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ORIGINAL ARTICLE

Managing Interdependence in Multi-business Organizations

A Case Study of Management Control Systems

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Abstract Managing interdependence in multi-business organizations is a profound challenge for the design and use of management control systems. Results of a case study of a leading multinational telecommunications provider suggest that the composition of control systems varies significantly with the type of interdependence. This is further substantiated by six qualitative sub-cases of the case study firm. Specifically, we find that management control systems are significantly more complex in cases of cooperative forms of interdependence than in cases of transactional forms. Contrary to expectations, this also applies to pooled interdependence which occurs when separate units share some common resources.

Keywords Behavioral accounting · Control mechanisms · Corporate parenting · MNC · Shared services

JEL Classifications G34 · L21 · L22 · L25 · M16 · M41

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1 Introduction

Multi-business ("M-form") organizations comprise separate business units which are coordinated and controlled by corporate executives (e. g., Chandler 1991; Galbraith 1973; Galunic and Eisenhardt 2001). However, structuring a firm into business units that could also be run as independent companies makes it difficult to create value through firm-wide economies of scale and scope (e. g., Chandler 1990; Goold and Campbell 2002; Goold et al. 1994; Goold and Pettifer 2001). To realize a "parenting advantage," corporate managers strive to encourage cross-unit collaboration by intervening in strategic planning and budgeting, facilitating cross-unit projects, providing central functions and shared services, or implementing centralized portfolio management (Martin and Eisenhardt 2010). In turn, as levels of collaboration between business units increase, resources and activities within a multi-business organization become more interdependent. Managing this interdependence is a profound challenge to the design and use of management control systems in multi-business organizations.

Previous research has spent considerable attention to the management of interdependence through management control. Many of these works consider interdependence in inter-organizational relations such as international joint ventures (Kumar and Seth 1998) and buyer-supplier arrangements (Dekker 2004). With the exception of the more specific case of control relationships between domestic headquarters and interdependent subsidiaries of multi-national corporations (MNCs) (Ambos and Schlegelmilch 2007; Bushman et al. 1995; Gencturk and Aulakh 1995; Martinez and Jarillo 1991; Mascarenhas 1984; O'Donnell 2000), there is few research on how intra-firm interdependence affects the design and use of management control systems in multi-business organizations (Abernethy et al. 2004; Chenhall and Morris 1986; Gupta and Govindarajan 1986; Keating 1997; Macintosh and Daft 1987). This study addresses this gap by providing a case study on the configuration of management control systems of a multi-business firm. Scholars in the field of management control have recently called for more research on how control mechanisms combine effectively into management control systems (Caglio and Ditillo 2008; Cardinal et al. 2010; Ferreira and Otley 2009; Malmi and Brown 2008). We respond to these calls by examining what configurations of management control systems are required to manage different types of interdependence between business units.

For this purpose, we conduct an in-depth study of management control in a leading multinational telecommunications corporation with a multi-business structure. The case firm responded to increasing market saturation and product convergence in the telecommunications and internet markets with increased attempts to develop integrated product solutions and to reduce costs. This strategic shift had also implications for the corporate parenting style, i. e. the pattern how corporate managers structure and influence their businesses in order to create added value (Goold et al. 1994). The case study firm turned from the parenting style of financial controlling with low interventions into business-level strategies by the corporate parent to strategic controlling and planning with moderate to high interventions. This resulted in higher levels of collaboration between subunits and, hence, in increased interdependence of resources and activities within the firm. However, management

control progressively faced its limits because the corporate management predominantly promoted internal competition by implementing market-driven mechanisms. By driving the subunits as profit centers and controlling their EBITDA (i.e., earnings before interest, taxes, depreciation and amortization) results, cross-unit collaboration was diminished. This prompted corporate executives to launch a project to develop management control systems with a broader range of controls. While accompanying this project, we found that the top management's design choices to configure management control systems are significantly related to the type of interdependence that occurred in cross-unit relationships.

Our study contributes to extant research in several ways. First, it advances research on management control of interdependence. Among other types of interdependence, we reflect on the less well-researched form of intensive interdependence, which is of growing importance for corporate managers who strive for synergies in an increasingly knowledge-driven economy. Second, we engage the literatures on management control and corporate parenting in more exchange than hitherto (Martinez and Jarillo 1991; Nilsson 2000). Connecting the literatures on management control and organization design, on the one hand, with research from scholars in the fields of strategic management and international business, on the other, is also of broader programmatic relevance to business research. Third, our empirical study provides in-depth case material on the composition of, and interactions between, control mechanisms in a large MNC and thus contributes to a further empirical substantiation of existing research.

Our paper is organized as follows: In Sect. 2, we review prior research on management control of cross-unit interdependence and outline the conceptual framework of our study. For this purpose, we define typologies of interdependence and control mechanisms. In the third section we briefly introduce data and methods of our case study of a leading multinational telecommunications provider. Our findings are summarized in the fourth section. We present and elaborate on the findings in six qualitative sub-cases of financial accounting, customer service, sales channels, fleet management, product and innovation management as well as marketing campaigns of the case study firm. The presentation of the results is followed by a concluding discussion with suggestions for future research.

2 Literature Review and Conceptual Framework

Firms define business units in order to disentangle resources and activities and to reduce coordination requirements across divisional boundaries (Milgrom and Roberts 1992). However, many interdependencies still remain even if the multi-business form has been implemented (van der Meer-Kooistra and Scapens 2008). This applies all the more to multi-business firms whose corporate parent strives to create firm value by realizing economies of scale and scope through cross-unit collaborations (Goold and Campbell 2002; Goold et al. 1994; Goold and Pettifer 2001). Managing interdependence creates, in turn, severe challenges for the design and use of management control systems. To address this issue, we develop the basis for our case study in three steps: first, we revisit empirical results of the link between the

occurrence of interdependence and the use of control mechanisms. Second, we deduce a typology of interdependence from previous literature in organization theory. Finally, we introduce four generic mechanisms that may combine into management control systems of multi-business firms.

2.1 Management Control of Interdependence

Scholars of management control and organization theory have devoted some attention to the link between interdependence and control mechanisms. Ever since the seminal work of Thompson (1967), empirical results of contingency research on management control systems suggest that the use of control mechanisms depends on the level or type of interdependence among business units. We summarize this research in Table 1. Our review, thus, focuses on empirical works that explicitly refer to cross-unit interdependence and management control mechanisms in multi-business firms.[1]

As has been criticized more generally in the literature on management control (Cardinal et al. 2010; Malmi and Brown 2008), the studies included in Table 1 vary considerably in the definition as well as in the operationalization of control mechanisms. Contrary to this terminological and operational heterogeneity, there is little theoretical variety in interdependence research. Departing from the work of Thompson (1967) and others (Lawrence and Lorsch 1967; Ouchi and Maguire 1975), contingency theory is still the most frequently applied theoretical approach, with only few exceptions of agency theory (Abernethy et al. 2004; Bushman et al. 1995; O'Donnell 2000). These major theoretical streams are associated with largely quantitative methods.

At the most general level, the results of previous research seem to suggest that the use of control mechanisms and the complexity of control systems is an increasing function of interdependence among business units (Ambos and Schlegelmilch 2007; Chenhall and Morris 1986; Gencturk and Aulakh 1995; Martinez and Jarillo 1991; Mascarenhas 1984; O'Donnell 2000). These findings confirm the assumption of contingency theory that coordination demands increase in relation to the level of interdependence. This is due to the fact that it is difficult to evaluate the unique contributions of business units to the overall firm performance when resources and activities mutually affect each other (Blazevic and Lievens 2004). This is consistent with the literature on how interdependence is related to controllability, suggesting that the more interdependent business units are, the less accountable unit managers can be held for results (Choudhury 1986; Giraud et al. 2008). Corporate managers seem to respond to these requirements by designing and using more sophisticated control systems.

[1] In order to ensure topicality and relevance, our overview excludes works that have been published prior to 1980 (Hall et al. 1977; Hickson et al. 1969; Ouchi and Maguire 1975; Van de Ven et al. 1976). In addition, we do not consider studies on interdependence between organizations, e. g., within joint ventures (Kumar and Seth 1998), strategic alliances (Luo 2008) or supply chains (Dekker 2004), because these settings differ too much from cross-unit collaborations within firms.

Table 1 Summary of Empirical Studies on Management Control of Divisional Interdependence

Paper	Focus	Theory	Sample	Method	Results
Abernethy et al. 2004	Impact of interdependence level on the use of divisional summary measures	Agency theory	78 divisions of firms listed on Amsterdam Stock Exchange	Simultaneous equation model	With an increasing level of interdependencies, performance measures shift from the divisional to the firm level
Adler 1995	Change of control requirements of interdependence over the course of the product development project's life cycle	Contingency theory	Development projects in 9 printed circuit board operations and 4 aircraft hydraulic tubing operations	Multiple case study	Increasing novelty of fit issues between product and process parameters requires use of more interactive control mechanisms Decreasing analyzability of fit issues requires more control effort in later phases of the life-cycle
Ambos and Schlegelmilch 2007	Impact of interdependence level on the use of centralization, formalization and socialization	Organizational power, contingency theory	134 overseas research and development (R&D) units of 49 German top 500 firms	Multiple regression analysis	With an increasing level of interdependence, the use of centralization, formalization, and socialization increases
Bushman et al. 1995	Impact of interdependence level on the use of aggregate and business unit level performance measures	Agency theory	246 US *Fortune 500* firms	Multiple regression analysis	With an increasing level of interdependence, the use of aggregate performance measures increases and the use of business unit level performance measures decreases
Chenhall and Morris 1986	Impact of interdependence type on the perceived usefulness of information characteristics of management accounting systems	Contingency theory	36 Australian manufacturing firms	Multiple regression analysis	In case of sequential and reciprocal interdependencies, managers perceive a broad scope and a high integration of management accounting systems as more useful than in case of pooled interdependencies

Table 1 Summary of Empirical Studies on Management Control of Divisional Interdependence (Continued)

Paper	Focus	Theory	Sample	Method	Results
Genctürk and Aulakh 1995	Impact of interdependence level on the use of output and process control	Contingency theory	78 strategic business units (SBUs) of 42 US-based MNCs	Multiple and hierarchical regression analysis	With an increasing level of interdependence, the use of process control increases
Gupta and Govindarajan 1986	Impact of interdependence level on the performance effects of subjective and formula-based approaches for determining bonuses	Contingency theory	58 SBUs of 8 *Fortune 500* firms	Multiple regression analysis	With an increasing level of resource sharing, subjective approaches for determining a general manager's bonus make a greater contribution to an SBU's effectiveness than formula-based approaches
Gupta and Govindarajan 1994	Impact of interdependence level on lateral integration, communication, socialization, decentralization, and size of bonus relative to salary	Contingency theory	359 subsidiaries of MNCs headquartered in the US, Japan, and Europe	Analysis of variance	At high levels of knowledge inflow and outflow, the use of formal lateral integrating mechanisms and the intensity of communication are high, while the size of bonus relative to salary is low At low levels of knowledge inflow and outflow, the use of formal lateral integrating mechanisms and the intensity of communication are low, while the size of bonus relative to salary is high
Keating 1997	Impact of interdependence level on the use of division accounting metrics, firm accounting metrics and firm stock price	Organizational economics	78 firms and divisions	Multiple regression analysis	With an increasing impact of responding managers on other divisions, the use of firm accounting metrics increases With an increasing impact of other managers on respondents' divisions, the use of firm accounting metrics decreases

Table 1 Summary of Empirical Studies on Management Control of Divisional Interdependence (Continued)

Paper	Focus	Theory	Sample	Method	Results
Macintosh and Daft 1987	Impact of interdependence type on the use of formal controls	Contingency theory	90 divisions of 20 North American firms	Correlation analysis	With an increasing extent of pooled interdependence, the use of standard operating procedures increases, while the use of budgets and statistical reports decreases With an increasing extent of sequential interdependence, the use of budgets and statistical reports increases With an increasing extent of reciprocal interdependence, the use of standard operating procedures and budgets decreases
Martinez and Jarillo 1991	Impact of interdependence level on the use of formal and informal controls	Contingency theory	50 subsidiaries of foreign MNCs in Spain	Principle component analysis	At high levels of integration and low levels of localization, the use of formal and informal controls is high At low levels of integration and high levels of localization, the use of formal and informal controls is low
Mascarenhas 1984	Impact of interdependence level on the use of coordination methods	Contingency theory	25 subsidiaries of 25 foreign MNCs the USA	Correlation analysis	With an increasing level of interdependence, the use of system-sensitive members and personal communication increases
O'Donnell 2000	Impact of interdependence level on the use of vertical integrating mechanisms, lateral integrating mechanisms, career rewards and subsidiary rewards	Agency theory, contingency theory	255 headquarters-foreign subsidiary pairs of U.S. MNCs	Multiple regression analysis	With an increasing level of headquarters-subsidiary interdependence, the use of vertical integrating mechanisms, career rewards and subsidiary rewards increases With an increasing level of inter-subsidiary interdependence, the use of lateral integrating mechanisms and career rewards increases

However, this general result is neither entirely consistent, nor is it readily comparable as the applied concepts and empirical settings vary considerably. Some authors provide evidence that, at high levels of interdependence, the increased use of some mechanisms is compensated by the decreased use of other controls (Gupta and Govindarajan 1986, 1994; Macintosh and Daft 1987). Further studies show that control mechanisms may only shift, in line with the controllability principle, from the localized unit-level to the aggregated firm-level as interdependence among business units increases (Abernethy et al. 2004; Bushman et al. 1995). This suggests exploring control mechanisms integratively rather than separately, so that it can be examined how the configuration of management control systems may change with different levels and types of interdependence.

2.2 Interdependence Between Business Units

Interdependence is defined as the extent to which decision-making entities are dependent on each other due to exchange or sharing of resources and activities to accomplish tasks (Grandori 2001; McCann and Galbraith 1981; Thompson 1967; Van de Ven et al. 1976; Van de Ven and Ferry 1980). The most well-known typology of interdependence was introduced by Thompson (1967; for a critique see Victor and Blackburn 1987), who identified three forms of interdependence – *pooled, sequential* and *reciprocal* interdependence – that place increasing demands on coordination as they contain increasing degrees of contingency:

- *Pooled interdependence* occurs when units share homogeneous resources and activities but remain otherwise autonomous. In this case, business units use a common pool of resources and activities but still follow their own objectives. Pooling similar resources and activities is predominantly driven by economies of scale.
- *Sequential interdependence* involves unidirectional flows of resources and activities from one unit to the other. In this case, the business units accomplish their tasks in a value chain where downstream steps are highly dependent on upstream steps. The output of a preceding unit is the input to a succeeding unit, but not the other way around.
- *Reciprocal interdependence* emerges from bidirectional flows of resources and activities between units. If business units are reciprocally interdependent, they mutually exchange resources and activities while simultaneously performing a task. Inputs and outputs feed back and forth between the business units.

Some previous works on management control have readily applied this three-part typology to interdependence in order to predict the choice of control mechanisms (Baliga and Jaeger 1984; Macintosh and Daft 1987; Martinez and Jarillo 1991). Thompson, however, (1974a; 1974b) acknowledged in his later works that there is a fourth type of interdependence, which he called “intensive interdependence” (see also Hickson et al. 1969, p. 380–81; Thompson 1967, p. 17–18; Thompson and Bates 1957, p. 341; Van de Ven et al. 1976, p. 324–26):

- *Intensive interdependence* exists when units combine heterogeneous resources and activities and engage in direct collaboration. If business units are intensively interdependent, they create new bundles of complementary resources and activities in order to pursue overall goals. These joint efforts are primarily directed toward economies of scope.

Among others (Van de Ven and Ferry 1980), Grandori (2001) has elaborated on Thompson's four types of interdependence and, moreover, classified them into transactional and cooperative interdependence, depending as to whether resources and activities are either exchanged or shared (see also Pfeffer and Salancik 1978). *Transactional interdependence* is said to occur when the exchange between business units includes a transfer of resources and activities. This requires a certain degree of decoupling of resources and activities as well as a clear interface between the business units at which one stage of the process terminates and another begins (Williamson 1981). Sequential and reciprocal interdependence are transactional forms of interdependence.

On the contrary, *cooperative forms of interdependence* emerge from the shared use or creation, rather than from the transfer, of resources and activities. Managing cooperative interdependence effectively is particularly important for multi-business firms as organizations are superior to markets when it comes to transforming resources and activities (Simon 1991). Thus, cross-unit collaboration promises a parenting advantage for multi-business firms because, otherwise, the business units could be run as independent companies transferring resources and activities on markets (Goold and Campbell 2002; Goold et al. 1994; Goold and Pettifer 2001). Cooperative interdependence either results from the aggregation and sharing of common resources and activities or from combining resources and activities into new bundles. Accordingly, pooled and intensive interdependence fall into the category of cooperative forms of interdependence. In the case of pooled interdependence, the involved units cooperate indirectly because they use the same pool of resources and activities. This makes them to some extent dependent on each other even at the absence of direct cooperation.

All these types of interdependence may result in severe control problems, yet in different ways and to different degrees, having to do with high demands on effective coordination and consistent decision-making (Grandori 1997; Jaworski et al. 1993; Simon 1991). It is, thus, essential for multi-business firms to appropriately design management control systems so that cross-unit collaboration is encouraged and unit managers avoid moral hazard and are prevented from free-riding (Hill et al. 1992; Martin and Eisenhardt 2010; Williamson 1975). Corporate managers are provided with a portfolio of control mechanisms for this purpose.

2.3 Control Mechanisms

Various definitions of management control can be found in the literature and many attempts have been made to determine the range of its mechanisms (for reviews, see Caglio and Ditillo 2008; Chenhall 2003; Malmi and Brown 2008; Merchant and

Otley 2007). This research has emerged from related streams of research in management control (e. g., Anthony 1965; Merchant and Van der Stede 2011; Simons 1990) and organization theory (e. g., Eisenhardt 1985; Ouchi 1979, 1980). Most fundamentally, both lines of inquiry share an understanding of management control as linking individual behaviors to organizational goals. Anthony, for instance, defines management control as "the process by which managers influence other members of the organization to implement the organization's strategies" (Anthony 1988, p. 10; Anthony and Govindarajan 2008, p. 6). The managers' influence is exerted by the use of control mechanisms which, when combined, are the elements of management control systems (Merchant and Van der Stede 2011, p. 15).

The conceptual framework of our study includes four generic mechanisms of control – *input, process, social* and *output* – which can be derived from extant literature in management control and organization theory (for similar typologies, see Anthony 1965; Merchant and Van der Stede 2011; Ouchi 1979; 1980; Simons 1990). These mechanisms are broad archetypes, representing the elementary forms of management control. They are applied at different stages of the transformation process and thus indicate the timing of intervention.

- *Input control* is directed toward the preconditions of performance and, therefore, is an ex ante form of control. Managers exert input control when they provide organizational units or employees with resources that are necessary to perform according to organizational goals (e. g., Dugdale and Lyne 2006; Flamholtz 1996). Input control "focuses on human, material and financial resources flowing into the firm" (Cardinal et al. 2004, p. 414) and, thus, serves to create preconditions for the transformation process. For example, the repertoire of input control includes planning of budgets and assignment of employees.
- *Process control* is intended to ensure that organizational members or units perform activities in a specific way. This requires the controller to have high transformational knowledge and to be able to define how procedures and behaviors should be performed (Ouchi 1979). Process control, thus, sets the guidelines and rules for the performance process, which are enforced by hierarchical authority (Barnard 1938; Lawrence and Lorsch 1967; March and Simon 1958). Examples of such instruments are standard operating procedures and behavioral monitoring.
- *Social control* facilitates mutual persuasion and monitoring among employees, thus largely corresponding to "peer control" or "clan control" (Adler 2001; Gupta and Govindarajan 1986; Kirsch 1996; Ouchi 1979). It involves the delegation of decision-making power to subordinates, mainly firm members who usually do not have hierarchical authority over one another (Loughry 2010). Social control facilitates interaction between these members because it deliberately provides formats for personal exchange on a regular or ad hoc basis. Among such instruments are, for instance, quality boards and communities of practice.
- *Output control* is directed toward the final results of the performance process and is, thus, an ex post form of control. If output control is applied, organizational units or employees are held accountable for the achievement of performance goals. This requires the controller to observe and measure outcomes while limited knowledge is only necessary with regard to the performance process itself (Ouchi

1979). Output control, for example, is exerted through the use of key performance indicators (KPIs) within or across business units.

Mechanisms of input, process, social and output control do not operate separately, but combine into management control systems (e. g., Abernethy and Brownell 1997; Abernethy and Chua 1996; Dent 1990; Fisher 1998; Otley 1980; Peterson 1984). The executive's task is therefore to purposefully orchestrate controls, rather than choose one over the others. In spite of this, research on the simultaneous use of multiple controls that may mutually affect each other is still at its beginnings (e. g., Alvesson and Kärreman 2004; Caglio and Ditillo 2008; Ferreira and Otley 2009; Grandori and Soda 2006; Kennedy and Widener 2008; Malmi and Brown 2008; Sandelin 2008). Our case study examines how the configuration of management control systems is conditional on the types of interdependence among subunits of a multi-business organization.

3 Data and Methods of the Case Study

3.1 Case Setting

The subject of our case study is a multi-business firm that provides its customers with a broad range of products and services in the areas of telecommunication and information technology (Bagban 2010). The firm, with more than 230,000 employees and over EUR 70 billion in sales, is one of the leading European telecommunications providers and operates via its subsidiaries in more than 20 countries on nearly all continents. It demanded a realignment of the firm's strategy because of increasing market saturation and product convergence in the telecommunications and internet markets at the beginning of the 21st century: on the one hand, capital market pressures increased the necessity to reduce costs in the provision of internal services; on the other hand, the increase in integrated product solutions required closer cooperation between the firm's divisions. Therefore, the corporate parent changed track, from the parenting style of financial controlling to strategic controlling and planning. Accordingly, attention was shifted to collaborative relationships in which resources and activities were shared, transferred, or developed. In the course of the research project, we documented and evaluated 325 collaborations between 29 subunits (profit centers) in three operational segments.

To meet the new requirements imposed on corporate parenting, the organizational structures were adjusted and the existing control systems were reconfigured: in addition to market mechanisms and results controls, numerous other instruments were introduced, all aiming at managing collaboration between subunits (e. g., process stipulations, models of decision-making panels, interlocking personnel). However, corporate executives neglected the "fits" and "misfits" between the various control mechanisms within the expanding control systems. As a result of this uncoordinated proliferation, an increase in management impact, which they hoped to achieve through a broader use of management controls, could not be realized. In response to this situation, the corporate board commissioned a project to develop more inte-

grated management control systems. This large-scale undertaking was implemented in all subunits; it involved more than 150 internal and external project staff and took more than two years. The goal of the project was to disentangle the existing management control systems to derive findings about how to effectively (re-)combine controls.

3.2 Data Sampling

The data were elicited through (1) semi-structured expert interviews within the firm, (2) the evaluation of internal and external secondary information, and (3) consultations with other industry experts. The interview partners were selected iteratively and cumulatively, in keeping with the snowball principle (Corbin and Strauss 2008; Miles and Huberman 2009). A total of 59 interviews were conducted with 15 senior managers, 24 divisional and unit heads, 12 technologists and project staff members, and 8 external consultants over 14 months (for the interview guideline, see Appendix A). The interviews were held in German and took on average 90 minutes. They were recorded and fully transcribed, yielding a text corpus of more than 800 pages. All excerpts quoted in Sect. 4 were translated into English by a bilingual native speaker. The interviews were complemented and validated by document analyses and further consultations with experts. Examples of the documents that were analyzed are: organizational charts, project documentations such as reports and presentations by strategy consultants and task forces, and method guidelines such as process manuals and flowcharts. External documents (mostly in German, some in English) contained publicly accessible information such as annual reports, status reports, balance sheets, firm presentations, websites as well as press clippings and other media items. After completing the analysis, we validated its findings by discussing them with other employees of the case firm and with industry experts.

3.3 Data Coding

The material gathered from interviews was coded by means of qualitative content analysis (Corbin and Strauss 2008). A deductive coding approach was applied and the elements of the conceptual framework (i. e., types of interdependence and mechanisms of control) served as basic categories by means of which we recorded the various cross-unit collaborations in the case study firm. Deductive coding has particular advantages because it is highly systematic and governed by rules. Having defined coding rules and prime examples for each category (see Appendices B and C), we analyzed the interviews by using the software ATLAS.ti. In order to arrive at consistent interpretations, the coding was conducted by two of the authors, who read the interviews independently as well as collaboratively and discussed possible inconsistencies or contradictions. If the coders disagreed on an interview and could not resolve it, the problematic excerpt was excluded from further analysis. This process helped to ensure that the data were interpreted in consistent ways and that no essential information was omitted.

Table 2 Sub-cases

Herme-neutic unit	Sub-case	Interdepen-dence	Applied control mechanisms			
			Input	Process	Social	Output
HU1	Financial Accounting	Sequential	○	◑	○	◑
HU2	Customer Service	Reciprocal	●	○	◑	◑
HU3	Sales Channels	Pooled	◕	◕	◕	◔
HU4	Fleet Management	Pooled	◔	●	◑	◑
HU5	Product & Innovation Management	Intensive	◑	●	●	●
HU6	Marketing Campaigns	Intensive	◑	◑	●	●

Emphasis on control mechanisms: circle = low; full circle = high.

3.4 Data Analysis

We conducted qualitative (sub-)case studies of the configurations of management control systems, taking into account each type of interdependence. These qualitative analyses aimed at illustrating why corporate managers combine control mechanisms in particular ways and how they take control requirements for different types of interdependence into consideration when it comes to design choices. Our rationale for selecting these sub-cases was to find cases that are typical with regard to both the types of interdependence and the corresponding composition of management control systems. These requirements were met by the case study firm's subunits such as financial accounting (sequential interdependence), the customer service (reciprocal interdependence), the sales channels and fleet management (pooled interdependence), product and innovation management as well as marketing campaigns (intensive interdependence). The interview quotations included in the presentation of the six sub-cases were selected during a second run of the qualitative content analysis (Corbin and Strauss 2008).

4 Results: Management Control Systems Across Subunits

Table 2 provides an overview of the sub-case studies which will be presented in the following. We selected one sub-case for each of the transactional types of interdependence (i. e., sequential and reciprocal) and two sub-cases for each of the cooperative forms (i. e., pooled and intensive). We spend more attention to cooperative interdependence because these forms, as outlined above, are of particular importance for the exploitation of parenting advantages in multi-business firms.

4.1 Management Control of Sequential Interdependence: Financial Accounting

An example of sequential interdependence is financial accounting within the case study firm. In the course of the strategic realignment, the mass data processing for accounting services was separated from the subunits and assigned to the Corporate

Financial Accounting Services (C-FAS) at the corporate level. In turn, C-FAS collaborates with the business units when it comes to financial recording and reporting of business transactions for accounting purposes. Within this process, data from business transactions are transferred from the operational units to C-FAS which is responsible for entering accounting data into the central IT systems. C-FAS then transmits all processed data to the peripheral accounting units which reuse this information for preparing annual financial statements. Centralizing tasks allows the corporate parent to focus on optimizing process costs and the quality of mass accounting by standardizing procedures.

The sequential workflow from the operational units via C-FAS to the decentralized accounting units is controlled by a combination of rules and procedures (i. e., process control) with key performance indicators (i. e., output control). The procedural guidelines are defined by the corporate center. There are also Service Level Agreements (SLAs) between C-FAS and the business units. Furthermore, the corporate center uses the average process costs of mass accounting as a performance measure that also forms the basis for performance-based payments of C-FAS members. What is more, further key performance indicators are elevated and reported to both the corporate center and the business units on a weekly basis. This combination of process and output control limits the actors' scope of action and guarantees compliance with the procedures: *"It is important that everyone conforms with the process standard; everyone in the firm stands to benefit from that"* (HU1/P4/38–39). At the same time, however, the exclusion of social control from the management control systems contributes to the fact that there is little interaction between members of the involved units. In order to avoid potential deviations from procedures, the corporate center makes a coercive rather than interactive use of process control (Adler and Borys 1996). This means that subordinates do not have the option to influence procedural rules: *"We're not open for dialogue, [...] we take a hard line, and say: 'Here's the process, and it's your job to stick to it!' That's the sort of thing that is implemented across the firm from the top, via the managing board"* (HU1/P4/54–55; 163–68).

The financial accounting of the case study firm is an example of how clearly definable and separable resources and activities flow from one unit to the other but not the other way around. This type of interdependence is rather simple and, thus, places low demands on the design of management control systems. In order to ensure a smooth workflow, corporate managers control outputs of upstream units which subsequently become inputs of downstream units. In addition to ex post controls, process controls help to prevent errors because they specify, in advance, the requirements of the involved units and reduce the degree of freedom. Since the transformation process involves rather simple executing tasks, it is easy to achieve symmetry in cause-effect knowledge between the controllers and the involved subunits, which makes process control a feasible instrument. On the contrary, applying more interaction-based mechanisms such as social and input control would conflict with the efforts to increase reliability and efficiency by standardization. The management control systems are, thus, largely reduced to dyads of output and process control.

4.2 Management Control of Reciprocal Interdependence: Customer Service

A sub-case of reciprocal interdependence among subunits is the customer service of the case study firm. If a customer's problem cannot be solved via the internet portal, the hotline or sales points, there are two profit centers which collaborate over finding a solution: Customer Technical Service (CTS) and Network Infrastructure Operations (NIO). At first, the hotline or one of the sales points sequentially forwards the order to CTS. If members of the technical services recognize a physical cause of damage in the network infrastructure (e. g., cable or antenna damage), NIO is included into the process. Members of NIO take charge of the service order as well as the information which has been available up to this point. As soon as the employees have repaired the damage, the service order is returned to CTS which concludes the technical work and, finally, informs the customer of having solved the problem. Owing to this mutual exchange between CTS and NIO, shortcomings and errors in one unit would lead to problems and additional effort in the other unit.

Corporate managers cope with reciprocal interdependence between CTS and NIO by designing a management control system that relies most strongly on input control, complemented by social and output control, but largely excludes process control. Input control, exerted by the allocation of experts who manage the interface between CTS and NIO (i. e., personal assignment), is suitable to encourage flexible answers to non-routine problems. This is the only kind of problem which becomes subject to the collaboration between CTS and NIO because customer issues with higher levels of standardization are resolved by other subunits at earlier stages of the customer service process. In the process of collaboratively solving remaining problems, interlocking personnel plays a crucial role: *"There is an Intraday Performance Manager who controls these interfaces. And whenever there is some problem or other – job quality, for instance, requirements imposed on the hotline or something like that – we sort it out directly and bilaterally. There is such a manager in both companies, and they confer directly with one another"* (HU2/P2/149–54). The interactions of the Intraday Performance Managers enhance their cognitive proximity: *"Then they immediately understand and try to put themselves in the position of other people"* (HU2/P15/445–46). On the basis of a mutual understanding and acceptance of the involved parties, customer issues can be resolved swiftly and consequential errors can be prevented.

In contrast to input control, process control does not prove to be suitable for those problems that are collaboratively resolved by CTS und NIO. The particular challenge of the control of reciprocal interdependence does not arise from the bidirectionality of the relationship per se (in contrast to the uni-directional transfer in the case of sequential interdependence), but from the need to solve complex problems in an unpredictable relationship (Grandori 2001, p. 243; Puranam et al. 2012). For example, finding the causes of unexpected breakdowns in telecommunication networks is a difficult task and requires intense communication between customer services and network operations. Reciprocal interdependence is thus characterized by low task programmability, and under such conditions, it would be prohibitively expensive to define rules and procedures. For this reason, unit managers explicitly reject process control imposed by the corporate parent: *"They may introduce*

Service Level Agreements at some point – hopefully not, because things are running very, very well at the moment. Stumbling blocks and conflicts of interests are removed quickly, without the need for Service Level Agreements" (HU2/P20/669–72). While they follow some operational agreements that define the interface between CTS and NIO at a general level, corporate managers are not involved in either the development or the monitoring of these agreements because they do not have the necessary expertise and information: *"Hitherto, we have not been so painstakingly attentive to minutiae in operational terms. […] It is also a question of expertise. Our background is in cost accounting and thus we have always moved on a certain specialized level"* (HU2/P7/305–12). Members of CTS and NIO rather bilaterally develop voluntary agreements and monitor them in quality circles without representatives of the corporate parent. These quality circles also aim at achieving commitment to common performance goals set by the corporate parent in order to prevent the pursuit of individual profits to the neglect of a high overall quality of the customer service.

To conclude, reciprocal interdependence between CTS and NIO requires flexible mechanisms of control in order to avoid subsequent errors in the course of resolving non-routine customer issues. This requirement is met by input control through interlocking personnel as well as social control, but not by process control. Coordination between the involved units, however, is hampered due to the fact that the units pursue different goals although their resources and activities are in a symmetrical relationship. That is why, in the sub-case customer service, the individual drives toward efficiency of CTS and NIO must be aligned with the collective objective of high service quality. This specific combination of control mechanisms results in a triad of input, social and output control.

4.3 Management Control of Pooled Interdependence: Sales Channels and Fleet Management

4.3.1 Sales Channels

A sub-case of pooled interdependence is the sales channels of the case study firm. Products and services of these operational units are distributed through seven channels that are organized as profit centers. In opposition to forms of transactional interdependence, multi-channel distribution is not differentiated by transfer or exchange but by pooling and sharing of resources and activities for achieving higher-level sales targets. By comprehensively governing these sales units ("multi-channel control"), the corporate parent aims, on the one hand, at gaining as many new profitable customers as possible and, on the other hand, at retaining existing customers by means of churn prevention and customer retention. For this purpose, the operational units must coordinate the sharing of sales channels.

When designing the systems for multi-channel control, corporate executives combine all four mechanisms, with only a slight under-emphasis on output control. The corporate parent defines goals for sales channels and measures their success on the basis of EBITDA results. The strategic decision to organize the sales channels as profit centers reflects the intention to foster competition among them up to a certain level. The challenge to management control, then, is to compose control

systems in such a way that competition does not jeopardize the attainment of overall goals: *"If the firm sets these sales divisions EBITDA targets, the way these divisions optimize may, in the end, not necessarily be in the interest of the firm as a whole"* (HU3/P19/196–200). By focusing on performance measures, sales units have a high degree of freedom of which they can take advantage in order to meet their own interests and goals. This diminishes social control: *"Then to say: 'And you two – why don't you get together and settle this between the two of you?' – is probably going to be difficult"* (HU3/P23/740–46). Therefore, corporate managers also define common goals for multiple sales channels and apply cross-unit performance measures (sales KPIs). Although this creates some counterbalance to competitive incentives in the control systems, individual profit-seeking of sales units at the expense of overall interests of the firm still prevails: *"If both sides take it seriously and optimize only their EBITDA, because they are controlled solely by means of their achievement in this regard, all we talk about is internal pricing. We don't talk any more about how we serve the market or about how we create an optimum result for the whole multi-business firm"* (HU3/P18/605–08). The negotiation of transfer prices and financial goals then is *"definitely a bit like bargaining at a Turkish bazaar"* (HU3/P17/122–25). In this regard, elements of social control (i. e., meetings on a regular or ad hoc basis) are almost misused by the sales channels. These meetings between representatives of the strategic business segments (i. e., Mobile Communication and Fixed Line & Internet) and the sales channels originally served the purpose of orchestrating sales activities in the best overall interest of the firm and allocating budgets accordingly. In fact, however, the sales units take this opportunity to drive up transfer prices and to fight for budget shares in order to pursue their own interests. *"So, there is not such a thing as a channel harmony in the classical sense"* (HU3/P24/235–37).

To restrict these self-interested behaviors, output control is supplemented with mechanisms of process control. As one middle manager noted, *"Output control [with quantitative measures] on its own is not the best […], because I don't want merely a maximization of transactions. That means, results control – yes, but only if I can add a differentiated process control"* (HU3/P18/533–39). The use of sales guidelines guarantees that the channels are pursuing comprehensive corporate goals and supplying standardized performance. Furthermore, corporate managers intervene from case to case if results of the sales units are not satisfactory: *"So, they say, those are the targets. If you have reached the targets, great – if not, you get process controlled: 'that's the way we do things now!'"* (HU3/P16/432–35). Hierarchical intervention, however, is only reduced to a few cases due to high supervision and control efforts and the required transformation knowledge: *"Process control [on a case-by-case basis] is a management control mechanism for us, which we only resort to in an emergency or if extraordinary circumstances render it absolutely necessary"* (HU3/P17/685–88). Nevertheless, if this case occurs and the corporate parent has to intervene, process control has priority: *"So, if we receive a clear order from the managing board, we make that our top priority; everything else is secondary. Process control comes before results control, so to speak […]"* (HU3/P17/675–82).

Within this frame of output and process control, social control can more effectively combined into the management control systems in order to foster participative decision-making. In the course of so-called "channel jour fixes," operational units

and sales channels bilaterally agree on budgets as well as quality and market targets. They also negotiate commissions and agree on measures of how the corporate parent's goals are to be operationalized. This complemental mechanism proves to be effective: *"Results control by means of tight goal setting and, above all, the more processes are stipulated, the more difficult it is for a single unit or individual to figure out their own decision and to control the interdependencies. […] It's true, self-coordination [among the participants of channel jour fixes] is the more effective control method. People react to changes, to environmental developments, to opportunities and risks and can coordinate to an extremely detailed extent"* (HU3/P20/543–68). The employees' participation in this process also enhances their motivation and willingness to cooperate: *"Cooperation and collaboration is incredibly complex. Although it has to be said that due to the scope for self-coordination, colleagues at work are highly cooperative"* (HU3/P24/382–84). The instrument of personnel interlocking has the same effect when it is additionally used, as in the sub-case of reciprocal interdependence: *"We [have] dedicated employees […], who look after these channels and thus always try to find a solution in conjunction with their counterparts"* (HU3/P17/446–50). These interface managers are experts of sales. They invest similar, however distributed knowledge in finding joint solutions.

According to Thompson (1967, p. 55) and others (Van de Ven et al. 1976; Van de Ven and Ferry 1980), situations of pooled interdependence come along with a comparatively low level of complexity and have low control requirements. However, this does not apply to the case study firm in general and the sales channels in particular. In this sub-case, the main challenge is to resolve the tension between specific demands of operational units on pool resources and activities and their standardization in order to reach economies of scale. This may only be achieved by mixing all four control mechanisms. The sub-case is also an example of how interactions between two control mechanisms depend on the presence of another mechanism. Output control undermines social control particularly when applied to the sales units separately. However, when process control is added to the control systems, a framework for more cooperation is provided and social control can emerge more effectively.

4.3.2 Fleet Management

In the course of the last decade, the case study firm has removed several tasks from the subunits and pooled them in shared service centers (SSCs). One of these centers, Corporate Fleet Management Services (C-FMS), is responsible for the fleet management of the case study firm, providing employees of the subunits with company cars and associated services. The central human resources department of the company (Corporate Human Resources, C-HR) commissions vehicles and communicates this to C-FMS via respective order forms. C-FMS purchases the cars from automobile manufacturers and makes leasing contracts with the subunits, in which the conditions of use are stated. Due to the centralization of the fleet management, the purchasing volume and the services of the case study firm can be combined, and hence economies of scale can be exploited. The collaboration results in pooled interdependence among the several users of the resources and activities of the SSC.

The challenge to the design of the control system is, then, to coordinate the use of the car pool and to align this shared use with the overall goals of the case study firm.

The primary control mechanism applied in the management of fleet services is process control. Above all, C-HR is accountable for a company-wide *Group Car Policy*, which sets rules and procedures for the use of the fleet services. The policy is refined and adjusted by the members of the *HR Group Council*, which is the central decision-making body for all HRM-related policies in the case study firm. Members are representatives of the chief HR offices, managers of C-HR and the HR directors of the subunits. The involvement of this council into the fleet management adds social control to the control system, but this mechanism is clearly secondary to process control for two reasons. First, although rules and procedures with binding character for the users of fleet services are primarily subject to the decisions of the council, these issues play only a minor role on the general agenda of the council. Rather, the members primarily adopt the perspective of the HR units and discuss topics such as service levels and equipment of company cars without bothering much for the financial implications for the whole company.

Second, since the affected units are insufficiently involved into the council, its legitimacy among fleet managers is called into question. This lack of representation is reflected in the fact that the representative of C-FMS in the council is its HR director rather than professionals in fleet management. Moreover, the responsibilities within the fleet management are inadequately defined: *"There is no mechanism in place that someone is called to order if the targets are exceeded because there is no one who is explicitly in charge of it. The C-FMS now says: 'I've got nothing to do with investments, I'm just a service provider and I just carry out' and the HR unit says: 'I don't have a budget, I just fill in forms'"* (HU4/P1/514–18). Further instruments of social control at lower levels of the hierarchy cannot compensate for these shortcomings. For example, expert forums with members of C-HR, C-FMS and the decentralized HR units take place on a regular basis. The results of these forums are recorded by C-HR, but the decision-making power remains with the HR Group Council. As a consequence, the willingness of organizational members to contribute to improvements of policies and procedures decreases: *"For us it's a bit awkward but we're just like let the HR unit rather discuss that"* (HU4/P1/625–26).

The way how the case study firm exerts process control on the fleet services also has implications for the application of output control. As an organizational unit with its own legal form, C-FMS has its own profit and loss statement as well as a separate balance sheet. C-FMS is hence controlled on the basis of its EBITDA results, which at the same time represent the basis for determining the bonus payments of the management. However, C-FMS cannot completely influence that the EBITDA targets are met because the process control imposes limitations to market-like exchange between the provider and users of fleet services. An important element of the car policy is the obligation for subunits to contract with the SSC. The purchase and equipment of company cars starts with the completion and submission of order forms by C-HR, and the leasing rates for company cars and other transfer prices are fixed. This excludes any freedom to negotiate options and extras individually. Such negotiations would balance the interests of the provider and the users,

but they would also result in deviations from the general policies and procedures. This would involve an increased effort of the SSC, which results in additional costs for the whole company. *"[The customer] can say as often as he likes: 'I'll do pay you for that!' Still, it's not possible because I'm basically not controlled via a result but via a budget and that's why I can't offer any bells and whistles. So, logically, it gets to a conflict, which is actually wanted to reach the goal of standardization"* (HU4/P3/283–93). Price adjustments would have possibly led to an internal increase in turnover on the part of the SSC, but they did not necessarily involve any profit improvement for the whole company.

To conclude, the pooled interdependence of subunits resulting from the shared use of fleet services requires a control system which supports the exploitation of economies of scale in accordance with the overall goal of the corporate parent to generate added value. Process control ensures high degrees of standardization of products and services, as required by economies of scale. For the same reason, policies and procedures are also designed to reduce output control, a potential driver of deviation from standards, to a supplemental mechanism with limited control impact. Process control is further combined with social control, but at this point organizational members complain about considerable deficits of the control system. The lower priority of social control as compared to process control, along with limited participation of both the SSC and the corporate controlling, provides little incentive to improve procedures and to care about financial implications. This demonstrates that it is not only important what mechanisms are combined into a control system but also, and perhaps even more, how they are combined.

4.4 Management Control of Intensive Interdependence: Product & Innovation Management and Marketing Campaigns

4.4.1 Product & Innovation Management

Product and innovation management (PIM) is an example of intensive interdependence between subunits of the case study firm. There are three units that are chiefly involved in the development of new products and innovations: Corporate PIM (C-PIM), Fixed Line & Internet PIM (F-PIM) and Mobile Communication PIM (M-PIM). While F-PIM and M-PIM are responsible for the product-specific development within the operating segments, C-PIM is in charge of R&D independent of products and innovation management across the organization. The three PIM units do not only collaborate with each other but also with marketing, sales and service units in order to prepare feasibility studies, trend analyses and product concepts. This collaboration aims at developing innovative telecommunications products as well as physical terminals, virtual network services or mobile televisions. As the convergence and platform-independent usability of products and services play an important role, no unit can achieve the goal alone. At the same time, the success of PIM would be at risk if one unit refused to collaborate.

The management control systems for intensive interdependence among the PIM units comprise all four mechanisms of control. This comprehensive design is a direct response to past failures when corporate managers made excessive use of perfor-

mance measures to independently control results of subunits, rather than interdependently. For example, Mobile Communication offered a contract tariff which allowed customers to make low-cost phone calls from their mobile from home. This resulted in many customers cancelling their fixed-network contracts with Fixed Line & Internet and solely using their mobile end device. Another example is the development of a telephone by Fixed Line & Internet which offered customers low-cost wireless phone calls via hot spots (W-LAN) when on the move. This innovation was in competition with mobile products of Mobile Communication: *"Due to the management control mechanisms implemented, Fixed Line & Internet did the same kind of thing as Mobile Communication. So, there was no need for coordination, people went out with the same customer proposal and, as a result, cannibalized each other"* (HU5/P32/33–36). This was an unintended effect caused by unit-specific financial objectives: *"As long as we steered division by division, by means of turnover goals, these kinds of cases kept cropping up and they will continue to do so"* (HU5/P32/129–31). The coverage of one case of cannibalization in some business media, finally, triggered the shift in corporate strategy which, in turn, required an extension and recomposition of the management control systems.

In the sub-case of PIM, performance of the involved units is now measured by common key figures (e. g., invention KPIs, time-to-market KPIs). Consequently, employees of F-PIM and M-PIM not only pursue unit-specific goals of product development and EBITDA targets of their business divisions but also company-wide product and innovation goals, to which "pay for performance" systems are also indexed: *"We have cross-incentives which encourage us to try to reach as good a balance as possible between the goals, so as to enhance the cooperation between the employees"* (HU5/P31/181–83). Besides this realignment of output control, the new management control systems lay stress on tightly coupled mechanisms of process and social control. Collaboration between the three PIM units is coordinated by the so-called Product Leadership Team (i. e., social control) under the supervision of the Chief Product and Innovation Offices, which comprise senior managers and product or innovation managers. This board takes decisions on prioritization and budget on the basis of business cases. A product roadmap is thereupon created. When it comes to realizing product concepts, operational models are applied. They describe the general process of product development (i. e., process control), define mile stones and competencies of the members of the organization: *"Of course, it is important that a certain amount of processes are prescribed, otherwise we would end up in total chaos"* (HU5/P31/498–99). The operational collaboration between different subunits is controlled by either function-specific boards (e. g., Marketing Leadership Team, Sales Leadership Team, Technology Board) or by cross-functional boards (e. g., Product Board, Innovation Board). *"The decision-making panels act as gates within the product development process, simply to ensure that the coordination and consensus of the relevant units in the firm, i. e. between executives and regions is guaranteed"* (HU5/P33/457–62).

The sub-case of PIM exemplifies that intensive interdependence among subunits requires most sophisticated management control systems. As regards the development of convergence products, intensive interdependence relationships between subunits lead to the fact that sub-goals and performance contributions of the units

can hardly be specified and evaluated. Since the involved units collaborate directly and intensively, outputs cannot be assigned to single units but can only be measured for the whole collaboration. The designing of control systems is further challenged by low levels of task programmability because product development and innovation management are affected by high market dynamics and unpredictability of future product requirements, which results in a high variability of tasks (HU5/P35/584–99). Furthermore, members of the PIM units possess extensive specialized knowledge about technology trends and future demands of their customers (HU5/P32/7–11). This brings about issues of controllability because members of the headquarters do not possess sufficient transformation knowledge about the interdependent performance relationships. Control interventions by superordinate units thus have low credibility among members of the PIM units: *"Headquarters has given instructions that the subunits or divisions did not follow because they said: 'What do the guys from headquarters want, do they want to tell us now how we should do our business?'"* (HU5/P32/77–80).

For the above reasons, output and process control, neither alone nor combined, are sufficient for governing cross-unit collaborations within product development and innovation management. The corporate parent may, in fact, set rough goals for the PIM units and decide on implementing product proposals. However, stronger controls in product development require sufficient personnel capacities and distinct transformation knowledge on the part of the controllers or other senior managers. Since these conditions are not met, process control is applied. At first glance, this seems to be contradictory because the outcomes of R&D activities are poorly predictable. However, the applied rules and procedures (i. e., standard operating procedures) only establish a rather general framework in order to provide a structure to the process and to avoid a lack of goal orientation, without affecting any details of R&D activities.

Due to this very general level of process control, it must be completed with other mechanisms. By additionally using social control and, to a lesser extent, input control, corporate managers can limit control interventions to exceptional situations and reduce control capacities accordingly (management by exceptions). Instead, social control fosters personal communication and interaction across the PIM units, and with it the exchange of knowledge and the alignment of interests. This fulfils two requirements that are typical for intensive interdependence: Control mechanisms that foster direct communication among the involved employees increase adjustability to complex and changing tasks. Including these mechanisms into the control systems thus responds to issues of low task programmability. For the same reason, social and input control compensate for a lack of transformation knowledge on the part of corporate managers and controllers because they empower experts to find solutions to technological problems themselves. This mitigates issues of controllability.

4.4.2 Marketing Campaigns

The marketing campaigns of the case study firm represent another case of intensive interdependence. They are aimed at tying regular customers in the long term to the company by means of loyalty measures or to increase profitability by means

of customer development initiatives. The implementation of marketing campaigns starts with analyzing and selecting relevant customer groups. This information is processed by Fixed Line & Internet Customer Relationship Management (F-CRM) and Mobile Communication Customer Relationship Management (M-CRM), respectively, and forwarded to the sales channels to implement the campaign on an operational level. There are three types of campaigns: outbound campaigns, inbound campaigns, and mailing campaigns. Outbound campaigns involve contacting the customer by phone through Customer Sales Services (CSS). Inbound campaigns are managed by Point of Sales Distribution (PSD) und Electronic Sales Channel (ESC) and address visitors of the stationary business and the website. In mailing campaigns, which are managed by F-CRM and M-CRM, respectively, customers receive an offer via e-mail or regular mail. These types of campaigns are directed at individual customers, which allows taking into account individual preferences and product requirements. This, however, requires a constant exchange of resources (e. g. customer information) as well as concerted activities. Only by integrating heterogeneous knowledge and capabilities, the complementarities of the subunits can be exploited in accordance with the overall goals of the case study firm.

In order to sustain corporate performance in the long run, one of the most important goals of the case study firm is to win the customer base of a strategic business area also for another business area (i. e. cross-selling, as opposed to upselling within one business area). Our focus is on this type of campaign because cross-selling involves several subunits in different business areas and is thus a particular challenge to the management control of cross-unit interdependence. As in other cases, the subunits are controlled by means of performance indicators such as EBITDA, but these unit-specific controls trade off cross-selling against upselling: *"I think we all have to make a turnover and EBITDA, so the goals are extremely competitive, of course"* (HU6/P23/366–71). The separation of responsibility for results entails that members of the organization rather want to win customers for their own business area than to contribute to acquiring customers for other subunits. The separation also has cultural consequences for the organization: *"How is it possible that we've been working together so well for years and now, there's suddenly a culture of mistrust? […] When I was in another accounting entity, I was treated differently"* (HU6/P25/552–56). This mistrust reduces social exchange between members of different subunits and is thus detrimental to social control. Consequently, a campaign manager concludes: *"Well, here we definitely had a gap in the control model"* (HU6/P23/376–84).

Corporate managers filled this gap with other instruments of output control as well as input and social control. First and foremost, they switched to performance indicators, which measure the overall success of a campaign across all subunits (HU6/P23/354–60). These "campaign- and cross-selling KPIs" are reported to the board of management due to their high strategic relevance (HU6/P26/308–12) and are included in the bonus payments of the involved unit managers. The behavioral implications of these changes in the control system are apparent to corporate managers: *"The conflicts of interest between the units have decreased because we set down an overall goal for the colleagues, which seems important to us here at corporate headquarters"* (HU6/P27/193–95). The growing emphasis on cross-unit output control has, in turn, an enhancing effect on social control: *"If I want to foster*

collaboration, I've to try and get goal congruence so that the units are a bit forced to work together" (HU6/P24/328–37). However, in spite of this intention of corporate managers, the line managers who are involved in cross-selling campaigns do not necessarily feel forced to collaborate: *"No, nobody forced us to do anything. We just said we've a customer in Germany who ideally is a customer of both of us [...] and we've set the goals and established control boards by making decisions completely on our own"* (HU6/P23/597–622).

The primary instrument of social control of cross-selling campaigns, besides more ad-hoc meetings, is a board called "control circle-CRM." It consists of both CRM-units and also of members of the Sales Channel Management (F-SCM and M-SCM). *"If you have a look into the official procedures of the company, you don't come across this control circle. But everyone knows it and everyone knows that it exists, and everyone thinks it's important"* (HU6/P23/675–77). F-CRM and M-CRM are responsible for implementing the decisions of the board and for coordinating the operative management of the campaigns. For this purpose, the members of F-CRM and M-CRM take a bilateral vote with the respective sales employees and they also vote across all channels in campaign jour fixes. Due to these interactions, stakeholders can participate in the development of campaign plans, by means of which the procedures of implementing the campaign are controlled (HU6/P22/385–403): *"The procedures have been developed together. [...] We've agreed on a procedure, and both sides stick to this procedure"* (HU6/P25/292–98). These self-defined procedures make process control by the corporate headquarters obsolete. Corporate managers admit that even if they tried to exert process control, they would be unable to do so because they lack of the relevant cause-effect knowledge: *"We simply don't have the means and the skills to actually control everything through to the last operations unit"* (HU6/P23/54–55). – *"And that's why we say that if the KPIs are right in the end, we simply don't care"* (HU6/P23/575–76).

The supplemental use of social control with participatory forms of process control compensates for some disadvantages of campaign budgets and related KPIs. To implement the campaign, the business areas provide a budget, which is coordinated by F-SCM und M-SCM and which is agreed upon with the respective CRM and sales units in the campaign jour fixes. While budgeting with subsequent monitoring of results requires that desirable goals are known ex ante, social control facilitates a constant review and adjustment of goals. This adds flexibility and adaptability to the control system and compensates for low task programmability: *"The result/profit control via goal settings isn't flexible enough [...]. Put extremely, it's like a ballistic flight: Once fired off, just about there's North, and that's where the rocket should hit. Self-control is actually the much more effective control in this case"* (HU6/P20/559–68). The same effect has the appointment of campaign managers who facilitate social exchange across involved subunits and thereby increase the responsiveness of the campaign to market developments.

To conclude, the intensive interdependence emerging from cross-selling marketing campaigns requires a shift from unit-specific toward cross-unit output control in order to prevent upselling and to provide incentives for collaboration. As intended by corporate managers, this shift paves the way for the bottom-up emergence of social control which counter-balances the limited adaptability of output control within

a planning period due to low programmability. Intensive interdependence requires a high degree of flexibility because the subunits' contributions to the nexus of resources and activities within the collaboration are hard to specify and to observe. Furthermore, the high dynamics of the market and growing product demands of telecommunications customers lead to a significant variability of task and problem definitions within the cooperation relations. The control system is further complemented, yet with less emphasis, by input and process control, which complete the full range of control mechanisms.

5 Discussion and Conclusion

In this paper, we examine how control mechanisms are combined into management control systems if different types of interdependence emerge between collaborating units of a multi-business firm. The results suggest that the configurations of management control systems vary significantly with the type of interdependence. The sub-cases show that there is no evidence of any kind of interdependence that is controlled by only one mechanism and of any mechanism that is applied across all types of interdependence to the same extent. Since there is no one-fits-all solution, it represents a profound challenge for a multi-business firm to configure management control systems. In our case study, corporate executives responded to this challenge by laying emphasis on process and output control in the case of sequential interdependence, by combining input, social and output control in cases of reciprocal interdependence, and by applying all four control mechanisms to intensive and pooled interdependence.

Our findings on management control of transactional interdependence (i. e., sequential and reciprocal interdependence) are to a large extent consistent with those of previous research (Table 1). More intriguing are the results concerning cooperative forms of interdependence which are crucial for multi-business firms to gain a parenting advantage. Our results imply that, under conditions of cooperative interdependence, the design and use of management control systems is particularly challenging because in this case, corporate managers attach similar high importance to all four mechanisms and thus have to orchestrate them carefully. The higher the complexity of management control systems, the higher is the probability of intended and unintended interaction effects between the components and, hence, the greater is the corresponding need to align compatible control mechanisms (Abernethy and Brownell 1997; Abernethy and Chua 1996; Caglio and Ditillo 2008; Ferreira and Otley 2009; Grandori and Soda 2006; Malmi and Brown 2008; Otley 1980).

The high control demands which we established for pooled interdependence are contrary to what previous research suggests. Thompson (1967) and some subsequent authors (Van de Ven et al. 1976; Van de Ven and Ferry 1980) assume that pooled interdependence is the least complex type of interdependence and, thus, puts the lowest demands on management control. Given this widespread assumption, the present findings are contrary to the trend toward less complex management control at decreasing levels of interdependence (Ambos and Schlegelmilch 2007; Gencturk and Aulakh 1995; Martinez and Jarillo 1991; Mascarenhas 1984; O'Donnell 2000).

More specifically, Chenhall and Morris (1986) show that managers perceive a broad scope and high integration of management accounting systems as less useful in the case of pooled interdependence than in cases of sequential or reciprocal interdependence. In contrast, we find control systems applied to pooled interdependence to be even more complex than when interdependence is transactional. The balanced use of input, process and social control with only a slight under-emphasis on output control also deviates from the pattern, found by Macintosh and Daft (1987), according to which the use of process control increases with the extent of pooled interdependence while the use of both input and output control decreases.

Intensive interdependence is hitherto the least-well researched type of interdependence in the literature (see Table 1). Most authors adhere to a typology in terms of pooled, sequential and reciprocal interdependence without taking into account intensive interdependence (Chenhall and Morris 1986; Macintosh and Daft 1987). Our study is among the first to empirically explore the management control of this kind of interdependence. Subunits become intensively interdependent if they co-create new bundles of resources within direct collaborations. In this case, the involved units recombine resources that are largely intangible and, thus, can hardly be transferred via well-defined interfaces. This is particularly evident in knowledge-intensive services such as the product and innovation management of the case study company. In an increasingly knowledge-driven economy comprising related-diversified firms, management control of intensive interdependence is crucial to multi-business firms that strive for synergies through cross-unit collaborations (Adler 2001). Our study sheds light on what the particular challenges of intensive interdependence are and how corporate managers cope with these challenges in the design of control systems. Within the limitations of a case study, the results suggest a complex configuration far beyond mere output and process control. However, the control demands of intensive interdependence still need more attention in future research due to their growing importance in the economy.

The manifestation of high intensity and complexity of management control in both cases of cooperative interdependence may, in part, be due to the specific case setting of our study. First, we are among the few scholars to explore management control of interdependence in a multi-business firm. Collective action problems tend to be more severe in multidivisional organizations than in single-business firms because business units within the M-form are economically, legally and managerially more autonomous than organizational units in the U-form (Chandler 1990; 1991; Galbraith 1973; Galunic and Eisenhardt 2001). Interests diverge strongly and competition increases significantly, in particular, if the corporate parent runs business units as profit centers and controls their results independently. Our sub-cases have provided evidence that corporate managers strive to mitigate unintended effects of unit-specific performance measures by adding mechanisms to the control systems which trigger the pursuit of collective goals. Aligning more divergent strategies, goals, structures and cultures of individual units, consequently, requires more complex control solutions in the M-form than in the U-form. In order to account for the specific setting of multi-business firms, more investigation into the configuration of their management control systems is needed.

Second, the demands on management control of cooperative interdependence is conditional on the corporate parenting style exerted by executives. The redesign of management control systems, as implemented in our case study firm, was preceded by a shift in corporate parenting away from financial controlling to strategic controlling and planning. The implementation of this new parenting style in strategic response to market developments required a broader use of mechanisms that are directed toward collective goals. This may explain why managers of the case study firm, except for the sub-case of sequential interdependence, evaluate cross-incentives and social control in an overly positive way. However, the managers' perceptions of the usefulness of control mechanisms may change over time. While new mechanisms may appear favorable at first glance, it is likely that their dysfunctions become apparent only over time when they have been broadly applied on a day-to-day basis. This may create cyclical patterns in the configurations of control systems, associated with waves of centralization and decentralization in the organization. Therefore, the design, operation and effectiveness of management control systems need to be analyzed in the context of the firm's history. There are still few longitudinal studies of how control systems evolve along their lifecycles (Cardinal et al. 2004, 2010) and how this evolution is punctuated with strategic choices at the corporate level (Abernethy and Chua 1996). Following this line of inquiry would engage the literatures on management control and corporate parenting in considerably more exchange than hitherto (Martinez and Jarillo 1991; Nilsson 2000).

Tracing the reasons why managers prefer some combinations but avoid others when managing interdependence, our study has also pointed to the interaction effects between control mechanisms that are used simultaneously. So far most scholars have considered control mechanisms separately, largely disregarding the various ways in which they affect each other. This has attracted an increasing amount of criticism in recent years (Caglio and Ditillo 2008; Cardinal et al. 2010; Malmi and Brown 2008). The lack of research on the interaction of control mechanisms is all the more surprising, considering that it is implicitly acknowledged in many studies. The earliest is by Blau (1955), in whose view misfits between particular mechanisms dampen the overall effectiveness of the control system. Later scholars have likewise acknowledged that individual management controls may reciprocally reinforce, substitute or undermine each other's effects (e. g., Abernethy and Brownell 1997; Abernethy and Chua 1996; Dent 1990; Fisher 1998; Otley 1980; Peterson 1984). In most cases, however, their remarks have been included in overviews of how further research needs to address deficiencies in the extant literature. It is only recently that a growing number of scholars have begun to call for investigations into the combinability of different control solutions (e. g., Alvesson and Kärreman 2004; Caglio and Ditillo 2008; Ferreira and Otley 2009; Grandori and Soda 2006; Kennedy and Widener 2008; Malmi and Brown 2008; Sandelin 2008) and the relevant research is therefore still at an early stage.

We expand on this body of literature by providing empirical evidence on both positive and negative interactions between management controls. A particularly interesting result is that some management controls substitute each other, showing dysfunctional effects. In such cases, managers avoid combining certain control mechanisms because the behavior of employees is directed toward organizational

goals more effectively when these controls are used separately, rather than in combination. Dysfunctional effects reflect the negative interactions that are observed when certain management controls mutually undermine each other's effects or when some control mechanisms crowd out others. For example, in the subcase of sales channels, a too tight output control by means of unit-specific performance indicators diminishes social control. In cases such as this, "less is better than more," because the partial effect of any single mechanism exceeds their combined effect. Negative interactions between control mechanisms are an important area of future research, because these findings revise the assumption that the use of more mechanisms results in better control. In fact, implementing too many control mechanisms in a non-coordinated manner can reduce the overall effectiveness of control systems and, as a result, jeopardize the successful attainment of organizational objectives. In sum, the effectiveness of a management control package does not necessarily increase with the number of control mechanisms it includes.

The historical contingency of management control systems within the institutional context imposes limitations on the present study. As our examination is based on the case study of a single multi-business firm, its findings are of limited generalizability. Future research should aim at cumulating findings across more case studies within different empirical settings. In this way, contingency factors other than cross-unit interdependence may be integrated into the analysis (Chenhall 2007). Further limitations arise from the conceptual framework of our study. With regard to the applied typology of control mechanisms, our study inevitably suffers from a general lack of conceptual consensus in the field of management control (for this criticism, see Cardinal et al. 2010; Malmi and Brown 2008). Our analysis focused on input, process, social and output control as these categories are fairly consensual within the great variety of definitions and distinctions in the academic literature. One of the challenges for future research is to arrive at more fine-grained typologies of control mechanisms that help to cross-validate empirical findings at a less broad level. These typologies could also consider informal controls to a greater extent than we did in the present study. Our focus was on formal controls that are deliberately combined into control systems.

These limitations notwithstanding, the present study adds to previous research on the management control of interdependence and combines it with the literatures on strategic management and international business. It shows how a shift in corporate strategy of a multi-business firm made a new parenting style necessary which, in turn, required a reconfiguration of the management control systems in order to generate added value from collaboration across subunits. Linking the macro level of corporate strategy with behavioral issues of management control design at the micro level is an important avenue for future research.

Appendix A

Interview Guideline

1. Introduction.
   Thank interviewee for agreeing to be interviewed, explain to her/him that all information s/he provide will be treated as confidential, introduce yourself as member of the research team and give a brief presentation of the research project, mention examples of previous case studies and contact persons hitherto, personal background/area of responsibility and competence/hierarchical position/organizational allocation of the interviewee.
2. Description of cooperation.
   Describe the cooperation between your business unit and [business unit]. Which goods and services are deployed/used/exchanged/jointly produced within the framework of the cooperation between your business unit and [business unit]? What would you say are the main properties and characteristics of the goods and services? Who receives the goods/services? What sort of knowledge is required/exchanged? Are other business units involved in/affected by the cooperation? How do these business units contribute to the cooperation? Is your business unit able to decide independently whether it cooperates with [business unit/s], or is it compelled in some way to contract? Can the goods/services be procured/cancelled internally and reciprocally or, must, instead, a third-party provider be brought in? Are the goods/services documented, i. e. laid down in a contract? What is the role played by the corporate parent in the cooperation between your business unit and [business unit/s]?
3. Interdependencies between the participating business units.
   Do interdependent relationships exist between your business unit and [business unit/s]? If so, please describe these. Can the goods/services be specified/delineated unequivocally, i. e. can they be attributed to a single business unit? How are these shared goods/services utilised/transferred/exchanged? Are the resources deployment/execution of activities run in parallel (time-wise) or successively, and are they process-related/reciprocal/intensive? Do input/output relationships exist (i. e. advance provision) between the goods/services provided by the business units? When is the work deemed to have been finished?
4. Added value and goals of cooperation.
   What added value results from the cooperation between your business unit and the [business unit/s] – from the point of view of the cooperation participants and that of the corporate parent? What are the (strategic) goals pursued by means of the cooperation (business units/corporate parent)? In your opinion, are there deviations of goals/interests between your business unit, [business unit/s] and the corporate parent? How are these goals/interests harmonized/coordinated? Who is involved in the harmonization/coordination process? Do people meet in person? Are the results of such meetings documented in minutes? Do conflicts of interest occur? How do these conflicts of interest affect your cooperation? How are conflicts of interest resolved? Who is involved in resolving such conflicts? Are

there rules for resolution of conflicts? How do these kinds of issues escalate (procedure/course)?

5. Management control of cooperation.
   Which coordination, or control instruments are employed within the cooperation between your business unit and [business unit/s]? How are the (separate) activities, goods/services harmonized/coordinated? How are the goals of the cooperation defined/set/agreed? How are the tasks/decision-making competences distributed/delegated? What key data do the participating units record and report? Who receives the reports (corporate parent/strategic divisions/controlling)? How frequently are these key data reported? Do participating members in the cooperation know each other's key data? Are there, in the cooperation, common key data, that measure the collective output? How are the collective results of the cooperation recorded/monitored? Can the results (costs/earnings) of single business units be allocated accordingly (source-related)? What other information about the cooperation is reported to headquarters? Which incentive systems (incentives/variable remuneration/management bonus) are implemented in your business unit? What goals/results/conditions are these incentives based on? Do internal pricing relationships exist between your business unit and [business unit/s]? How are these internal prices set? What is the role played by central management with regard to setting internal prices? Are the internally charged services/conditions comparable with (external) market providers? Are there general regulations/stipulations set within the cooperation? Are these rules laid down in documents (service level agreements/contracts)? To what extent does the corporate parent intervene in the procedures of your cooperation? How (frequently) do these interventions occur? Does coordination/harmonisation take place, either on a regular or ad hoc basis? Does harmonization/coordination occur in an institutionalized form (panels/committees/management teams, for instance), whereby decisions about the cooperation are taken jointly? Who is involved in these harmonization/coordination sessions? How often are such sessions held? Are employees permanently designated as responsible for management control tasks? Do co-signing/co-determination rights/approval procedures exist? Are budgets made available to the cooperation? How are these budgets recorded/monitored/reported? Are the control mechanisms employed in parallel, or coordinated with one another? Describe the relationships (influences/reciprocal effects) that exist between the control mechanisms. How effective, would you say, are these control mechanisms? What problems/difficulties occurred in connection with these control mechanisms? How are/were these problems solved? Which tasks does corporate parent/central controlling/central organization complete with regard to management control in the firm/within the cooperation relationship?
6. Problem areas and management control challenges.
   Describe the significant challenges/problems/critical success factors with regard to the cooperation between your business unit and [business unit/s]. Is there a common, unified understanding of tasks/problems among participating members of the cooperation? Are there differences of opinion among cooperation partners with regard to specialist issues? How are these resolved? How frequently are (specialist issue-related) queries raised within the cooperation? Do

members know who their contact persons are? How long have the participants been working together? Have measures been taken to foster reciprocal (specialist issue) understanding? To what extent do the challenges and problems tackled within the cooperation change? Who makes decisions about these changes? Are members within the cooperation aware of the reciprocal requirements? How are these reciprocal requirements communicated? What effect does the changeability of tasks and challenges have on the cooperation? Where, in your opinion, do the benefits/limitations lie with regard to the management control mechanisms employed to tackle problems? What tasks does the corporate parent complete with regard to problem-solving?

7. Conclusion and outlook.
   Are there any other relevant aspects that we have not yet covered in our conversation? Can you name other contacts from [business unit/s] and/or corporate parent, other business units/possible examples of case studies? Can we contact you if we have any queries? Thank the interviewee.

Appendix B

Table B.1 Coding Scheme for Types of Interdependence

Category	Definition	Coding rules	Anchor statement examples
Sequential interdependence	Unilateral, serial transfer of resources/ activities	A transfer of resources and activities, which can be delineated and specified, takes place between business units	*"The customer phones Customer Service, Customer Service places the order in the system and directs the call to us. We hook up the customer to the network and they are able to make phone calls immediately."* *"The invoices come in to us, we book them and the booking information is forwarded to the business units."* *"So, in terms of workflow, it is a process that runs in a chain from right to left: starting in the Call Center, you direct the order to Diagnosis and the Sales Team in the field solves the customer's problem."* *"They rely on our input, i. e. they carry out further processing of our output."*
Reciprocal interdependence	Reciprocal, simultaneous transfer of resources/ activities	An exchange of resources and activities, which can be delineated and specified, takes place between business units	*"The involved units are each reciprocally dependent on effective upstream handling by the other."* *"What we have here are reciprocal relationships, because every mistake that cannot be remedied downstream or mistakes that occur downstream, lead to problems for us."* *"Marketing cannot produce any analyses without our data and by the same token we cannot work without their input."* *"There are some processes where we are driven by local input and from our side, we return specifications which must be fulfilled if there is to be an effective realization."*
Pooled interdependence	Shared use of resources/ activities	Shared use of resources and activities of a pool unit occurs	*"Our job is to supply the entire firm with cars and to assure mobility."* *"All business units based in Germany use our services."* *"We are providers within the firm for all business units which require scan services and back office support."* *"We purchase for all business units of the firm."*
Intensive interdependence	Bundling of resources/ activities for joint task fulfilment	Shoulder-to-shoulder cooperation occurs between business units, thus ensuring that superordinated task-oriented goals are fulfilled	*"We have jobs that we execute together. What we strive to achieve are shared solutions, because we see the customer as one shared customer, instead of two separate ones."* *"The goal of our collaboration is a communication campaign on the market that is as harmonised and coordinated as possible."* *"We work closely with Communication Managers in the business units and develop a unified communication campaign – a joint task."* *"It's like this: the separate business units cannot function without the others."* *"So, we are all working towards a common goal, otherwise we couldn't achieve convergence of our products."*

Appendix C

Table C.1 Coding Scheme for Mechanisms of Control

Category	Definition	Coding rules	Anchor statement examples
Input control	Business units are allocated human, material and/or financial resources before they set about their task/s	Business units receive budgets and/or materials from the corporate parent; corporate parent assigns designated employees to the business units who are responsible for management control tasks	*"Well, we have a sales budget and then we have to see to it that we fulfil our tasks as best we can with the budget available."* *"They get a budget from us and then we leave them more or less to get on with it as they see fit."* *"I have an employee on the team who is at the disposal of the CCS as contact and who then, of course, has a very close working relationship with their CCS colleagues."* *"We have designated people who look after these channels and try, in conjunction with their relevant counterparts, to find solutions so that the channel has a chance of meeting its sales goals."*
Process control	Corporate parent defines and implements rules and procedures for task fulfilment on the basis of hierarchical authority	Rules and procedures are specified and monitored by the corporate parent (permanently, for a certain period of time or on a case-by-case basis)	*"Central standards are set for the process, and there is no discussion about them [...] this is how we try to exclude deviations as far as possible."* *"The process is clearly and precisely defined here; there are no alternatives."* *"Those are usually special cases, where the board intervenes on certain issues and takes on a managing, controlling role."* *"Then the managing boards have to say which procedure they think is the best, as opposed to another."*
Social control	Decentralized, horizontal interaction between firm members on the basis of defined criteria, or rules	Within the collaboration, members of the involved business units reach a consensus and coordinate themselves, coordination is binding	*"With regard to product introductions, we have coordination round table meetings which we all attend."* *"We have a monthly steering board, at which all business units are represented."* *"Because that's important to us, we meet and sort it out together at the meeting."* *"Then the responsible people from the various different divisions meet and discuss the problem."*
Output control	Hierarchical target-setting, monitoring and evaluation of goals for single business units or for several business units	Within the collaboration, the involved business units are set individual and/or collective goals/targets by the corporate parent; performance is controlled and evaluated independently or jointly on the basis of goal achievement	*"Headquarters set us certain targets and part of our management bonuses are indexed to how well we achieve the goals set."* *"The KPIs are set up in such a way as to show the performance of every single firm, with as few external influence factors as possible, so that the firms can take matters into their own hands."* *"The units are set the same goal by head office and if one of them fails to achieve it, then none of them have."* *"We all have the same joint cross-selling goals which are linked up to one another."*

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