingencies actually changed. Yet, the main contribution of the third manuscript regards illustrating *how* high cultural resemblance contributed to VCG's speed of MCS change. As argued by Bierly III & Gallagher (2007), VCG was able to evaluate the resembling supplier earlier by means of three mechanisms that enhance management control according to earlier findings in the literature: proper information exchange (Aquilon, 1997; Luo, 2002), increased communication (Chen et al., 1998; McAllister, 1995) on the initiative of the supplier and trust enhancing signals (van der Meer-Kooistra & Vosselman, 2004).

The previous summary of this dissertation's contributions on explaining MCS design for MSRs demonstrates the *consecutive* character of the three manuscripts, both theoretically and empirically. With respect to *theory*, the second manuscript extends the theoretical framework of manuscript 1 by adding the relation between degree of MCS fit and performance and introducing dynamics in the previously static associations. The third manuscript's framework builds on the dynamic associations of manuscript 2 by introducing a variable that influences the speed of MCS dynamics, namely supplier cultural resemblance. That way, manuscripts 2 and 3 address the role of two variables, namely

performance and organizational culture respectively, which were already put forward in manuscript 1, but remained unaddressed. Regarding *empirics*, manuscript 2's longitudinal case follows up on manuscript 1's cross-sectional case by investigating one of the eight MSRs more in-depth and over time. Also the case of manuscript 3 is a follow-up study. More specifically, this manuscript resumes VCG's MCS design findings of manuscript 1 and then compares longitudinal findings on the VCG-SAG2 relation of manuscript 2 with longitudinal findings on a similar MSR (VCG-SAG1) that differs with respect to cultural resemblance. Consequently, both manuscripts 2 and 3 reiterate certain findings of prior manuscripts, as they are written as stand-alone papers. Yet, these reiterations serve their purpose in answering the research questions of the manuscripts. More specifically, the VCG-SAG case in manuscript 2 is used to illustrate the association between a MCS fit/misfit and performance over time. In manuscript 1, however, the same case relation provides evidence on the MCS design of the specific type of high value-added just-in-sequence MSRs at one point in time. Furthermore, the VCG-SAG case is also studied in manuscript 3 to contrast the effect of low and high cultural resemblance on MCS dynamics. Finally, manuscript 3 only resumes VCG's MCS design findings of manuscript 1 in order to clarify the effect of VCG's culture on the MCS design.

In other words, each manuscript's theoretical framework and case research design suit the manuscript's specific research question. As these research questions are follow-up questions in the context of a larger doctoral dissertation, so are the theoretical frameworks and case studies to study the questions. For an *additional research question* in a follow-up manuscript, we extend the theoretical framework of the previous manuscript with an *additional construct* and gather *additional data*. Based on the analysis of both old and new data, the additional research question is then answered by *additional insights* that converge with the insights of the previous manuscript. For example, the potential influence of organizational culture and cultural resemblance was already put forward in manuscripts 1 and 2, but remained unaddressed until manuscript 3 due to the limited scope of one research paper. By devoting a complete study to these influences, extending the existing theoretical framework and gathering more case data, manuscript 3 provides additional insights on the findings of manuscripts 1 and 2. Consider the additional insights from re-analysing the VCG-SAG2 case findings of manuscript 2 from a different theoretical viewpoint based on the extra theoretical construct of supplier cultural resemblance. The comparison with the additional MSR (VCG-SAG1) definitely led to an important new insight, namely the

identification of three mechanisms affecting the speed of MCS change, which the VCG-SAG2 relation lacked due to a lower degree of supplier cultural resemblance. Yet, also another finding of manuscript 2 was re-interpreted, namely the fact that continuing operational difficulties made VCG influence supplier decision making to install a plant manager of VCG's choice, namely Mr Y. By including the additional perspective of organizational culture in the analysis, manuscript 3 explains how Mr Y initiated a shift in SAG2's culture to a more developmental culture, resembling VCG's culture. That way, the analysis in manuscript 3 shows that the VCG-SAG2 case also demonstrates cultural dynamics, on which further study was called for by Baskerville (2003) and Harrison & McKinnon (1999). Hence, it must be clear that the insights of manuscript 3 add to the insights of manuscript 2 and converge with the findings of manuscript 2 in explaining cause and consequence of MCS dynamics in case of changing contingencies.

1.3. Research methodology

The final main contribution of our dissertation is methodological. First, manuscripts 2 and 3 contribute to the literature by specifically focusing on a changing MSR with fluctuating performance, contrary to the 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 investigating 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 studying 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 on more recent IORs, not requiring full company disguising, are still preferable. Thanks 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 on the VCG-SAG2 relation for the second and third manuscript.

Second, manuscript 3 contributes to the literature by demonstrating the usefulness of applying the Competing Values Model for describing organizational culture in qualitative studies, as proposed by Bhimani (2003). Our findings clearly benefited from conceptualizing organizational culture via the CVM. On the one hand, the model

distinguished the developmental and hierarchical culture types, needed to conceptualize a low degree of cultural resemblance. On the other hand, the CVM allowed conceptualizing a culture shift by means of the notion of dominant types.

2. Implications for business practice

Besides contributing to the academic literature, our findings have some important implications for business practice. First, our case reveals that VCG attaches great importance to MCS design. This finding corresponds to studies emphasizing the *revised* (Gietzmann, 1996) or *extended* make-or-buy decision (van der Meer-Kooistra & Vosselman, 2000; Cooper & Slagmulder, 2004). This type of decision not only deals with the decision to make or buy, but also with supplier selection and MCS design. Our findings indicate that VCG actively considers this extension by designing a comprehensive MCS with formal and informal controls. Hence, provided that VCG is considered a best practice, practitioners might assess the extent to which they implement the extended make-or-buy decision and spend resources on MCS design.

Second, manuscript 2 shows that an appropriate MCS design, fitted on contingencies, benefits performance. Consequently, this dissertation incites practitioners to be aware of the benefits of well designed MCSs in MSRs, especially in a very competitive business environment like automotive. Given that this awareness is present, manuscript 1 provides a practical managerial contribution, namely a tool for some kind of supplier relationship portfolio management. More specifically, the theoretical framework of manuscript 1 might be used to characterize MSR's via the contingency variables and design the MCS accordingly. To that end, VCG's three supplier types (batch, low value-added just-in-sequence and high value-added just-in-sequence) can be interpreted as ideal types on three continuums, depicting the evolution from low to high contingencies, low to high risks and therefore low to high management controls. By positioning the ideal types on these continuums, it becomes clear that a relatively low/high position on the contingency continuum corresponds to a relatively low/high position on the MCS continuum. Such continuum interpretation supports the initial theoretical model, associating contingencies with management controls, and is comparable to recent case based management control findings (e.g. Kamminga & van der Meer-Kooistra, 2007; Sartorius & Kirsten, 2005; van Veen-Dirks; 2006). For example, during van Veen-Dirks' (2006) intra-organizational study of production MCSs, the controller of company B "considered the case study framework a

useful diagnostic instrument for the management control system" (van Veen-Dirks, 2006, p. 94). Similarly, our proposed theoretical framework, supplemented with the three continuums, offers practitioners a management tool to position suppliers and create a supplier portfolio. That way, manufacturer management gets insight into how the MCS of a positioned MSR should be designed to govern the risks following its contingencies. Strengthened by our findings of contingent MCS design (cf Cooper & Slagmulder, 2004; Dekker, 2004; Kamminga & van der Meer-Kooistra, 2007) and the contribution of this contingency fit to performance (cf Anderson & Dekker, 2005; Ittner et al., 1999), we believe this kind of assessment would benefit other OEMs.

Third, VCG's MCS design is a combination of several formal and informal control techniques. That way, our case confirms that informal controls are very important in the 21st century business practice (Nixon & Bruns, 2005), even in manufacturing. Although supplier relations, especially in automotive, seem to become more demanding once the manufacturing phase starts, VCG clearly holds on to cooperative interaction, comparable to the procurement and R&D phase. Instead of lowering collaboration and informal controls in favour of a more demanding approach with more formal controls, VCG balances formal and informal controls and highly values the role of trust building and social pressure. Moreover, the longitudinal analysis of SAG2 in manuscripts 2 and 3 reveals the importance of these informal controls. Only when Mr Y was chosen as new plant manager, the VCG-SAG2 relation regained high trust and lots of social pressure. Without this reinstatement of high informal control, performance would not have picked up; or at least not that quickly. Hence, practitioners should be well aware of the importance of informal controls in MCS design for MSRs.

Fourth, our findings describe a specific means to strengthen this type of control, namely a supplier team (STVC). This STVC functions as a clan, which not only structures, and that way strengthens, VCG trust building and social pressure on individual suppliers, but also extends this control towards all JIS suppliers. The trust building follows STVC activities like networking, frequent information and knowledge sharing, joint decision making and joint problem solving. The social pressure results from the fact that supplier errors are discussed during STVC (workgroup) meetings. Yet, these controls only follow from the STVC's first goal, which is stimulating and facilitating collaboration, in order to continuously improve manufacturing processes. In that respect, the STVC cooperation between VCG and JIS supplier facilities during manufacturing is comparable to the inter-

organizational teams that work together during R&D (Cooper & Slagmulder, 2004). If Western Europe's automotive sector wants to survive the current delocalization to the East and believes in the knowledge economy to help realise that goal, it is important to actively share that knowledge in the manufacturing phase, after the example of successful Japanese OEMs like Toyota and other supply chain phases such as R&D. VCG seems to have understood that importance and has designed its MCS accordingly, with an important role for the STVC. Other OEMs might follow this example.

Fifth, our results warn practitioners about the potential pitfalls of informal control and a related supplier team. On the one hand, the VCG-SAG2 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 practitioners 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, which will lead to time losses. On the other hand, informal control via the supplier team would not work without the willingness of all suppliers to open up their facilities during supplier visits and share both technical and managerial knowledge. This openness among suppliers is not as evident as between the manufacturer and particular suppliers, because some supplier facilities are competitors on mother company level. Obviously, this competition negatively impacts facility managers' willingness or permission to open up factories and share proprietary knowledge. Nevertheless, VCG's STVC overcomes this barrier by arguing that competitiveness only plays during commercial negotiations. During the manufacturing phase, all suppliers serve the same purpose regarding their product, namely supplying the right product, on time, with good quality and at the lowest possible cost. By considering this common goal and allowing suppliers to hold back certain production infrastructure or process knowledge which is patented, the STVC finds most suppliers prepared to collaborate. Thus, OEMs following VCG's example and installing a similar supplier team must consider the extent of supplier competition and develop a clear strategy to handle this problem.

Sixth, manuscript 3 shows that practitioners should be aware of the important influence of supplier cultural resemblance on the speed of MCS change in case of changing contingencies. That way, slower MCS changes can be anticipated and responded to by installing additional controls. To that end, the manufacturer needs to be aware of the own

values, the values on which the suppliers rely and resulting differences. For that purpose, practitioners might use the Competing Values Model, and associated supplier characteristics (i.e. structure, size, ownership and nationality), as a mean to assess supplier culture.

3. Suggestions for future research

Our main suggestions for further research on this dissertation's findings result from the case methodology. Although this method was specifically chosen for its methodological qualities, e.g. with respect to studying MCS dynamics in manuscripts 2 and 3, we acknowledge a singly case study limits (statistically) generalizing our findings towards a larger population of companies. By only looking at one specific industry (i.e. automotive) and exclusively studying one type of IORs (i.e. MSRs) of one OEM (i.e. VCG), we aimed at maximizing comparison opportunities and minimizing extraneous variation within the case. Yet, at the same time, we limited generalizability possibilities outside this context.

Obviously, this generalizability was not the main purpose of our research. Instead, we wanted to "take a particular case and come to know it well, not primarily as to how it is different from others but what it is, what it does" (Stake, 1995, p. 8). With our case study, we emphasized uniqueness, which implies knowledge of others that the case is different from. Still, our first research aim was to understand the case itself (cf Stake, 1995). Ahrens & Chapman (2006) even argue that the question of generalizability and replication in case research is inappropriate, as insights into the objective reality are not available, when made by subjective observers. Valid and reliable case research is based on the trusting conviction that researchers do not lie about the field. Additionally, the research process should be one of "iteratively seeking to generate a plausible fit between problem, theory and data", subject to researcher discipline (Ahrens & Chapman, 2006, p. 836). That way, case studies provide thorough refinement and illustration possibilities of existing theory, which is acknowledged by recent inter-organizational management control literature valuing this type of research (Langfield-Smith & Smith, 2003; Dekker, 2004; Hakansson & Lind, 2004). Moreover, the environment, in which our observations have been made, is presented in the manuscripts, so that an opportunity to rely on the *contextual generalization* rhetoric exists. "In descriptive case studies, this contextual generalization rhetoric provides a way to move from isolated observations to results of a more general status" (Lukka and Kasanen, 1995, p. 85). Nevertheless, the case research design leaves several questions unanswered.

First, it is uncertain whether studying a different automotive OEM would lead to similar findings. With respect to MCS design (cf manuscript 1), it remains unclear to what extent VCG's developmental culture determines the use of informal controls compared to other OEMs. As a result, we wonder whether manufacturers without a supplier team, which provides the opportunity to build personal relations with supplier managers (cf manuscript 1), are also able to choose supplier managers to their advantage (cf manuscripts 2 and 3). To answer these kinds of questions, future research could study another OEM. Despite the value of our case study, we believe that every manuscript in this dissertation might benefit from an additional one in order to create more theory driven variance and divergence in the data (Yin, 2003). After investigating VCG, the purpose of replication in another OEM is identifying whether some of the first findings have replicate nature (Eisenhardt, 1989). For that reason, it is important to have some similarities and some differences between the cases (Leonard-Barton, 1990; Yin, 2003), which makes a second automotive OEM an appropriate choice. The main resemblance would be the production of automobiles, while the most striking difference could lie in the other OEM's culture. As VCG is characterized by a developmental culture, it might be interesting to choose a second OEM with a completely differing hierarchical culture. An interesting research design would then be to study a collective high value-added just-in-sequence supplier, supplying both VCG and the additional OEM, so that differences in MCS design (cf manuscript 1) and/or MCS dynamics (cf manuscript 2 and 3) could be effectively investigated.

Second, we do not know to what extent our findings hold for OEMs in other industries, like consumer electronics, which also manufacture complex functional products and are subject to continuous cost reduction (Fisher, 1997). Hence, further research could investigate how OEMs in such industries design the MCS to control different types of MSRs (cf manuscript 1). Also the roles of personal relations between interacting managers (cf manuscript 2) and supplier cultural resemblance (cf manuscript 3) are worth further study. An additional case study might shed more light on the external validity of our automotive findings in that kind of industries.

Third, we limited our research in the manufacturing phase of the supply chain to supplier relationships. Yet, this under-explored supply chain phase might also entail other types of IORs, like joint ventures, alliances or licensing agreements. In automotive, for example, joint ventures and alliances to jointly develop and manufacture a new type of car or engine are common practice. Consequently, future research might be interested to

investigate how well VCG's MCS on MSRs compares to the MCS on the joint venture or alliance partner during the manufacturing phase of such joint project.

Fourth, our research of supplier relationships was restricted to the manufacturing phase of the supply chain, as this phase remained under-studied compared to prior supply chain phases, like procurement and R&D (Cooper & Slagmulder, 2004; Langfield-Smith & Smith, 2003; Scannell et al., 2000). More specifically, we deliberately abstracted from these phases, to minimize extraneous variation in our research setting of manufacturing. In terms of research methodology, this abstraction was put into operation by studying relationships between a manufacturer facility and supplier facilities that only dealt with manufacturing, while procurement and R&D were handled by their respective mother companies. However, despite the benefits of this abstraction, the impact of procurement and R&D on supplier relationships in the manufacturing phase remains unaddressed. Therefore, future research might relate our findings to findings on supplier relations in prior supply chain phases and investigate the interdependencies between them.

Fifth, further research might investigate whether taking the research perspective of the supplier leads to additional insights, compared to this dissertation's perspective of the manufacturer. Indeed, despite interviewing both VCG and supplier managers in order to increase the data's internal validity, all MSRs and related MCSs were studied through the lens of VCG. Consequently, insights from, for example, a culture assessment from within the supplier, instead of an assessment from the outside, might shed more light on the role of supplier cultural resemblance in MSRs (cf manuscript 3). In that respect, prior research found that buyer and supplier have different perceptions about their relationship (John & Reve, 1982). In case that perception difference also concerns each other's culture, it might influence MCS dynamics.

Besides dealing with previous research questions, future research might also consider choosing a different research methodology. Despite the clear advantages of the case study method for this dissertation's research, we argue that another research avenue lies in testing our findings via a comprehensive large-scale survey. By means of such survey, several OEMs from different industries might be questioned about their MCS on different types of MSRs. That way, the survey's large sample would make up for with this dissertation's low level of generalizability. Yet, while a survey would very well suit testing the research findings of manuscript 1, we believe this research method would be unsuited to test the findings of manuscript 2 and 3, because these manuscripts study MCS dynamics

instead of a cross-section of MCS designs. Obviously, these dynamics are very difficult to conceptualize by means of a structured questionnaire. In addition, we believe that confidentiality issues would limit organizations' willingness to fill in that kind of survey and that way hamper a sufficient response rate. Therefore, we think that additional questions concerning our findings on MCS dynamics can be most adequately studied by means of an accessory longitudinal case study, already suggested before.

In that respect, an extra methodological contribution might be to design the longitudinal case study as a real-time case, instead of a retrospective case like in this dissertation. 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 studies' 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 SAG2 managers, so that their perceptions on the events were not available. A real-time study could cope with these limitations.

In addition to previous future research suggestions, dealing with unanswered questions of our research setting and research design, we provide some specific further research ideas following our second and third manuscript. On the one hand, we have no idea to what extent the findings of these manuscripts hold for other MSRs than the two high value-added just-in-sequence MSRs (SAG1 and SAG2) of these studies. Theoretical suitability made us chose these MSRs, because we expected substantially differing insights due to their extreme divergence on supplier cultural resemblance. Yet, at the same time, these extreme MSRs might not be representative for other MSRs. On the other hand, we do not exactly know to what extent the learning curve impacted the performance of SAG1 and SAG2, when contingencies changed. Before the changes in 2004, SAG1 successfully completed a start-up in 1996 and a new Volvo model introduction in 2000, while SAG2 only successfully completed the start-up in 2000. Also the turnaround of SAG2 performance in 2005, after Mr Y took over, might be influenced by organizational learning. Hence, future research might consider studying MCS dynamics for other MSRs and taking into account the potential influence of organizational learning.

With respect to specific findings of the third manuscript, three potential avenues for further research can be identified. A first avenue could investigate the effect of cultural

differences between other culture types of the CVM. Our study focused on the comparison between hierarchical and developmental culture, following its explicative power in the study of Bhimani (2003). Hence, whether comparisons between other culture types, like group versus rational or group versus developmental, fit our theoretical model and lead to similar results remains unknown. Moreover, this future research stream might benefit from introducing a completely different conceptualization of organizational culture, for example based on the "Organizational Culture for Diversity Inventory" (OCDI) (Whitfield & Landeros, 2006), and investigate whether this conceptualization leads to similar results.

A second research avenue could examine the impact of supplier cultural resemblance on the level of risks. This theoretical association was not included in our theoretical model due to our conceptualization of risk, namely objective risk, inherent in a given MSR and influenced by four supply contingencies (Das & Teng, 2001). This objective risk is not associated with supplier cultural resemblance. Yet, subjective risk, i.e. the manager's estimate of objective risk (Das & Teng, 2001), might be. Because of a lower level of supplier cultural resemblance, the manufacturer might perceive the level of risks higher, given the same level of contingency variables. By way of illustration, consider the VCG-SAG2 relationship in 2004. Assuming that VCG was sufficiently aware of the cultural differences (which in reality was not the case), VCG might have perceived SAG2 as unable to adequately cope with changes imposed by the manufacturer, which would have increased perceived performance risk (McAfee, Glassman & Honeycutt Jr., 2002). In addition, VCG might have perceived SAG2 as unable or unwilling to openly interact and communicate with VCG, which would have augmented perceived relational risk (Luo, 2002). It must be clear that the research design of manuscript 3 was unsuited to investigate the association of supplier cultural resemblance and perceived risks, as we examined events as objectively as possible after they occurred. Our focus lied on inherent risks only, in order to gain an understanding of the existence of these risks in the absence of any management controls (cf Anderson, Christ & Sedatole, 2006). Nevertheless, the association between supplier cultural resemblance and subjective risks is worth studying.

A third and final avenue for further research on manuscript 3 might examine other potential MCS influencing variables besides supplier cultural resemblance. Two of those variables might be relationship length and fair benefit sharing, already proposed to be influential by Dekker (2004), Gietzmann (1996), Tomkins (2001) and van der Meer-Kooistra & Vosselman (2000).

For every manufacturer, supplier relationships form an important component of the competitive advantage. However, these MSRs require an appropriate MCS design to realise the benefits aspired. This dissertation provides insights into this MCS design and illustrates its effect on performance over time for one automotive OEM. The research findings largely contribute to the academic literature and offer several implications for business practitioners, summed up in this concluding section of the dissertation. Nevertheless, this conclusion also makes clear that MCS design of MSRs still presents many interesting research opportunities. We hope that these suggestions inspire future researchers to take up the challenge of designing new empirical research that addresses some of the many relevant research questions at hand.

List of tables

Table 0.1 Interview data summary 24
Table 1.1 Interview data summary 41
Table 1.2 Exemplary interview quotes concerning VCG's MSR contingencies and risks .. 50
Table 1.3 Exemplary interview quotes concerning VCG's formal management controls ... 55
Table 1.4 Exemplary interview quotes concerning VCG's informal management controls 63
Table 2.1 Interview data summary 87
Table 3.1 Interview data summary 135
Table 3.2 Exemplary interview quotes concerning contingencies associated with supplier culture 139

List of figures

Figure 0.1 Generic theoretical framework 10
Figure 1.1 Theoretical contingency framework for MCS design of MSRs 32
Figure 1.2 MCS design of MSRs at VCG 45
Figure 2.1 Theoretical contingency framework for MCS design and the impact on operational performance of MSRs 81
Figure 2.2 VCG-SAG MCS fit and operational performance over time 102
Figure 3.1 Theoretical contingency framework for MCS design of MSRs 125
Figure 3.2 High cultural resemblance VCG-SAG1 MCS fit and performance consequences over time 148
Figure 3.3 Low cultural resemblance VCG-SAG2 MCS fit and performance consequences over time 149

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