Processes and controls
in the finance organization of companies

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I. Abstract

Efficiency considerations in organizations that were traditionally brought upon by finance organizations are increasingly applied to finance organizations themselves. At the same time, finance organizations face stricter compliance requirements while they are still expected to provide stakeholders with timely and relevant information. In consequence, quality, cost and compliance targets have to be met. To attain performance levels more effectively and efficiently, finance managers have different management tools and mechanisms at hand. This dissertation consists of three papers. They revolve around the central themes of process orientation and management controls. The papers pursue different research objectives and, accordingly, employ different research methodologies. Paper 1 focuses on process orientation and process management in particular and tests their effect on performance in the management accounting function. Analyzing a proprietary empirical dataset, I can show that both process standardization and process management yield better information quality and result in competitive advantages gained through the management accounting function. Paper 2 tests the effect of formal and informal controls on the quality of information and the satisfaction with the cost level in the accounting function. Results of an empirical dataset indicate that certain but not all controls have a direct impact on information quality and an indirect effect on the satisfaction with the cost level through higher information quality. Paper 3 addresses the topic of triggering events in the asset impairment accounting context as regulated by IAS 36. Methodologically, the paper gathers instructions by standard setters, corporate practice, and insights as gained by a case company. Based on these findings, the paper proposes a systematic and structured triggering events framework and designs a process to introduce the framework in the case company. Fundamentally, the dissertation provides empirical evidence of a significant positive effect of process orientation and certain types of management controls on performance in specific functions within the finance organization.

II. Zusammenfassung

Effizienzbestrebungen in Unternehmen treffen die Finanzorganisation zunehmend selbst. Gleichzeitig begegnen Finanzorganisationen erhöhte Compliance-Anforderungen, während unverändert die Erwartungshaltung gegenüber der Finanzorganisation zur Bereitstellung von genauen und relevanten Informationen besteht. Leistung in der Finanzorganisation umfasst somit mindestens die Erreichung von Zielen bezüglich der Dimensionen Leistung, Kosten und Compliance. Finanzleiter haben zur Steuerung und Erreichung der Performance-Ziele verschiedene Einflussmöglichkeiten. Die vorliegende Dissertation umfasst drei Artikel, die sich zentral mit den Themen Prozessorientierung und Steuerungsansätzen (englisch: management controls) befassen. In Artikel 1 wird der Einfluss von Prozessorientierung und Prozessmanagement auf Performance in der Controlling-Funktion untersucht. Die Analyse eines Datensatzes aus einer empirischen Erhebung belegt, dass Prozessstandardisierung und Prozessmanagement einen signifikanten Einfluss auf die Informationsqualität und den wahrgenommenen Wettbewerbsvorteil haben. In Artikel 2 wird der Einfluss von formalen und informalen Steuerungsansätzen auf Informationsqualität und die Zufriedenheit mit dem Kostenniveau in der Accounting-Funktion untersucht. Daten einer empirischen Erhebung indizieren, dass bestimmte formale und informale Steuerungsansätze direkt einen Einfluss auf die Informationsqualität in der Accounting-Funktion haben. Artikel 3 befasst sich mit Wertminderungsindikatoren im Rahmen des regelmäßig durchzuführenden Werthaltigkeitstests von Vermögensgegenständen gemäß IAS 36. Basierend auf einer Analyse von Instruktionen von Rechnungslegungsgremien, der Anwendungspraxis von Unternehmen und Einsichten in ein kooperierendes Fallstudienunternehmen wird ein systematisches und strukturiertes Wertminderungsindikatoren-Framework sowie ein Prozess für dessen Einführung für das Fallstudienunternehmen diskutiert und erarbeitet. Grundsätzlich kann in dieser Dissertation der empirische Nachweis für einen positiven Einfluss von Prozessorientierung und bestimmten Steuerungsansätzen auf Leistung in bestimmten Funktionen innerhalb der Finanzorganisation erbracht werden.

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VII. Abbreviations

ACMAR	Annual Conference for Management Accounting Research
AOS	Accounting, Organizations and Society
APQC	Productivity and Quality with Performance Measures & Metrics
AVE	Average variance extracted
BPM	Business Process Management
BPMJ	Business Process Management Journal
BU	Business Unit
CFO	Chief Financial Officer
CGU	Cash-generating unit
CR	Composite reliability
DACH	Germany, Austria, Switzerland
e.g.	Exempli gratia
ERP	Enterprise resource planning
ESMA	European Securities and Markets Authority
FREP	Financial Reporting Enforcement Panel
GRC	Governance, risk, compliance
EBITDA	Earnings before interest, taxes, depreciation and amortization
FTE	Full-time equivalent
HQ	Headquarter
i.e.	Id est

IAS	International Accounting Standards
ICAEW	Institute of Chartered Accountants in England and Wales
IFRS	International Financial Reporting Standards
IGC	International Group of Controlling
IT	Information technology
JIAR	Journal of International Accounting Research
JIFMA	Journal of International Financial Management & Accounting
JoMaC	Journal of Management Control
KPI	Key performance indicator
M&A	Mergers and acquisitions
MA	Management accounting
PCF	Process Classification Framework
PMMC	Performance Measurement and Management Control
PO	Process orientation
PLS	Partial least squares
RBV	Resource-based view
S.D.	Standard deviation
SCA	Sustainable competitive advantage
SEM	Structural equation modeling
SFAS	Statement of Financial Accounting Standards
SSC	Shared service center
US GAAP	United States Generally Accepted Accounting Principles

1 Introduction

1.1 Motivation for dissertation project

Finance organizations in companies have been subject to changes in a variety of dimensions. Efficiency considerations that traditionally have been brought upon other organizational units by the finance organization are increasingly applied to the finance function itself (Deloitte, 2011; Herbert & Seal, 2012). Exemplary for this development stand insourcing and even outsourcing efforts of processes in the finance organization.[1] These sourcing decisions are pursued with the goal of service improvement and simultaneous cost optimizations. Finance organizations have to provide different stakeholders with useful and relevant information (Bruns & McKinnon, 1993). While the management accounting function (also called the controlling function in large corporations in German-speaking Europe) centrally provides management with business-relevant information, the accounting function is involved in different steps regarding the preparation, processing, and publication of information – also to external stakeholders. In the face of changing disclosure requirements and updates of accounting standards, particularly the accounting function has to address these intensified requirements and ensure compliance. Likewise, the management accounting function increasingly faces information requests and demands to add value as a business partner (Granlund & Lukka, 1998). In short, finance organizations have to fulfil the needs of different stakeholders with regard to quality, cost and compliance while facing changing requirements stemming from their internal but also their external environments. Otherwise, if finance organizations are not able to produce relevant information in an effective and efficient manner, they could gradually lose relevance in organizations (Mahlendorf, 2014).

[1] In line with the ICAEW framework, the finance organization in this dissertation project consists of four core functions: Accounting, management accounting, governance, risk, and compliance (GRC), and finance.

Addressing different research gaps related to management controls and a process-oriented organizational structure in the finance organization, this dissertation consists of three papers that each contributes to theory and practice in a different manner. Two papers place emphasis on the accounting function and one places emphasis on the management accounting function. The papers help scholars and practitioners to improve their understanding on how to achieve better performance with regard to cost, quality or compliance in the respective function. Accordingly, the three papers pursue different research objectives and embrace different research methods. Paper 1 tests the effectiveness of formal and informal controls as applied in the accounting function within the finance organization. Here, the effectiveness of controls is tested on the quality of information and also the satisfaction with the cost level. Paper 2 tests the effects of process management and process standardization in the management accounting function. Implications of the exerted degree of process orientation are analyzed with regard to the decision-usefulness of information and the competitive advantage as gained through the management accounting function. Papers 1 and 2 derive hypotheses and research models from the literature. Survey data is collected and research models are tested applying structural equation modeling methodology. Paper 3 takes in a more specific perspective and looks at the impairment process within the accounting function and addresses vague guidance as given by the impairment accounting standard IAS 36. The paper collects data from literature, standard setters as well as historic impairment data and interview insights that were gained from a case company. The paper establishes a framework of triggering events for the accounting function. Based on interviews in the case company, the paper also discusses the use of the framework in the organizational goodwill impairment testing process. Table 1 displays an overview of the three papers and compares the three research projects along central criteria.

Paper Title →	**Paper 1** Process orientation in the management accounting function	**Paper 2** Effective accounting processes: The role of formal and informal controls	**Paper 3** Triggering events in asset impairment accounting
Research questions	Are process orientation and process management effective management practices in the management accounting function? Do they lead to competitive advantages?	Are formal and informal controls effective management controls in the accounting function? Do they improve the perceived cost level?	What does a systematic impairment-testing framework in compliance with IAS 36 look like?
Research goal	Testing the effectiveness of certain characteristics of process orientation in the management accounting function	Testing the effectiveness of formal and informal controls in the accounting function	Developing a triggering event framework to systematically assess the recoverable amounts of assets
Theories/topics touched upon	Control theory, dynamic capability theory	Control theory	Agency theory, IAS 36
Data collection	Survey (cross-sectional)	Survey (cross-sectional)	Interviews and ERP access in a case company
Research method	Theory testing by means of structural equation modeling	Theory testing by means of structural equation modeling	Inductive development of a framework

Table 1: Overview of papers

As reflected in the title of this dissertation, there are two central themes or pillars to my research that takes place in the finance organization of companies. Management controls resemble the first pillar, whereas the second pillar revolves around processes.

A first pillar of this dissertation is the analysis of the effectiveness of certain types of management controls. Despite the already long existence of efficiency optimization efforts within the finance organization, empirical findings show mixed satisfaction levels of supportive and transactional business services, both regarding cost reductions and service quality (e.g., Janssen & Joha, 2006). This indicates governance issues related to management controls that empirical research does not clearly address. In this dissertation, management controls are understood as all mechanisms and combinations of mechanisms that company management can employ to achieve organizational goals (Abernethy & Chua, 1996; Malmi & Brown, 2008). Central in this research project and in line with Merchant & van der Stede (2007) is the notion that management controls also address employee behavior. Therefore, the effectiveness of formal and informal controls is analyzed in this dissertation. To understand the context of management controls in this dissertation, three hierarchic layers in the finance organization are considered. First, the finance organization or one of its key functions, e.g., the accounting or management accounting function, are typically headed by an accounting or controlling head or a finance head that also assumes responsibility for one or more if its key functions. On a second level and below these heads, there is a layer of middle management with a specific responsibility within the key function. In the management accounting function, examples of this middle layer would be the head of results planning or the head of forecasting. The third layer that is considered in the context of management controls is the employee level. Employees carry out the very tasks. Their respective mid-level management supervises them. Management controls are applied to control and steer behavior on an employee level so that, ultimately, organizational goals can be achieved. The functional or mid-level management is responsible for the enforcement of management controls.

The second pillar of this cumulative dissertation is the concept of process orientation. Originally introduced in organizations as a concept to counteract strict functional organizational orientations, companies decided to focus on business

processes to drive customer orientation. The finance organization and particularly the management accounting function had to align their processes accordingly. Process orientation and process management have been shown to lead to superior process and even firm performance (Frei, Kalakota, Leone, & Marx, 1999; Kohlbacher & Reijers, 2013) and to increased competitiveness (Zairi, 1997). Both approaches are also associated with competitive advantages (Manrodt & Vitasek, 2004). Hence, a process-oriented organizational structure is increasingly proposed (Davenport & Short, 1990). Most findings, however, stem from research on primary business processes and have not been verified in or applied to the finance organization. Process orientation in the finance organization so far has mostly received attention in the form of process alignment (e.g., Fullerton et al., 2014). More recently, managerial practice can see a new wave of process orientation coming towards the finance organization. Related to this new trend, the concepts of process orientation and standardization are increasingly applied to the finance organization. Corporate practice has seen the emergence of process standards that are available for the accounting function and, more recently, also for the management accounting function. As part of this dissertation, I analyze the effects of process orientation and process management by means of a large-scale empirical study. Survey-based empirical evidence is scarce related to the effects of process orientation and process management (Trkman, 2010). In light of this scarcity of empirical evidence and the recent emergence of process standards for the finance organization, I explore the effectiveness of process orientation and process management in the management accounting function within the finance organization.

1.2 Research context: The finance organization

Within the research scope of this dissertation project are different functions in the finance organization. I classify the finance organization into four main functions. The classification for the finance organization has been adapted from the framework as proposed by the ICAEW (2011). The adaptations result in the four activity sub-groups of accounting, controlling, governance, risk, and compliance (GRC), and finance. The accounting function bundles activities associated with the entry, processing, and consolidation of financial information (Everaert, Sarens, & Rommel, 2010). The

management accounting function produces decision-useful information for corporate management to monitor financial and operational results (Bruns & McKinnon, 1993). Through these analyses, the function is also responsible for setting organizational objectives and acts as a business partner for management. It thus has to show a high degree of business orientation (Burns & Baldvinsdotti, 2005; ICAEW, 2011). The governance, risk and compliance (GRC) function encompasses all activities related to external and internal compliance requirements but also includes activities dedicated to risk management (ICAEW, 2011). Finally, the very finance sub-function embraces activities in the finance organization concerning treasury and financing needs within the organization (ICAEW, 2011).

Two of the three papers in this dissertation have sought to test hypotheses related to process orientation and controls. For this purpose, a large-scale empirical survey has been conducted. Thereafter, the responses as given by participants were analyzed to test the hypotheses. The questionnaires that were filled out for the first two papers in this dissertation were answered by managers of the finance head or key-function-head level, i.e. the first level of the explained conceptualization in the finance organization. This was primarily due to the fact that those persons that filled out the questionnaire possessed sufficient knowledge about the different functions within the finance organization. Further, even though these persons are not responsible for enforcing the controls themselves, their responsibilities necessitate knowledge about their design and depth. Accordingly, open-comment sections in the questionnaire did not yield notable remarks about the inability of respondents to answer the questions.

The two activity groups within the finance organization of particular research interest in this dissertation are the accounting function and the controlling function (also often referred to as the management accounting function). Efficiency considerations are already widely applied to the accounting function. This is indicated by a relatively high share of activities within this function that are insourced to a shared service center (SSC) or outsourced to an external provider. The controlling function has so far not witnessed this trend towards shifting activities to shared service centers to a similar degree. Still, based on interviews in the course of this dissertation project, companies increasingly consider the employment of shared service concepts even in the controlling function. Table 2 shows that the accounting function and the

controlling function are the largest functions within finance organizations in terms of full-time equivalents (FTE). The results are based on a proprietary data set that has been collected in the course of this dissertation project. Table 3 displays insights into sourcing decisions in the finance organization. The data can illustrate that within the finance organization shared service centers are most established for accounting activities of responding companies. Shared services are used least for the finance sub-function. Instead, most finance and funding activities are done locally or at headquarters (HQ). For companies that use shared service centers, the sub-function with the smallest share of activities done locally or at headquarters is the accounting function. Another finding of this study, sourcing activities from external providers does not seem common in finance organizations of participating companies. The overall share of sourced services from third-party providers appears immaterial.

Activity group	Accounting	Controlling	Governance, risk, compliance	Finance	Other	Total
FTE distribution across the finance organization	50.9%	27.6%	5.9%	6.5%	9.1%	100%

N=59

Table 2: FTE split across different activities in the finance organization

What percentage of activities is performed locally, by a SSC, or by a third party?		Activities done locally (division, BU etc.) or at HQ	SSCs used	external providers used	Total
Accounting	▪ Accounts payable ▪ Accounts receivable ▪ Invoicing and billing ▪ Fixed asset accounting ▪ Inter-company accounting ▪ …	36%	56%	8%	100%
Controlling	▪ Internal reporting ▪ Forecasting ▪ Budgeting ▪ Scorecards ▪ …	77%	22%	1%	100%
Governance, risk, compliance	▪ Due diligences related to mergers & acquisitions ▪ Risk management ▪ Taxes ▪ Regulatory activities ▪ …	74%	23%	3%	100%
Finance	▪ Debt financing ▪ Equity financing ▪ Treasury ▪ …	86%	13%	1%	100%

24 out of 59 respondents indicated to employ a shared service center in their finance organization. For those 24 respondents, mean values have been calculated to show the activity split across the finance organization in case SSCs are employed.

Table 3: Percentage split of sourcing decisions in the finance organization

Adding to the insights as presented in Tables 2 and 3, the following Figures 1 to 4 provide further insights into structural characteristics of the finance organization. Figure 1 compares the satisfaction with the cost level across the four main sub-functions in the finance organization – accounting, controlling, GRC, and finance. The finance sub-function shows highest satisfaction levels, while the accounting function exhibits lowest satisfaction rates. This is a peculiar finding in light of high employment rates of accounting shared services centers among the responding companies. Figure 2 compares the accuracy of produced information between the different sub-functions within the finance organization. Generally, satisfaction levels appear high across all four functions. The highest satisfaction levels with produced information can be found in the finance sub-function, followed by the accounting function, whereas lower satisfaction with the accuracy of information can be found in the controlling function as well as in the GRC function. As exemplified by Figure 3, the sub-functions show a greater variation with regard to the standardization of processes. The highest level of process standardization is exhibited by the accounting function, whereas controlling processes are least standardized as indicated by respondents. This provides evidence that process standardization is not widely established in the controlling function. Paper 1 addresses this circumstance and explores implications and benefits of process standardization and process management specifically in the management accounting function. Finally, Figure 4 presents a comparison of the scope of tasks between the four different sub-functions. It can be shown that the accounting function ranks highest in the number of different tasks and services, while the finance sub-function shows the smallest scope of activities. The depth of tasks and services in Figure 4 largely corresponds with the FTE split across sub-functions as presented in Table 2. Paper 3 addresses a particular process in the accounting function. Given the lack of clear guidance by standard setters, an impairment testing process is designed and proposed that focuses on the topic of the identification of triggering events.

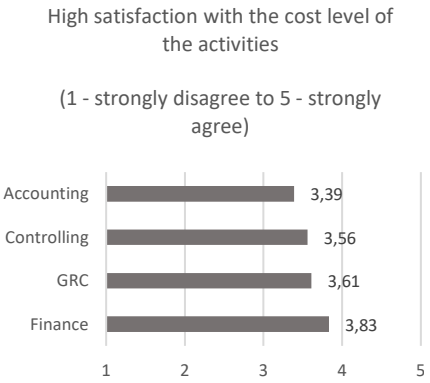

Figure 1: Cost-level satisfaction

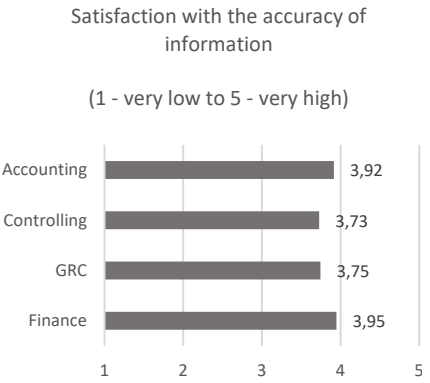

Figure 2: Accuracy of information

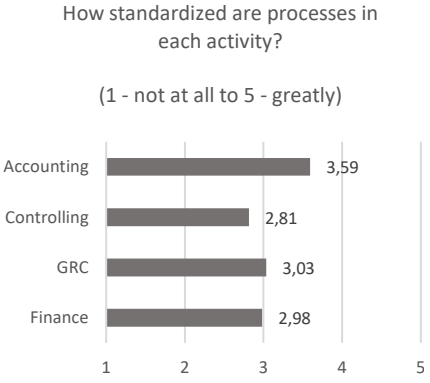

Figure 3: Standardization of activities

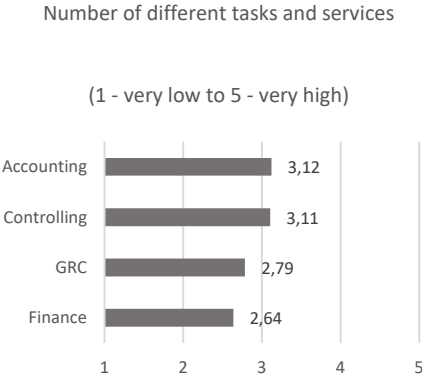

Figure 4: Number of tasks and services

1.3 Overview of the three papers

1.3.1 Paper 1: Process orientation in the management accounting function

Thomas Gackstatter
University of St. Gallen

Abstract: Business process management (BPM) has been shown to be a useful management practice to improve process and even firm performance. In line with the emergence of increasingly complex organizational set-ups and the ensuing relevance of process management, corporate management accounting practice had to adapt to this surge in process orientation as well. While research in this context so far has primarily addressed the alignment of management accounting practices with organizational processes, this paper tests the effectiveness of process standardization and process management applied to the management accounting function (MA function) itself. Based on a survey among finance and accounting managers in Germany, Austria, and Switzerland, this paper can provide evidence of a mediating effect of process management in the relationship between process standardization and information quality. Moreover, evidence is found that useful information in the MA function mediates and explains the relationship between process management in the MA function and the perceived competitive advantage. Overall, the findings can show a positive effect of process-related capabilities in the MA function and can hint at the usefulness of process standards that start to establish themselves in corporate management accounting practice.

Status:

- ACA Working Paper Series
- Currently in second-round review for publication in the *Business Process Management Journal* (BPMJ)
- This version is included in chapter 2 of this dissertation

1.3.2 Paper 2: Effective accounting processes: The role of formal and informal controls

Thomas Gackstatter, Benedikt Müller-Stewens, Klaus Möller
University of St. Gallen

Abstract: Cost considerations are increasingly applied to the finance organization, particularly to routinized accounting processes. Mixed satisfaction levels related to performance outcomes and cost levels hint at control issues in the finance organization. Accounting activities are characterized by well understood task environments that are addressed by formal controls. Yet, these activities are also interrelated and people-intensive, which might require other controls complementing formal ones. While current evidence considers merely the role of formal controls, we examine the effect of formal and informal controls as well as their combinations on cost-level satisfaction through information quality in accounting processes. Regarding formal controls, results from a cross-sectional survey indicate that process controls have a positive direct effect on information quality while we cannot show any effect for output controls. Among the informal controls, peer pressure accentuates the effect of process controls. Third, the working environment has a positive impact on information quality. Finally, all effective controls and control combinations have a significant indirect effect on cost-level satisfaction through higher-quality information. This contributes to literature on three dimensions: First, we underline the role of informal controls in accounting processes; second, examining controls in their combination adds to mere isolated analyses; third, we introduce cost-level satisfaction as a performance variable in the finance organization.

Status:

- ACA Working Paper Series
- Earlier version accepted and presented at the *14th Annual Conference for Management Accounting Research* (ACMAR) in Vallendar, Germany, in March 2017

- Re-conceptualized paper, accepted and presented at the *9th Conference of Performance Measurement and Management Control* (PMMC) in Nice, France, in September 2017
- This represents the latest version of the paper which is included in chapter 3 of this dissertation
- Preparation of submission to *Journal of Management Control* (JoMaC)

1.3.3 Paper 3: Triggering events in asset impairment accounting

Thomas Gackstatter, Klaus Möller
University of St. Gallen

Abstract: Asset impairment regulations according to IAS 36 require companies to carry out an impairment test if impairment indicators or triggering events are observed. While goodwill must be tested for possible impairments at least annually, impairment tests on goodwill also need to be carried out in the presence of impairment indicators, making triggering events particularly relevant in interim financial reporting. IAS 36 and SFAS 142/144 show a similar logic in impairment accounting, but provide both only limited guidance on what constitutes a triggering event in detail. Drawing on analyses of annual reports, guidance of standard setters, and access to impairment-related information of a case company, this study elaborates a triggering event framework for a company from the automotive industry that helps the company carry out the impairment process more efficiently and also acts as a systematic early-warning instrument between the corporate center and local management.

Status:

- ACA Working Paper Series
- Earlier version accepted and presented at joint AOS/JIAR International Conference in Augsburg, Germany, in July 2016
- The most recent version of this paper is included in chapter 4 of this dissertation
- Preparation of submission to *Journal of International Financial Management & Accounting* (JIFMA)

1.4 Conclusion and contributions

The papers in this dissertation project make different contributions to the effectiveness of management controls and process orientation in the finance organization. Overall, I can find empirical evidence for the effectiveness of both central themes in this dissertation. I can establish significant direct effects of process-related constructs and management controls on performance outcomes in the finance organization. Process-related practices and management controls can both positively influence information quality in the analyzed sub-functions of the finance organization. While I can find evidence for the effectiveness of all tested process-related variables, results are not as clear for the effectiveness of the tested management controls. For management controls, results have to be looked at in greater detail because certain controls do not seem to have a significant impact on performance in the finance organization while other controls and control combinations exhibit a significant effect. Having established the effectiveness of controls and process orientation in the finance organization, this dissertation further proposes a process in the impairment-testing context in the face of scarce guidance by standard setters.

Complete findings and contributions of the articles are discussed in the three single papers. This chapter gathers the core contributions made to the literature and to managerial practice.

1.4.1 Contributions to the literature

Two papers in this dissertation develop and test hypotheses related to the effectiveness of management controls and process orientation in the finance organization of companies. Paper 1 deals with the management accounting function while Paper 2 looks at the accounting function. As both functions are part of the finance organization, the performance outcomes of both show similar dimensions and characteristics. Essentially, the outputs of both functions are financial information. Therefore, performance of both functions share the performance attributes of information accuracy, timeliness, and relevance (Abernethy & Vagnoni, 2004; Lee, Strong, Kahn, & Wang, 2002). With the more recent advent of information technology in organizations, information-related performance characteristics have led to the

development of even separate research fields dealing with information quality and management information systems (Lee et al., 2002) that this dissertation partially draws from. However, these attributes have long been of relevance in the finance organization. Although referring to accounting information systems, Anthony (1956) has called for company-specific, multi-dimensional management control systems that address financial and non-financial information in an accurate, relevant, and timely manner (Abernethy & Vagnoni, 2004). Besides relevant, accurate and timely information, providing management with decision-useful information is a task and performance goal within the finance organization that has particularly been attributed to the management accounting function (Bruns & McKinnon, 1993; ICAEW, 2011). Therefore, Paper 1 that deals specifically with the management accounting function adopts the decision-usefulness of information as a performance dimension as well. Papers 1 and 2 employ a survey-based research design. Therein, the different performance dimensions are operationalized as survey items. Noteworthy, the multi-item, composite performance constructs show high levels of internal reliability.

A core research subject in this dissertation is the topic of management controls in the finance organization. Joshi & Randall (2001) summarize different findings in the research landscape with regard to the direct effectiveness of management controls. Papers 1 and 2 test the effectiveness of different management control types. Adding to Joshi & Randall (2001), significant direct effects of management controls and the management practice of process management on the tested performance outcomes can be shown in both papers. Further, Paper 2 can make several contributions by providing evidence on the efficacy of certain formal and informal controls in the accounting function. Some results produce interesting findings that contradict traditional control theory. Besides, a new performance outcome of cost-level satisfaction can be introduced to measure the effectiveness of activities in the finance organization. Also, the relevance of controls for the assessment of cost levels in the finance organization can be highlighted.

Paper 1 focuses on process orientation (PO) specifically in the management accounting function. Of particular interest are the structural characteristic of process standardization and the management practice of business process management (BPM), a concept that contains management control elements. The paper contributes

to the literature by introducing PO and BPM to the management accounting function. Their usefulness in the management accounting function can be shown. The paper provides evidence on two mediating effects and can also contribute to prior assumptions as found in the literature, e.g. as proposed by Manrodt & Vitasek (2004) who link certain practices related to process orientation with competitive advantages. This paper can show that, when applied to the management accounting function, process standardization and process management enable higher performance that in turn leads to competitive advantages.

Paper 3 takes an exploratory research approach by designing and proposing a certain process in the finance organization by means of a case study research design. In the context of the asset impairment test as prescribed by IAS 36, the paper envisages a systematic triggering event framework. It adds to Comiskey & Mulford (2010) who gather different triggering events as presented in financial statements of US companies. Paper 3 further adds by complementing a reporting perspective of large European companies, classifies the impairment indicators into certain categories, and suggests a specific design process. The framework has been developed in collaboration with a case company in the automotive industry.

1.4.2 Contributions to managerial practice

Besides contributions to the literature, the three papers in this dissertation project each make contributions to managerial practice as well. First of all, the papers provide empirical evidence that management controls and practices that can be initiated and influenced by management can have a positive impact on information quality, i.e. performance, in the finance organization. Regarding the accounting function with its many well-understood tasks, certain formal controls have been shown to be more useful than other mechanisms in the hands of management. Specifically, process controls appear to significantly drive information quality in the accounting function, whereas output controls do not seem to have an impact on the performance. Opposing traditional control theory, informal controls in the form of positive working environments have been shown to be a strong driver of performance in the accounting function. Paper 1 presents empirical findings that show a significant positive effect of process standardization and process management on performance in the management

accounting function. Also, a high degree of business process management in the management accounting can be linked to competitive advantages through higher-quality information. This is a noteworthy finding in light of low levels of process standardization in the management accounting function compared to other functions in the finance organization (see Figure 3). Finally, Paper 3 provides management clear guidance on how to design a systematic impairment testing process with a specific focus on the identification of triggering events at balance sheet dates and interim balance sheet dates. The formalized triggering event identification process is designed as a practicable process that helps adopters to systematically and rigorously determine the recoverability of asset values. Thus, it can help meeting the demands of internal and external auditors on impairment testing schemes. The paper proposes a framework and foresees implementation issues that need to be considered for a successful implementation.

1.5 References

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2 Paper I: Process orientation in the management accounting function

2.1 Introduction

In an effort to emphasize business processes rather than functional hierarchies, the concept of process orientation (PO) has been increasingly applied by organizations (Reijers, 2006). By pursuing PO, companies seek to focus on processes, their outcomes, and the recipients of these outcomes (Davenport & Short, 1990). Processes can be understood as activity sets that transform inputs into outputs using organizational resources (Zairi, 1997). The concept of PO can be considered as one of the more recent innovations in organizational management practices. It has been associated with a number of benefits to organizations that apply it and embraces different dimensions (see Kohlbacher, 2010).

This research project focuses on PO and, in particular, business process management (BPM) as pursued in the management accounting (MA) function. While PO generally represents a commitment by companies to focus on business processes (Reijers, 2006), BPM is a specific and structured management approach or a tool to improve PO (Roeser & Kern, 2015; Zairi, 1997). In line with van der Aalst et al. (2003, p. 4), the term BPM can be understood as all "methods, techniques, and software to design, enact, control, and analyze operational processes." PO and BPM have been associated with a number of positive outcomes. By showing a high level of PO or BPM, companies benefit from fewer errors, improved process performance, higher customer satisfaction, or a higher innovativeness (e.g., vom Brocke and Schmiedel, 2014; Gustafsson et al., 2003; McCormack, 2001).

Besides performance improvements that have been shown for companies that apply PO and BPM, the two concepts are also deemed relevant research subjects from a resource-based view (RBV) and dynamic capability perspective (Nadarajah, Latifah, & Kadir, 2014). Highlighting the importance of business processes, Porter (1991) claims that the exploitation of resources through business processes is a source of competitive advantage rather than resources per se. PO-related characteristics and

BPM in particular have been named as key attributes for companies to sustain competitive advantages (Hung, 2006). For instance, harmonized process landscapes and standardized processes are regarded as drivers of competitive advantages for companies (Manrodt & Vitasek, 2004).

PO in the MA context of this research project is less understood as the mere alignment of the MA function with organizational processes. This concept of process alignment in the MA function has already received attention by scholars, as research surrounding activity-based cost management or the balanced scorecard have shown (Chenhall, 2008). For instance, the alignment of primary business processes and management accounting processes has been shown to improve operational performance (Fullerton, Kennedy, & Widener, 2014). Instead, this research project takes a new path by looking at the effectiveness of process standards and process management applied to the MA function itself. In times of the emergence of process standards for the MA function in companies, such as the process classification framework of the APQC, or the IGC controlling process model, a first research objective of this paper is to test the effects of standardized processes and the impact of process management on performance. The effects are tested in the MA function, an enabling corporate function that usually deals with the effectiveness and performance of other organizational entities. As a second research objective, the presented research model tests the effect of BPM in the MA function of companies to sustain competitive advantages. Methodologically, the research model is tested analyzing a dataset of 59 questionnaires completed by senior-level accounting or MA managers. To date, BPM research has mostly produced insights based on case study research settings (Houy, Fettke, & Loos, 2010; Trkman, 2010). In line with growing practical interest, survey-based research is increasingly applied to test assumed cause-and-effect relationships (Houy et al., 2010).

The organization of this paper is as follows: Section 2 gives a review of the literature related to PO and BPM, gives a short introduction to resource-based view (RBV) and dynamic capability theory, and develops the hypotheses for the context of the MA function. Section 3 outlines the research design. Section 4 presents the statistical results of the structural equation model. Section 5 discusses the results and concludes the paper.

2.2 Theoretical development

2.2.1 Process orientation and business process management (BPM)

The focus on processes in organizations is not a new phenomenon (Davenport & Beers, 1995). PO in a narrow sense was introduced by Michael Porter in 1985 when he introduced the value chain to conceptualize an activity-based theory of the firm (McCormack, 2001; Porter, 1985). With a focus on the alignment of business processes and strategic processes, Porter suggested an organizational structure that would focus on customers and would lead to a competitive advantage (McCormack & Johnson, 2001). With the concept of business process redesign, Thomas Davenport and James Short (1990) built on previous motivations and conceptualizations of PO. They also proposed redesigning business processes around the newly available IT infrastructures. At the same time, Michael Hammer coined the term business process reengineering (BPR), also proposing a customer-oriented and IT-driven PO (Hammer, 1990; McCormack, 2001). Both concepts address potential conflicts between the horizontal process perspective and the vertical (i.e., functional) perspective (Davenport, 1993; Hammer & Stanton, 1999). Although the concepts of business process redesign and reengineering are considered to be discontinuous efforts of organizational change and reorganization (Kohlbacher, 2010; O'Neill & Sohal, 1999), both gave rise to the continuous management approach of BPM (Hung, 2006; Roeser & Kern, 2015).

BPM subsumes methods and techniques to design and control operational processes. It combines elements and concepts from several organizational dimensions (Hung, 2006; van der Aalst et al., 2003). BPM goes beyond radical and project-driven process reengineering efforts. The literature lists different design characteristics and principles associated with BPM (Hung, 2006; Kohlbacher, 2010; Zairi, 1997). First, companies that pursue BPM techniques show a high customer orientation by focusing on activities that horizontally create links between organizational functions. BPM further mandates adopters to properly define, map, and document processes as well as formulate process outcomes. Thus, effective BPM can enable the measurement of formalized processes and their outcomes. Another key characteristic of BPM are elements of continuous improvement. To continually optimize procedures, benchmarking of best practices is an established BPM approach. BPM also includes

a cultural perspective. A common understanding of PO and BPM must be present in organizations. Employees and managers must possess relevant BPM-related skills and must be trained accordingly. BPM-related topics and characteristics also include an IT perspective, as Roeser and Kern (2015) note. Houy et al. (2010) and de Morais et al. (2014) propose a life-cycle view of different BPM-related activities. According to their classification of life-cycle stages, process measurement and continuous process improvement efforts take place at fairly mature stages. Fundamentally, unlike BPR, BPM calls for constant control, management, and improvement efforts with regard to business processes (Kohlbacher, 2010; Smith & Fingar, 2003).

2.2.2 BPM and the MA function

Management accountants seek to provide management with timely and decision-useful information (Bruns & McKinnon, 1993). As Otley et al. (1995) note, management accountants must satisfy managers' information needs for longer-term and short-term operational needs. This imperative has not changed and is even more relevant today in light of more recent trends and demands on the MA function towards business orientation or multi-dimensional performance management (Burns & Baldvinsdotti, 2005; Järvenpää, 2007). In the wake of increasingly global and complex organizational set-ups, the formation of matrix-style organizations (Knight, 1976), and the ensuing relevance of PO and BPM, corporate MA practices had to adapt to this surge in organizational PO (Chenhall, 2008). This is because MA as part of general management must also adapt to developments and changes in general management practices (Granlund & Lukka, 1998b). Otherwise, if MA practices are not aligned with other organizational structures, they might be ineffective (Rowe, Birnberg, & Shields, 2008). However, despite the long existence of process thinking, the role and design of the MA function in process-oriented organizations entered the spotlight in MA research later (Otley et al., 1995). To date, most research on PO in MA relates to process alignment. While Fullerton et al. (2014) found that MA processes aligned with strategic initiatives improve operational performance, their conceptualization of simplified management accounting processes focuses on the alignment of MA processes and not on BPM with its many dimensions in the MA function.

A current development related to PO in MA is the emergence of process standards that are available for application in the MA function, for instance, the PCF standard as marketed by the APQC or the IGC controlling process model. These standards have been designed to bring the benefits of PO and BPM to the MA function itself. However, to the best knowledge of the author, there is no large-scale empirical evidence available that explores the usefulness of PO and BPM in the MA function.

2.2.3 BPM and capabilities

To gain competitive advantages firms must possess valuable resources. They must further have the capabilities to exploit these resources and to transform them into competitive advantages. Originated in strategic management research, resource-based view (RBV) theory uses a firm's set of resources and capabilities to explain competitive advantages (Barney, 1991). Corporate management has to develop strategies and find ways to effectively use the controlled resources to sustain competitive advantages and generate superior returns (Grant, 1991). Resources in companies are diverse in nature and can range from certain assets and knowledge to human capital (Barney, 1991). An expansion of RBV theory, dynamic capability theory focuses on a firm's capabilities and agility to achieve sustainable competitive advantages (SCAs) in the face of environmental dynamics (Teece, Pisano, & Shuen, 1997). BPM as a management approach with its defining characteristic of continuous improvement aligns business processes with external and internal developments and has been considered a capability for a potential SCA (Weerawardena & Mavondo, 2011). Adding to this, Teece (2000) stresses the importance of knowledge assets that – if not easily imitable – can be the source of SCAs. BPM in general and BPM from a dynamic capability perspective in particular lack supportive empirical evidence (Trkman, 2010). The latter has been considered a promising research direction to further underscore the relevance of BPM as a beneficial approach in corporate practice (Nadarajah et al., 2014).

2.2.4 Hypothesis development

The concept of PO embraces different dimensions (see Kohlbacher, 2010). A first dimension of PO that this research project focuses on is the structural characteristic

of process standardization. Generally, standardized processes are associated with fewer errors and, thus, a better process outcome quality (Davenport, 2005; Ramakumar & Cooper, 2004). Process standardization promises benefits from economies of scale and skill (Kobielus, 1997; Wüllenweber, Beimborn, Weitzel, & König, 2008). Consistent process standards across the organization have been shown to increase firm performance (Frei, Kalakota, Leone, & Marx, 1999). Management accounting standardization has become increasingly important for large and global organizations (Lukka, 2007). Standardized, ERP-backed processes and systems are considered the backbone of effective MA and are considered helpful for decision-making (Madapusi & D'Souza, 2012). Applied to the MA function, standardized MA processes will enable management accountants to provide more relevant and more decision-useful information, for instance in the context of management reporting or forecasting, and, thus, lead to higher MA performance (H1).

Among the defining characteristics of BPM are benchmarking initiatives (Hung, 2006). To enable effective benchmarking and reach best practice process performance, processes must be standardized (e.g., Fong et al., 2001). Process standardization has been shown to improve the measurability of outputs and thus facilitates easier control and management of processes (Fong et al., 2001; Umble, Haft, & Umble, 2003; Wüllenweber et al., 2008). Hence, effective process management requires standardized processes. Vice versa, it means that process standardization enables and leads to a higher process management intensity (H2).

It has been shown that PO can improve overall firm performance (Frei et al., 1999; Kohlbacher & Reijers, 2013). However, as Ray et al. (2004) note, firms may possess unique capabilities that do not necessarily translate into higher firm performance. Because firm performance often is a too highly aggregated dependent variable (Ray et al., 2004), these capabilities may rather be reflected in the effectiveness and outcomes of business processes. As posited by Bruns and McKinnon (1993), the MA function must provide management with useful information relevant for decision-making. Thus, a more direct outcome of MA performance is the quality of information produced by the function. Consequently, in line with Tushman and Nadler (1978), MA performance is measured with a composite variable that reflects the relevance, reliability, timeliness, and decision usefulness of

information provided by the MA function. PO and BPM have been shown to lead to superior process outcomes and performance in various research settings (e.g., Frei et al., 1999; McCormack, 2001). Particularly, process improvement efforts, as a key component of BPM activities, can make processes more effective, efficient, and adaptable (Zairi, 1997). A process-oriented MA function that adopts BPM is, therefore, assumed to produce more timely and more relevant information (H3).

As hypothesized, process standardization has at least two implications. First of all, it was argued that process standardization leads to a higher MA performance (H1). Second, it was proposed that process standardization leads to higher intensity of BPM use (H2), and that BPM improves MA performance (H3). Taken together, these hypotheses back the assumption that process standardization has an indirect effect on MA performance that is mediated by BPM (H4). In the following, the four hypotheses are summarized.

H1: High process standardization levels lead to a higher MA performance.

H2: High process standardization levels lead to a higher intensity of process management in the MA function.

H3: Process management leads to higher MA performance.

H4: The relationship between process standardization and MA performance is mediated and explained by process management in the MA function.

PO and process management have been shown to lead to superior process and performance outcomes (Kohlbacher & Reijers, 2013), but have also been associated with increased competitiveness (Zairi, 1997). Further, Ray et al. (2004) as well as Manrodt & Vitasek (2004) argue that business processes and their effective management are a source of a competitive advantages. Adopting Grant's (1991) RBV perspective and addressing his strategy formulation process, this study regards organizational processes as resources. Standardized processes and the active pursuit of BPM require knowledge and are, therefore, considered as capabilities in this

research context. The capability to effectively execute processes enables companies to have higher process and operating performance and thus allows them to gain a competitive advantage (Nadarajah et al., 2014; Rosemann & vom Brocke, 2015). Consequently, a high BPM use leads to a competitive advantage (H5).

A high-performing MA function is able to produce timely and relevant information. Thus, the MA function as the information producer and processor in a company can enable corporate management to make better decisions. Higher-quality information has been shown to lead to superior performance (Preuss, 2003). An effective MA function can, therefore, contribute to a firm's competitive advantage (H6).

As proposed in H3, BPM is a key driver of MA performance or information quality. H6 posits that high MA performance leads to a competitive advantage. BPM in the MA function can, thereby, indirectly lead to a competitive advantage through higher MA performance (H7). This would add to Preuss (2003), who shows that information quality acts as a mediator between performance systems that include continuous improvement elements and performance outcomes. This line of argumentation leads to the following three hypotheses. Finally, Figure 5 presents the research model.

H5: Process management in the MA function enables companies to gain a competitive advantage.

H6: High MA performance contributes to a firm's competitive advantage.

H7: The relationship between process management in the MA function and a competitive advantage is mediated and explained by a high-performing MA function.

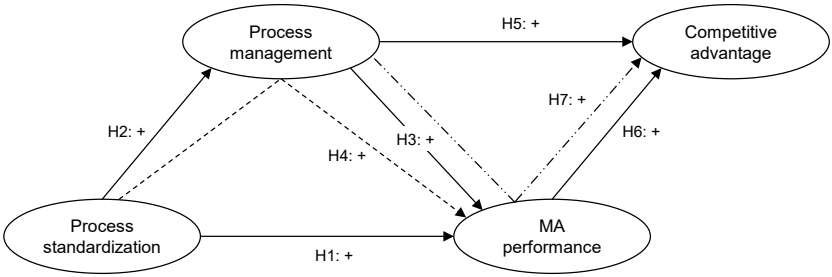

Figure 5: Hypotheses of direct and indirect effects in the research model

2.3 Research design

2.3.1 Data collection

This study examines different aspects of PO in the MA function in corporations. After the review of the literature, the research team interviewed three senior-level representatives of Swiss and German companies that worked in an MA or an accounting-related position. The interviews ensured the topic's practical validity and confirmed the hypotheses. This first stage was followed by the construction of the survey instruments. The resulting questionnaire was pre-tested by three finance and accounting executives as well as five researchers. The cross-sectional, online-based survey was open to participation for six months. The gross sample size consisted of 449 companies. The list originated from a company list from the Amadeus database featuring large firms in the DACH region (Germany, Austria, and Switzerland) and was complemented with further companies. Potential financial managers were contacted through telephone or email requests. After the data collection, 59 questionnaires excluding pre-tests were completed. The resulting response rate of 13% is due to the fact that participants had to be knowledgeable about different functions and activities in the finance organization. Thus, senior-level financial managers were targeted in the course of the data collection. This limitation has cost the survey a substantial number of respondents. From the survey's targeted geographic reach, about two-thirds of the completed questionnaires came from Swiss

company representatives. The analysis of the final dataset did not yield significant differences between early and late respondents regarding the constructs used in the survey. On average, participating companies employed 19,700 employees and generated annual sales revenues of 5.9 billion Euros. Given the rather low response rate, I tested for differences between early and late respondents and found no significant differences concerning model variables. Also, I did not find any significant differences between the 59 responding companies and the remainder of the gross sample set of companies concerning annual sales revenues and the number of employees. Thus, no evidence for a nonresponse bias was found (Armstrong & Overton, 1977).

2.3.2 Measures

Constructs and items have mostly been taken and adapted from extant survey-based research. As the targeted respondents represented companies from Germany, Austria, and Switzerland, the questionnaire asked about the controlling function. *Controlling* is the common term in German-speaking corporations and many global organizations for the MA function. The independent variables covered the extent of process standardization and the extent of process management. Three dependent variables are employed in the research model. The first construct deals with performance in the MA function. The second outcome variable is related to the perceived competitive advantage gained through the function. The independent construct of process management is, in fact, both an independent and a dependent variable. The next sub-chapters provide an overview of the constructs that have been used. Despite its dual function as a variable, process management has been classified as an independent variable in the following sub-chapters.

2.3.3 Independent variables

The two antecedents were related to the PO of participating companies. Respondents had to indicate the process standardization level and the intensity of process management in the MA function. For reasons of simplicity and practicability, the level of process standardization was operationalized with a single-item question adapted from Wüllenweber et al. (2008). On a five-point scale (from 1 = not at all to 5 =

greatly) adopted from Watjatrakul (2005), respondents were asked how standardized processes in the MA function were. The construct of process management in the survey was operationalized with a four-item scale. Items were taken from extant literature and expanded. Following insights gained in the interviews prior to the survey, the construct addressed different dimensions of BPM and process control. The dimensions relate to the monitoring of process procedures, their constant evaluation, their modification, and the existence of formalized escalation routines in case of process performance issues (Gustafsson et al., 2003, p. 235; Jaworski, Stathakopoulos, & Krishnan, 1993, p. 68; Xu, Besant, & Ristic, 2003, p. 1102). On a five-point scale (from 1 = *strongly disagree* to 5 = *strongly agree*) participants were asked if (I) it is monitored to which extent established procedures are followed, if (II) the procedures that are used to accomplish tasks are constantly evaluated, if (III) procedures in the management accounting function are modified when desired results are not obtained, and (IV) if there are clear escalation routes and guidelines in case of service issues.

2.3.4 Dependent variables

The construct of MA performance reflects different dimensions of information quality in the MA function. As previously developed, performance in the MA function was measured by adopting items concerning the dimensions information timeliness, reliability, usefulness, and relevance. Concerning timeliness, respondents were asked on a scale (from 1 = *strongly disagree* to 5 = *strongly agree*) to indicate if in the management accounting function (I) requested information arrives immediately upon request (Bouwens & Abernethy, 2000, p. 237). Regarding information reliability, respondents were asked to indicate on a five-point scale (from 1 = strongly disagree to 5 = strongly agree) whether (II) information produced in the management accounting function "represents what it purports to represent" (Artz, Homburg, & Rajab, 2012, p. 458; Christensen & Demski, 2003, p. 427). To test for the usefulness of information in the MA function, an item from Lee et al. (2002, p. 144) was taken and adapted. Respondents had to assess (from 1 = strongly disagree to 5 = strongly agree) if (III) information produced in the management accounting function is useful to the work of its destined users. The fourth constituting item of the MA performance

construct relates to the relevance of MA information. Based on Artz et al. (2012, p. 458) and Lee et al. (2002, p. 144), respondents had to indicate, on the same scale, whether (IV) information produced in the management accounting function is relevant to the work of its destined users.

The second outcome variable in the survey relates to resourced-based view theory. Two items including scales were taken and adapted from Watjatrakul (2005, pp. 410–412). The items reflect Barney's (1991) and Grant's (1991) notion of capabilities and competitive advantage and, for the given research model, were adapted for application in the MA function. On a scale from 1 = *not at all* to 5 = *greatly*, respondents were asked (I) to what extent they thought the conduct of management accounting activities required facilities and technical skills that were unique to their companies. Respondents were further asked, on the same scale, (II) to what extent they believed the management accounting function enabled their company to gain a competitive advantage.

Multi-item constructs were created taking arithmetic means of the constituting items. Missing data was not a major issue since only four items out of 649 analyzed items were not answered. Thus, the mean imputation approach was employed to fill the missing data points (Hair, Anderson, Tatham, & Black, 1998).

2.4 Analysis and results

2.4.1 Model specification

To analyze the proposed research model, PLS structural equation modeling (PLS-SEM) is used. Primarily, this is because the complexity of the model with two dependent variables and possible mediating effects cannot be meaningfully addressed by simple multiple regression analysis. PLS-SEM combines elements from principal component analysis and multiple regression and allows one to analyze complex models even with small data sets (Hair, Hult, Ringle, & Sarstedt, 2014; Hair, Ringle, & Sarstedt, 2011). The software used to analyze the structural equation model was SmartPLS 3.2.6 (Ringle, Wende, & Becker, 2015). The typical approach when applying PLS-SEM is a multi-stage process involving the specification of the overall model as well as the evaluation of the outer (measurement) model and the inner (structural) model. The outer model explains how constructs (latent variables) relate

to their constituting indicators, while the inner model defines the relationships between the constructs (Chin & Newsted, 1999). Among the constructs used in the research model, there are reflective multi-item measures and single-item measures. Unlike formative indicators, reflective indicators are manifestations of the corresponding latent constructs. Thus, relationships between latent constructs (or variables) are generally considered to be causalities (Chin, 1998; Jarvis, Mackenzie, & Podsakoff, 2003; Nunnally & Bernstein, 1994). The research model includes a construct that consists of one item. Hair et al. (2014) clearly state that PLS-SEM models may include single-item measures.

2.4.2 Outer model

In the following, indicator reliability, internal consistency, convergent validity, and discriminant validity of the variables are tested (Hair et al., 2011; Henseler, Ringle, & Sinkovics, 2009). In a first step, indicator reliabilities are looked at to decide whether items must be removed from constructs. Outer loadings should be above 0.7 and should be considered for removal for values between 0.4 and 0.7 (Hair et al., 2014). In scales that are not well established, loadings may be below the 0.7 threshold. Items with loadings below 0.4 should not be kept in the construct (Hulland, 1999). Table 4 provides an overview of factor loadings. Three items show loadings between 0.6 and 0.7. In line with Hair et al. (2014), the items are kept to ensure content validity. Item reliabilities are not strictly adhered to in survey research. For instance, Birkinshaw et al. (1995) keep items with loadings greater than 0.6. A sufficient internal consistency is reflected by composite reliability values above 0.6 (Bagozzi & Yi, 1998), or more conservatively, above 0.7 (Hair et al., 2014). The composite reliability considers the individual reliability of items based on their inter-correlations and is better suited to indicate internal consistency than the Cronbach Alpha metric (Hair et al., 2014). As Table 5 shows, composite reliabilities of the multi-item constructs were all above 0.79. Thus, they are above the mentioned threshold levels. To ensure sufficient convergent validity, literature suggests that average variance extracted (AVE) values should come in above 0.5 (Bagozzi & Yi, 1998). AVE is the arithmetic mean of squared loadings of items in a construct with the overall construct. All multi-item constructs show AVE values that are above the threshold with values above 0.55, as

Table 5 shows. Discriminant validity is a measure of distinction between different constructs. There are two approaches to test for sufficient discriminant validity (Hair et al., 2014). The first method is to test whether all loadings of items on their constructs are higher than cross-loadings on other constructs. Table 4 provides evidence that this condition was met for all items. The second approach to ensure acceptable discriminant validity levels is the Fornell-Larcker criterion, which requires one to look at the square root of the AVE coefficients. The square root values of all AVE coefficients must be higher than the correlation of the construct with other constructs (Fornell & Larcker, 1981). Table 5 indicates that the Fornell-Larcker criterion was met for the employed constructs. In terms of cross-loadings, the single-item measure of process standardization showed low loadings on the remaining constructs in the survey, as Table 4 shows. This underscores that the single-item measure is not part of the remaining multi-item measures but instead contains new information.

						Cross-loadings			
		Min	Max	Mean	S.D.	(1)	(2)	(3)	(4)
(1)	MA performance 1	1	5	3.52	1.01	**0.60**	0.35	0.32	0.22
	MA performance 2	2	5	3.92	0.77	**0.78**	0.36	0.31	0.30
	MA performance 3	1	5	4.02	0.83	**0.88**	0.35	0.40	0.16
	MA performance 4	3	5	4.10	0.68	**0.80**	0.33	0.31	0.17
(2)	Process management 1	1	5	3.22	1.01	0.35	**0.80**	0.29	0.30
	Process management 2	1	5	3.12	0.94	0.24	**0.77**	0.17	0.32
	Process management 3	1	5	3.74	0.89	0.37	**0.65**	0.08	0.30
	Process management 4	1	5	3.47	0.96	0.38	**0.75**	0.16	0.26
(3)	Competitive advantage 1	1	5	3.03	1.07	0.13	0.16	**0.65**	-0.01
	Competitive advantage 2	1	5	3.34	1.00	0.48	0.23	**0.96**	0.11
(4)	Process standardization	1	5	2.81	1.05	0.28	0.39	0.09	**1.00**

Table 4: Descriptive statistics, cross loadings

					Correlations and SQRT root of AVEs			
	Mean	S. D.	CR	AVE	(1)	(2)	(3)	(4)
(1) MA performance	3.89	0.63	0.85	0.60	**(0.77)**			
(2) Process management	3.39	0.73	0.83	0.55	0.46***	**(0.74)**		
(3) Competitive advantage	3.19	0.88	0.79	0.66	0.36***	0.23*	**(0.81)**	
(4) Process standardization	2.81	1.05	(-)	(-)	0.28**	0.39***	0.05	**(1.00)**

†p<0.15, *p<0.10, **p<0.05, ***p<0.01 (two-tailed), N=59.
SQRT = square root, S.D. = standard deviation, CR = composite reliability, AVE = average variance extracted.
The numbers in parentheses reflect the square roots of AVE values.

Table 5: Descriptive statistics, Pearson correlations, convergent validity, and discriminant validity

2.4.3 Inner model

After the validation of the measurement model, hypothesized relationships between the used constructs are analyzed. A bootstrapping procedure with 5,000 iterations is carried out to test direct and indirect path coefficients for their significance (Preacher & Hayes, 2008). The results show that, of the four hypotheses, only one has to be rejected. Table 6 presents statistical results for the structural or inner model. They are illustrated in Figure 6.

Hypothesis 1 proposed that process standardization leads to a higher MA performance. The results indicate no significant effect (path coefficient of 0.115, p-value of 0.359) between the two variables. Hence, hypothesis 1 had to be rejected. Hypothesis 2 argued that high process standardization leads to an increased extent of process management. The statistical results provide evidence that there is a positive and significant positive effect of 0.391 (p-value of 0.001) between process standardization and process management. Thus, hypothesis 2 is not rejected. In hypothesis 3, it was argued that high process management levels lead to increased MA performance. With statistical evidence on a positive and significant relationship (path coefficient of 0.410, p-value of 0.000), hypothesis 3 was not rejected. Hypothesis 5

suggested a positive relationship between the intensity of process management and the perceived competitive advantage gained through the MA function. The statistical results show no significant effect between process management and the perceived competitive advantage (path coefficient of 0.046, p-value of 0.796). Thus, hypothesis 5 had to be rejected. Hypothesis 6 assumed a positive effect of MA performance or decision-useful information in the MA function on the perceived competitive advantage. With a significant and positive path coefficient of 0.426 (p-value of 0.002) hypothesis 6 was not rejected.

Further knowledge about the effects of PO in the MA function can be gained by testing for two possible mediating effects as hypothesized with H4 and H7. In the research model, process management may potentially mediate the effect between process standardization and MA performance. As a second potential mediating effect, the relationship between process management and a firm's competitive advantage through the function may be explained by MA performance as a mediator. Common mediator-testing methodology stipulates testing for two occurrences. The first requirement to diagnose a mediator is to test for a direct effect of the independent variable on the dependent variable if the potential mediating variable is removed from the model (Baron & Kenny, 1986; Hair et al., 2014). This first requirement is questioned by Zhao et al. (2010). With process management excluded from the research model, the independent variable of process standardization exhibits significant positive effects of process standardization on MA performance (see Figure 7 and Table 7 in appendix). The significant direct effect of process standardization on MA performance is absorbed once the mediator is included in the model. Without the second potential mediator, MA performance, the relationship between process management and the perceived competitive advantage is not significant (see Figure 8 and Table 8 in the appendix of this article). The second requirement to identify a mediator is the existence of a significant indirect effect, when the assumed mediator is included in the model. This is the requirement focused on by Zhao et al. (2010). As Table 6 and Figure 6 illustrate, both indirect effects are significant (H4: path coefficient of 0.160 and p-value of 0.008; H7: path coefficient of 0.175 and p-value of 0.033). Next, variance accounted for (VAF) scores are analyzed. The VAF provides information on the strength of the mediating effect. It is the share of the total effect

explained by the indirect effect. The VAF scores of the two indirect effects came in at 58% and 79%. With a VAF score of 58%, the process management variable has been shown to act as a partial mediator in the relationship between process standardization and MA performance (Hair et al., 2014). With a VAF of 79%, MA performance also positively mediates and explains the relationship between process management and the competitive advantage and is on the verge of being a full mediator. The findings confirmed the theoretical assumption that process standardization leads to effective process management, and that, through process management, standardization also drives performance in the MA function. The statistical results can further explain that process management in the MA function can contribute to a competitive advantage through more decision-useful information.

The two direct-effect hypotheses that do not hold can each be explained by a significant mediator. Correlation statistics in Table 5 support these results. Concerning the first mediating effect, the correlation coefficient between process standardization and MA performance is lower than the correlation coefficient between process standardization and the mediator of process management and also lower than the correlation coefficient between process management and MA performance. Likewise, concerning the second mediating effect, the correlation coefficient between process management and the competitive advantage is lower than the correlation of each of these variables with the mediator variable of MA performance. In summary, both dependent variables can be explained better by the indirect mediated effect than by the direct effect. Analyzing the results, I further found no evidence of an effect of firm size on any of the tested variables. Table 6 and Figure 6 present the results.

Dependent variables →		MA performance		Process management		Competitive advantage
Independent variables ↓	H	Path coefficient (t-statistic)	H	Path coefficient (t-statistic)	H	Path coefficient (t-statistic)
Direct effects						
Process standardization	H1	0.115 (0.92)	H2	0.391 (3.23)***		
Process management	H3	0.410 (3.76)***			H5	0.046 (0.26)
MA performance					H6	0.426 (3.10)***
Indirect effects						
Process standardization	H4	0.160 (2.65)***				
Process management					H7	0.175 (2.14)**
Total effects and VAF						
Process standardization		0.275 (2.16)**				
Process management						0.221 (1.48)†
VAF		58%				79%
R^2 for dependent variables		0.218**		0.153*		0.202**

†p<0.15, *p<0.10, **p<0.05, ***p<0.01 (all two-tailed), N=59
H = hypothesis, VAF = variance accounted for
Total effects reflect the sum of direct and indirect effects. They are displayed only for the assumed mediator paths

Table 6: Direct, indirect, and total effects, VAF, levels of significance, and R^2 scores

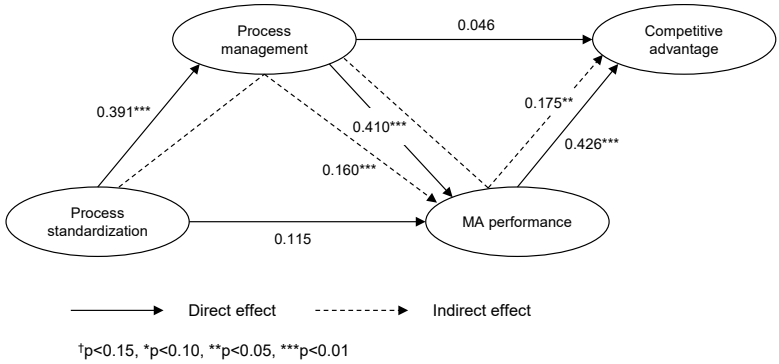

Figure 6: Inner model

2.5 Conclusion

2.5.1 Discussion and contribution

This study empirically tests a model I developed to test the positive effects associated with process standardization and process management. It makes three major contributions. First, this research adds to the positive outcomes that are generally associated with PO (see Kohlbacher, 2010) and establishes survey-based evidence on these effects in the MA function. Process standardization in the MA function has been shown to have an important and enabling effect. It enables companies to apply process management practices more effectively. Process standardization also indirectly improves the MA function' performance by enabling firms to apply process management practices. Thus, process standardization is not only relevant in more transactional accounting processes that are often shifted to shared service centers but also in the context of more knowledge-based activities such as MA. The study also provides evidence to the notion that changes in certain organizational variables (e.g., structural variables) are often not functional if not accompanied by changes in, for instance, control-related variables (Moores & Yuen, 2001). The finding that process standardization has an indirect positive effect through process management

exemplifies this notion and stresses the importance of sequences in the BPM life cycle (Houy et al., 2010).

A second contribution relates to BPM as a capability and a source of a competitive advantage. The study adds to Ray et al. (2004) and Porter (1991) who claim that resources per se are not a source of competitive advantages but the effective exploitation of resources through business processes. Adding to Hung (2006), who showed that process management enables firms to gain competitive advantages, and in line with claims by Manrodt & Vitasek (2004), this study provides evidence on BPM as a capability and source of a competitive advantage through the achievement of higher-quality information in the MA function. Addressing the scarcity of survey-based evidence that links BPM with competitive advantages (Nadarajah et al., 2014), this study provides survey-based evidence on the impact of BPM on the perceived ability to exploit competitive advantages.

A third contribution relates to effective MA practices in companies as direct sources of competitive advantages. Granlund and Lukka (1998a) highlight the importance and effectiveness of MA systems. While they argue that firms do not intend to gain a competitive advantage by their use, this study shows that MA functions that apply BPM principles can produce more relevant and more decision-useful information. Thereby, as this study further shows, companies can achieve competitive advantages.

As a final contribution to corporate practice, the results can show that process standardization and BPM lead to significantly higher MA performance. This is a noteworthy finding for corporate practice, where the emergence of different process standards specifically for the MA function can be observed.

2.5.2 Limitations

While a low number of respondents is considered an issue in conventional regression analysis, PLS-SEM has been designed to accommodate low-number datasets with higher statistical power (Hair et al., 2014). Although most path coefficients in the tested research model show high values and levels of significance, parameter estimates might be more stable and more significant with a higher sample size (Marcoulides & Saunders, 2006; Wong, 2013). Self-reporting of satisfaction levels,

performance, and social desirability are always a concern in survey-based research (Holzbach, 1978). Further, single-item constructs may be perceived as a limitation. However, there is evidence that single-item satisfaction measures are neither less reliable nor less robust than multi-item constructs (Bergkvist & Rossiter, 2007; Wanous, Reichers, & Hudy, 1997). Also, the single-item measure used in the survey does not load on other constructs in the study. For practicability reasons and owing to questionnaire length restrictions, the research model could not include all dimensions of PO that are associated with positive outcomes.

2.5.3 Future research

Research models are typically highly specific and focus on a limited number of research topics. Out of the many dimensions that are associated with a PO in companies, the research model showed a positive impact of process standardization on process management and their direct and indirect influence on performance outcomes and the perceived competitive advantage. A dimension not addressed in this research model is the behavioral-related dimension of process culture (Kohlbacher, 2010; Reijers, 2006). The effect of a strong process-related culture in the MA function could be examined. Also, the BPM construct could be expanded including capability-related elements addressing the knowledge that is deemed relevant for effective BPM (Challagalla & Shervani, 1996; Lok, Hung, Walsh, Wang, & Crawford, 2005). With proof of effective sequences of BPM and process-related characteristics, future studies could focus on sequences or the effective interplay of further PO-related dimensions. This can provide guidance for companies on how to sequentially introduce or enhance the level of PO. Specifically addressing the MA function, the effectiveness of the use of recently established process standards for the MA context can be explored. Finally, looking further into the future, the effect of BPM on innovation capabilities in the face of increasing digitalization can be explored (vom Brocke & Schmiedel, 2014). MA functions need to be developed to make sense of growing piles of data so that they can use this knowledge in traditional or potentially altered MA processes. This would – first and foremost – call for the design and conceptualization of standardized processes that can then be managed through BPM.

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2.7 Appendix

The following statistics are helpful in the identification and assessment of potential mediating effects.

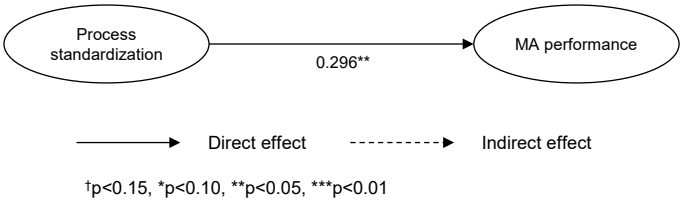


Figure 7: Inner model without the potential mediator of process management

Dependent variables □	MA performance
Independent variables □	Path coefficient (t-statistic)
Process standardization	0.296 (2.49)**
R^2 for dependent variables	0.088

†p<0.15, *p<0.10, **p<0.05, ***p<0.01 (all two-tailed), N=59

Table 7: Research model excluding potential mediator of process management

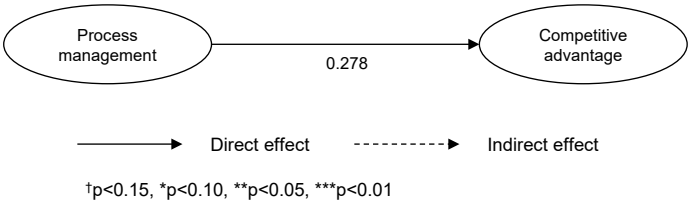


Figure 8: Inner research model without the potential mediator of MA performance

Dependent variables □	Competitive advantage
Independent variables □	Path coefficient (t-statistic)
Process management	0.278 (1.38)
R^2 for dependent variables	0.077

†p<0.15, *p<0.10, **p<0.05, ***p<0.01 (all two-tailed), N=59

Table 8: Research model excluding potential mediator of MA performance

3 Paper II: Effective accounting processes: The role of formal and informal controls

3.1 Introduction

Finance organizations have recently been undergoing substantial changes. Insourcing or outsourcing finance and accounting-related activities to shared service organizations or to external providers underscores that efficiency considerations are increasingly applied to the finance organization itself (Deloitte, 2011; Herbert & Seal, 2012). Yet, the new interest in the efficiency optimization of business and support processes revealed mixed satisfaction levels with cost reductions and service quality (e.g. Janssen & Joha, 2006). This hints at governance issues of supportive and transactional business processes related to management controls that empirical research does not clearly address (Christ, Mintchik, Chen, & Bierstaker, 2015). Given the scarcity of empirical findings on controls in transactional task environments and the finance organization in general, we centrally explore the effectiveness of formal and informal controls and their combinations in the accounting function. Among the different levels that management controls can be employed at, we look at controls that are enforced by operational management and are employed at the very employee level. As dependent variables we look at information quality and satisfaction with the cost level. These outcomes have been named as core fields of managerial interest in the face of efficiency optimizations (Zeynep, Aksin, & Masini, 2008). Of further interest is the effectiveness of informal controls that research seems to neglect compared to formal controls (De Jong, Bijlsma-Frankema, & Cardinal, 2014).

Among the processes most prominently highlighted in search of higher efficiency levels are accounting processes (Herbert & Seal, 2012). For such well-understood and often routinized processes, control theory prescribes applying formal governance structures as found in process and output controls (Jaworski, 1988; Ouchi & Maguire, 1975). This is so because knowledge about task sequences and the transformation process is high, and because work outputs can easily be measured (Modell, 1996; Ouchi & Maguire, 1975). Yet, the different accounting tasks are not only routinized, but also interrelated and people-intensive (Everaert, Sarens, &

Rommel, 2010). Nevertheless, current evidence on transactional contexts typically omits the control requirements of such social context and focuses on addressing the routinized characteristics through examining the impacts of formal controls. For example, Auzair & Langfield-Smith (2005) find that in transactional contexts, companies tend to rely on bureaucratic controls that resemble formal controls. However, they do not analyze the performance implications to see if that practice is effective. To address the social context within the accounting function, companies may choose to exert informal controls to complement the formal controls (see Dekker, 2004). Companies that exert informal controls can achieve better performance outcomes as research has shown in a variety of contexts and approaches (Jaworski, Stathakopoulos, & Krishnan, 1993; Ylinen & Gullkvist, 2014). The behavioral orientation as found in informal controls considers social processes that help organizations achieve their goals. A behavioral orientation has been argued to be beneficial even in professional service environments (Modell, 1996). In particular, Modell suggests to consider motivational aspects in service organizations to achieve goal coherence and norm alignment. In general, the author proposes that informal control mechanisms may complement formal types of control (Modell, 1996). This assumption regarding informal controls is in line with more recent notions that companies have to keep their workforces motivated and empowered, particularly in the area of routine-connoted and transactional accounting tasks (ACCA, 2002; Herbert, 2009). To achieve this motivation and goal coherence, a motivation and identification-inducing working environment as a form of an informal control can be instituted to induce and enforce norms and values. To test these assumptions, we employ the two informal control dimensions of working environment and peer pressure.

A positive working environment can be established to induce positive and fulfilling working environments (Chenhall, 2003). Modell (1996) has pointed out the usefulness of research on informal controls particularly in the context of business services. More recently, Malmi and Brown (2008) note on an abstract level that informal controls in the form of values and social normshave received little attention in empirical management control research compared to formal controls. Despite these findings as postulated by Malmi & Brown (2008), the effectiveness of informal

controls with regard to performance in the finance organization has not been shown yet.

Peer pressure is an informal mechanism for management to achieve norm conformity among employees (Cardinal, Sitkin, & Long, 2004) and to accelerate team effort (De Jong et al., 2014) through openly communicating the disapproval of undesired behavior (Druskat & Kayes, 2000). Yet, while the isolated application of peer pressure is undirected, peer pressure requires other controls that it seeks to enforce (De Jong et al., 2014). Analogous with research of De Jong et al. (2014) who find that peer pressure as an informal control mechanism is most effective if combined with other forms of control, we test the effectiveness of the combination of peer pressure with the formal controls that can be found in the accounting function.

This study examines effective combinations of formal and informal control mechanisms, to take up prior evidence that management controls are most effective in their combination (Anthony, 1952; Malmi & Brown, 2008). Accounting processes are increasingly subject to cost optimization efforts (Deloitte, 2011; Herbert & Seal, 2012), which aim to increase the satisfaction with the cost-level of these processes. Yet, mere cost optimization efforts in the accounting function may put companies at risk due to deteriorating financial statement accuracy (Christ et al., 2015). Therefore, cost-level satisfaction also has a quality component. Due to the transactional and standardized character of accounting processes, effective processes provide accurate information in a timely manner. We define this as information quality and argue that the effective combination of formal (output and process controls) and informal controls (working environment and peer pressure) facilitates cost-level satisfaction through the information quality resulting from the accounting processes.

The research model is tested in a cross-sectional survey setting among 59 senior-level finance and accounting managers in large companies across Germany, Austria, and Switzerland. We contribute in three dimensions to extant management control literature. First, we complement control theory (Modell, 1996; Ouchi & Maguire, 1975) by showing that not only formal controls but also informal controls, i.e. the working environment and peer pressure, drive performance in well-understood and routinized contexts, such as accounting processes. Second, examining the combinations of formal and informal controls adds significant insights to the analysis

of the mere isolated applications (Bedford, Malmi, & Sandelin, 2016). We contribute to prior research highlighting the usefulness of research on the combination between controls in general (Abernethy & Brownell, 1997; Malmi & Brown, 2008) and between formal and informal controls in particular (De Jong et al., 2014; Modell, 1996). Specifically, the combination of process controls and peer pressure yields positive effects on information quality (in line with De Jong et al., 2014). Third, we introduce 'cost-level satisfaction' as an outcome variable for routine-connoted and standardized processes that face efforts to increase cost efficiency. Because it is generally acknowledged that certain controls draw different amounts of resources (Merchant & Van der Stede, 2007; Widener, 2007), we introduce a cost-related performance variable to complement the mere quality considerations. For the accounting function, we show that the effective use of controls through information quality explains cost-level satisfaction. Lastly, we contribute to practice by showing that even well-understood activities like accounting tasks can be governed more effectively by inducing working environments that facilitate employees' identification.

The remainder of this paper is organized as follows: Section 2 reviews the literature. Section 3 provides information on the research design. Sections 4 and 5 present the results of the SEM and discuss them. Section 6 concludes the paper and considers limitations and future research directions.

3.2 Theoretical Development

3.2.1 Formal and informal controls in the context of accounting processes

Accounting tasks[2] typically comprise a specific set of tasks that are interrelated and thus dependent on each other (Everaert et al., 2010). Most accounting activities can be considered well-understood. They are jobs with a high share of transactional, i.e. frequent and repetitive, routine tasks. Routine jobs have a set of straightforward outputs, are typically standardized, and require little judgment by internal or external auditors (Everaert et al., 2010). Certain sequences of accounting processes can be selected, decoupled from the overall process, and shifted to other organizational units or to external service suppliers. Thus, these processes can be considered commodity services. Standardized processes allow coherence and systematic coordination that minimize errors and improve performance; standardization is a key requirement for positive accounting process outcomes (Davenport, 2005; Wüllenweber, Beimborn, Weitzel, & König, 2008). At the same time, a high level of interrelatedness, e.g. when processing financial information and subsequently preparing them for financial statements, make accounting processes also people-intensive (Brouthers & Brouthers, 2003; Everaert et al., 2010). The high reliance on people and their interactions gives accounting activities also a social context.

Hence, effective management control systems have to address the well-understood, technical processes in the accounting function but also its social context. We define management controls as all mechanisms and combinations of mechanisms that company management can employ to achieve organizational goals (Abernethy & Chua, 1996; Malmi & Brown, 2008). Central in this research project and in line with Merchant & Van der Stede (2007) is the notion that management controls explicitly address employee behavior.

Control theory uses different modes to classify management controls. The dichotomy of formal and informal controls is prominent (e.g., Cardinal et al., 2004; Smith, Carroll, & Ashford, 1995). This classification addresses both properties of

[2] The accounting function is responsible for processing and consolidating financial information. Financial statements are prepared at interim and year-end balance sheet dates (Everaert et al., 2010). Functionally, tasks within the accounting function include accounts payable and receivable, invoicing, payroll accounting, fixed asset accounting, and intangibles accounting, among others.

accounting processes; written formal controls prescribe behavior towards achieving organizational objectives while informal controls address the social context in the delivery of accounting tasks. We adopt the classification of formal and informal controls in the research setting, because all companies apply formal and informal controls to varying degrees (Langfield-Smith & Smith, 2003).

Formal controls

In line with Gencturk & Aulakh (1995), we define formal controls as written mechanisms that company management designs and establishes to induce behavior that leads to the achievement of organizational goals. Literature distinguishes between two forms of formal controls: process controls and output controls. They differ fundamentally in the timing of management intervention (Jaworski et al., 1993; Ouchi & Maguire, 1975). While process controls aim to monitor and influence the procedures during process delivery through process adherence, output controls focus directly on defining and monitoring intended outcome levels (Bello & Gilliland, 1997; Ouchi & Maguire, 1975).

For transactional business processes, control theory suggests to apply formal governance mechanisms for two reasons. Firstly, accounting activities are well-understood. Behavior during process delivery is sought to be influenced in order to achieve intended process outcomes (Bello & Gilliland, 1997; Ouchi, 1979; Ouchi & Maguire, 1975). Secondly, particularly for the transactional accounting tasks such as payroll accounting or payables and receivables processing, process outcomes can easily be measured. Therefore, output controls can also easily be instituted by management to define and measure process outcomes.

Informal controls

Like formal controls, informal controls are management mechanisms that steer employee behavior and ultimately help achieve organizational goals (Merchant & Van der Stede, 2007). However, informal controls mostly revolve around unwritten codes and mechanisms and are usually difficult to be designed explicitly (Jaworski, 1988; Langfield-Smith & Smith, 2003). Informal controls can take many forms. They have been shown to yield better performance outcomes in a variety of contexts and

approaches (e.g., Jaworski et al., 1993; Ylinen & Gullkvist, 2014) but are still not well understood (De Jong et al., 2014). They can be considered complements of formal controls (Modell, 1996). Informal controls are initiated by management and centrally rely on behavioral influences and not necessarily on contractual obligations (Smith et al., 1995). Among the different informal controls, management can rely on values, culture, or norms to achieve commitment among employees or to steer the orientation of employees (Daft & Macintosh, 1984; Ouchi, 1979). In this research context, we focus on a positive working environment and peer pressure.

Cultural controls as a key form of informal controls are the accumulated rituals and norms of interaction (Jaworski, 1988; Meyer & Rowan, 1977). They can take many forms and have not received meaningful research attention yet (Malmi & Brown, 2008). Their suitability for transactional processes is discussed ambiguously: On the one hand, they are associated less with transactional tasks and rather with non-routine work environments (Jaworski, 1988). On the other hand, more recent scholarly research and practitioner literature both posit that particularly in well-understood accounting environments informal mechanisms that induce high motivational levels are effective control mechanisms (ACCA, 2002; Herbert, 2009). As a form of control, management can evoke and influence certain circumstances in the work environment. Specifically, the work environment can create a place of identification for employees. Positive work environments seek to achieve goal congruence in a way that organizational and personal goals are aligned (Hall, Schneider, & Nygren, 1970). Through a positive working environment, management can further seek to create a feeling of pride among employees in their work (Buchanan, 1974).

Peer pressure is an approach of addressing and influencing behavior by openly communicating the non-compliance or disapproval of undesired behavior (Druskat & Kayes, 2000). While many controls seek to establish norms and standards, peer pressure is an informal mechanism that drives norm conformity and enforces standards (Cardinal et al., 2004; Feldman, 1984). Peer pressure has been analyzed by De Jong et al. (2014) in combination with norm intensity. They find that peer pressure drives teams' work effort if combined with norms or provisions. Thus, the effectiveness of peer pressure is contingent on the existence of norms and standards that can be enforced. Management or team members can initiate and exercise peer

pressure (De Jong et al., 2014). We adopt the concept of peer pressure in our model to reflect the element of open communication if undesired behavior in accounting processes is detected.

The two sub-dimensions of informal controls can be considered as opposing cultural mechanisms since a positive working environment is designed and enacted to motivate employees in a positive manner by fostering identification and belonging (Buchanan, 1974; Hall et al., 1970) while peer pressure seeks to apply pressure by openly expressing disapproval in case of non-compliance. Figure 9 displays the tested management controls in our research setting.

To understand the context of this research, three hierarchic layers in corporate accounting functions are considered. On an upper level, the accounting function is usually headed by an accounting head or a finance head that assumes the role of an accounting head. Below this top level of the accounting or finance head, there typically is a middle level of management with a specific responsibility within the accounting function, e.g., a head of consolidation, accounts payables, accounts receivables, inter-company transactions, or reporting. The third level that we consider in this research is the employee level. Employees are responsible to carry out specific tasks and are supervised by their respective second-level management. Those management controls that are subject of this research are in place to control and manage behavior on an employee level. The functional management within our second level is in charge of the enforcement of these controls. Finally, due to research-related considerations and as explained in the chapter dedicated to the research design, the questionnaire is answered by managers of the accounting or finance head level.

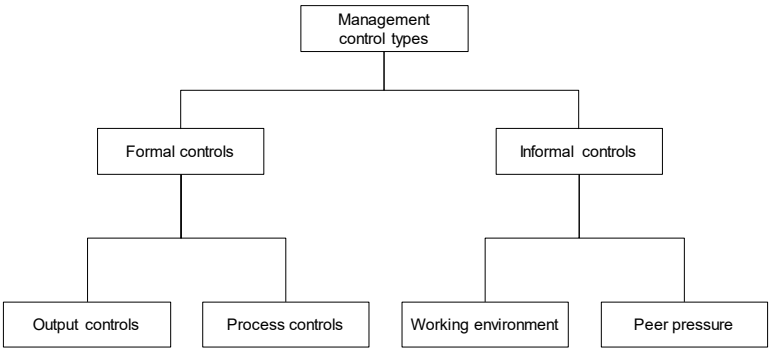


Figure 9: Overview of the tested management controls

3.2.2 Hypothesis development

The following section draws on the theoretical development and develops seven hypotheses of controls (or their combinations) facilitating information quality and cost-level satisfaction (see Figure 10). The subsequent hypotheses H1 to H6 motivate the control–information quality paths, while H7 deals with the information quality–cost-level satisfaction path.

Formal controls

Many accounting processes are routine-based tasks and are as such well understood by companies. They are among the most standardized processes within the finance organization. This is illustrated by the fact that sequences of accounting processes can be selected, decoupled from the overall process, and shifted to other organizational units or to external service suppliers. Therefore, accounting processes are placed most often in shared service centers (SSC) and are even outsourced to external service providers (Deloitte, 2011; Herbert & Seal, 2012). As there is well-grounded knowledge on the standardized sequences of accounting processes, control theory posits to apply formal governance structures as found in process and output controls (Bello & Gilliland, 1997; Ouchi, 1979; Ouchi & Maguire, 1975). Process controls monitor process adherence in order to influence and evoke desired behavior in the

process delivery and thus to achieve desired process outcomes (Bello & Gilliland, 1997; Ouchi, 1979; Ouchi & Maguire, 1975). Contractual precision, e.g., through formally documented process maps or in-process reporting requirements, ensures adherence to agreed-upon standards during process delivery (Christ et al., 2015). Due to the generally rather standardized character of accounting processes, we argue that enforcing process controls leads to an increased information quality provided. Output controls are used when process outputs can be measured, in order to reduce target deviations and strive for goal achievement (Ouchi, 1979). Measurable results characterize accounting processes: Accounting shared service centers strongly rely on service-level agreements (Zeynep, Aksin & Masini, 2008). For example, performance metrics regarding reaction times, transaction volumes processed per time unit, or error rates in transactions can be defined and specified with concrete target values. This way, performance in the accounting function can be measured using different performance dimensions of accounting processes. Supported by the measurable character of accounting process outcomes and the fact that output controls improve job performance (Jaworski et al., 1993), we argue that a high use of output controls leads to increased information quality.

H1: Process controls lead to higher information quality of accounting processes.

H2: Output controls lead to higher information quality of accounting processes.

Peer pressure and its combinations with formal controls

Peer pressure is an informal mechanism of addressing and influencing behavior characterized by openly communicating the disapproval of undesired behavior (Druskat & Kayes, 2000). By applying peer pressure that enforces standards and provisions through open feedback, management seeks to improve norm conformity and ultimately productivity (Cardinal et al., 2004; Feldman, 1984; Kennedy & Widener, 2008). Thus, peer pressure represents a form of feedback culture. Rosen, Levy, & Hall (2006) show that feedback culture in many forms can have a positive effect on job performance. In the standardized context of accounting processes, we argue that process conformity facilitates information quality. Yet, peer pressure

requires standards and provisions it strives to enforce. Without these formal guidelines, peer pressure is exercised in an undirected manner. Comparably, De Jong et al. (2014) show that peer pressure is most effective if combined with other forms of control. In their study, the authors provide evidence that the interaction effect exceeds the effects of both stand-alone constituents. Therefore, we argue that peer pressure is only effective if applied in combination with other forms of controls. Predominant forms of controls in the accounting function are formal controls, namely process controls and output controls. Therefore, we posit that peer pressure alone does not have an effect on information quality. Further, we formally hypothesize that the combinations of peer pressure with process controls and with output controls lead to better information quality of accounting processes.

H3: Peer pressure does not have an isolated effect on information quality of accounting processes.

H4: The combination of peer pressure and process controls has a positive effect on the information quality of accounting processes.

H5: The combination of peer pressure and output controls has a positive effect on the information quality of accounting processes.

A positive working environment and its combination with formal controls

Recent research and practitioner literature both posit that particularly in transactional accounting environments informal mechanisms inducing high motivational levels are of importance (ACCA, 2002; Herbert, 2009). A positive working environment is induced to drive identification and empowerment among employees. These working environments seek goal congruence so that organizational and personal goals are aligned (Hall et al., 1970). Moreover, management intends to make employees feel pride in their work (Buchanan, 1974) and to motivate them to work in the predetermined direction. An identification-inducing working environment has been shown to be a significant driver of job satisfaction (Jaworski et al., 1993), which itself is a determinant of job performance (Judge, Thoresen, Bono, & Patton, 2001).

Therefore, we hypothesize that positive, identification-inducing working environments lead to better performance that manifests itself through higher information quality of accounting processes. Unlike peer pressure that can be considered an enforcement mechanism to other forms of controls, the application of cultural controls in the form of positive working environments is unrelated to formal controls and can, thus, be exerted regardless of the formal control setup. We have no reason to believe that a combined employment of positive working environments and either process or output controls would yield additional effects that would materialize on top of the stand-alone effects of the controls. Therefore, we do not form specific hypotheses on the combination of working environment and formal controls.

H6: A positive working environment leads to higher information quality in accounting processes.

In functions facing tight cost-cutting considerations information quality is not the only performance outcome. Cost levels have been named another relevant performance outcome for managers in the context of business services (Zeynep, Aksin & Masini, 2008). If the achieved information quality comes at excessive extra efforts, this opposes the companies' efficiency intentions. Therefore, we argue that performance is not about the absolute cost level, but rather about the perceived cost appropriateness. We label this implicit cost-quality ratio cost-level satisfaction. It depends on the quality of accounting process outcomes in relation to their perceived cost level. We argue that information quality acts as a determinant of cost-level satisfaction. At constant costs, the better the data generated from the accounting processes, the higher the satisfaction with the accounting process. This is because lower information quality in accounting processes naturally relates to mistakes in processing and consolidating financial information and preparing financial statements. Mistakes in financial accounting pose considerable risks to companies that can be held accountable for wrongly stated financial statements (Christ et al., 2015). At the same time, obtaining an optimal information quality requires effective controls that all draw resources. (Jaworski, 1988; Merchant & Van der Stede, 2007; Widener, 2007). In summary, we argue that the 'positive effect' of information quality driving

satisfaction outweighs the 'negative effect' of generating additional costs. Therefore, we posit that information quality drives cost-level satisfaction. In sum, controls that directly improve information quality, indirectly improve satisfaction with the cost level.

H7: High information quality leads to higher satisfaction with the cost level of accounting processes.

The described hypotheses translate into the following research model as depicted in Figure 10. The model tests how controls and control combinations explain information quality in the accounting function. It also explains, how the satisfaction with the cost level is directly explained by information quality, and indirectly explained and mediated by management controls through information quality although no indirect paths are displayed. For a significant indirect effect, both paths in the mediator construct have to be significant. In other words, only management controls that have a significant effect on information quality can indirectly explain cost-level satisfaction.

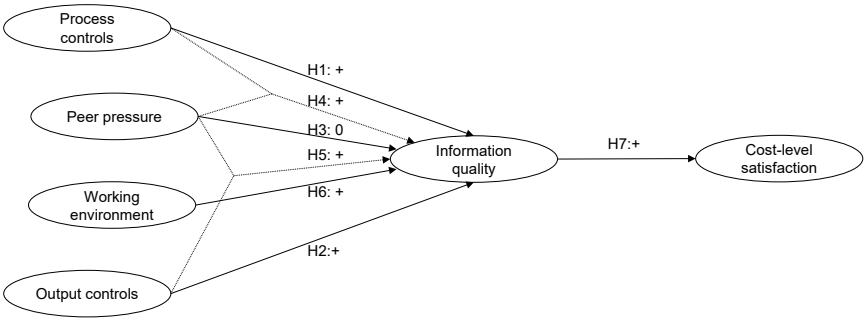


Figure 10: Research model

3.3 Research design

3.3.1 Data collection

Following the analysis of the literature, the research team conducted three interviews with corporate representatives of large German and Swiss companies that had a senior level position in a controlling or accounting-related field. This was to ensure that the research topics and models as identified through literature research also were of relevance to corporate practice. The interviews revealed different intensities of formal and informal governance approaches. This confirmed the assumption of a lack of knowledge about effective governance dimensions in corporate practice. Literature analysis and practical validation efforts were followed by the construction of the survey instruments. The survey was pre-tested and further developed in several steps. In a first step, finance executives and shared service managers (n=3) were given the chance to fill out the survey and were asked to comment on ambiguities or peculiarities that would make the questionnaire difficult to fill out as a practitioner. The resulting adaptations were integrated into the survey that in turn was inspected by researchers (n=5) for final scientific validation. Pre-test respondents were ultimately removed from the dataset before the start of the survey. A company list from Amadeus featuring the largest firms in the DACH region in terms of sales revenues was taken as a starting point and complemented with further companies. This methodology resulted in a sample size of 449 companies across the three countries. Relevant company representatives were approached through initial telephone requests and a subsequent invitation to the study by email. The survey took place via an online platform. The survey data was collected over a time span of six months. No differences in early and late answers have been detected regarding the analyzed variables (see Table 4). Among the participants that were approached, 59 participants ultimately completed the questionnaire. This translates into a response rate of 13%. The survey was distributed among finance and accounting executives but also shared service managers if the companies pursued a shared service delivery approach for their accounting processes. The survey included topics on a variety of tasks and processes in the finance organization. Hence, representatives had to be executives or at least senior managers in either accounting, controlling, or a finance-related field so that one can assume adequate knowledge on activities in the finance

organization. The condition regarding seniority has cost the survey a higher participation rate. Some targeted respondents indicated they were unable to answer questions on the finance organization in general or were not familiar with other processes than their field of activities. Regarding the geographic reach, the survey targeted companies from Germany, Austria and Switzerland. About two thirds of completed questionnaires came from Swiss companies. The average number of employees of participating companies is 19,700 with mean annual sales revenues coming in at 5.9 billion euros. With about a quarter of our sample, the largest body of participating companies belongs to the sector of industrials according to Reuters company classification. Regarding the position of respondents, a quarter of participants indicated to be the CFO of their company.

3.3.2 Measures

Most measures of this survey have been taken and adapted from the established literature while others have been developed to ask for specific peculiarities of controls in the finance organization. Following Ouchi & Maguire (1975), this study examines process and output controls within the formal dimension of controls. For the informal control dimension, two sub-dimensions are specifically adopted in the research models. Outcome measures comprise cost-level satisfaction and information quality. The next section contains a more comprehensive overview of the used items and scales.

Antecedents

Formal controls are operationalized using process controls and output controls. To test for process controls, four items reflecting different modes of setting and monitoring procedures are employed (Jaworski et al., 1993, p. 68). Respondents are asked to indicate on a 5-point Likert scale from 1 strongly disagree to 5 strongly agree whether (i) it is monitored to which extent established procedures are followed, whether (ii) procedures that are used to accomplish tasks are constantly evaluated, whether (iii) procedures are modified when desired results are not obtained, and, finally, whether (iv) the user organization provides constant feedback to the service organization/department on how performance goals are accomplished.

Output controls are measured using a self-developed 5-item scale on the institutionalization and tracking of service levels regarding six different dimensions. Specifically, the scale asks respondents to what extent different output dimensions are tracked by management. The different topics reflect insights gained in literature research and qualitative interviews with accounting or finance senior managers that preceded the survey. Respondents are asked to indicate on a 5-point scale from 1 not tracked at all to 5 fully tracked whether service levels are tracked by management regarding (i) actual costs vs. budget, (ii) volume of transactions processed per time unit, (iii) error rates in total transactions, (iv) reaction times for transaction requests, and (v) satisfactions levels of the information user.

Informal controls are tested relying on the two sub-dimensions working environment and peer pressure. The working environment measure seeks to capture whether (i) the working atmosphere encourages employees carrying out tasks and services to feel a part of the organization or whether (ii) the working atmosphere encourages employees carrying out tasks to feel a sense of pride in their work (Jaworski et al., 1993, p. 68). The sub-construct of peer pressure is also taken and adapted from prior literature (De Jong et al., 2014, p. 1718). It comprises four items that ask respondents to indicate whether (i) dissatisfaction is expressed openly if accounting processes are performed inappropriately, whether (ii) the service provider of accounting activities is confronted directly if processes are carried out unprofessionally, whether (iii) the company makes sure to let accounting service providers know if they do something that is considered unacceptable, and whether (iv) the company does not hesitate to tell the accounting service provider to shape up if processes are not performed to the satisfaction of the performance expectations. On a 5-point-Likert scale, respondents were asked to indicate from 1 strongly disagree to 5 strongly agree how far they agreed with the given statements for both sub-categories.

Outcome variables

Information quality of accounting activities was measured using different dimensions that were taken and adapted from the literature. The dimensions were related to the timeliness, relevance, and reliability of information. With regard to the timeliness of information, respondents are asked to indicate on a scale from 1 strongly disagree to

5 strongly agree whether (i) requested information arrives immediately upon request (Bouwens & Abernethy, 2000). Related to the relevance of information, the questionnaire asked respondents on the same scale whether (ii) provided information is relevant for the company, and whether (iii) accounting information provided is useful to the work of its destined users (Artz, Homburg, & Rajab, 2012, p. 458; Lee, Strong, Kahn, & Wang, 2002, p. 144). To test for information reliability, respondents were asked on a scale from 1 strongly disagree to 5 strongly agree whether (iv) information produced in accounting activities represents what it purports to represent (Artz et al., 2012).

The outcome variable cost-level satisfaction was asked using a reversed single-item question. Respondents were asked to indicate from 1 strongly disagree to 5 strongly agree with the statement of low a satisfaction with the cost level of accounting activities. To verify the respondents' capability of answering this ratio, we further asked about the difficulty of assessing the cost-quality ratio of accounting and controlling activities, from 1 very low to 5 very high. With a mean of 2.41, responses show that for accounting processes the assessment of the cost-quality ratio has not been deemed very difficult.

We created the constructs by taking the arithmetic mean of the single items. The combination of process controls and peer pressure was operationalized using a multiplicative approach. The amount of missing data was very limited (only 4 out of 1,180 answered items missing). We used the mean imputation approach to treat missing data items (Hair, Anderson, Tatham, & Black, 1998).

3.4 Analysis and results

3.4.1 Model specification

For the analysis of the research model, the partial least squares path modeling method to structural equation modeling (PLS SEM) is employed using SmartPLS 3.2.6 software (Ringle, Wende, & Becker, 2015). In typical PLS methodology, we analyze the overall model, the outer model, and the inner model. The outer model deals with the relationship between latent constructs and the indicators that they contain, whereas the inner model explains the relationships between the latent constructs (Chin &

Newsted, 1999). The research model consists of reflective indicators that can be considered manifestations of their latent constructs. In consequence, relationships between latent constructs are considered causalities (Chin, 1998). Besides reflective multi-item constructs, the research model also includes one single-item construct. PLS SEM has been designed to accommodate single-item measures (Hair, Hult, Ringle, & Sarstedt, 2014).

3.4.2 Outer model

This section deals with the analysis of indicator reliability, internal consistency, the convergent validity, and the discriminant validity of the constructs used in the research model (Hair et al., 2014; Henseler, Ringle, & Sinkovics, 2009).

Indicator reliabilities: Outer loadings must be greater than 0.7 (Hair et al., 2014) or 0.6 (Birkinshaw, Morrison, Hulland, & Wiley, 1995). However, if loadings come in between 0.4 and 0.7 it should be assessed individually whether indicators are removed or not (Hair et al., 2014). Table 9 shows descriptive statistics, loadings of items on their respective constructs, and cross-loadings of items on other constructs. With the exception of the item information quality 1, all items show sufficient loadings. As proposed by Hair et al. (Hair et al., 2014), we keep information quality 1 that asks for the timeliness of accounting information to ensure content validity. This is to provide a more comprehensive view of accounting performance in our information quality construct.

Internal consistency: Composite reliabilities should be above 0.7 (Hair et al., 2014). All composite reliabilities show values higher than 0.84 and thus meet internal consistency requirements (see Table 10). Hair et al. (2014) state that in PLS SEM research, composite reliabilities are better indicators of internal consistency than Cronbach Alphas.

Convergent validity: Average variance extracted (AVE) should be higher than 0.5 (Bagozzi & Yi, 1998). AVE values of multi-item constructs are 0.57 and higher (see Table 10). In consequence, constructs show sufficient convergent validity.

A sufficient discriminant validity signals a minimum level if distinction between constructs. Literature offers two options to ensure sufficient discriminant validity (Hair et al., 2014). First, all loadings of single indicators should be higher on their respective constructs than their cross-loadings on other constructs. This criterion is met in our research model (see Table 9). The second way to prove sufficient discriminant validity is the Fornell-Larcker criterion. The Fornell-Larcker criterion requires that the square root of AVE values of each construct must be higher than the correlations of the construct with the remaining constructs (Fornell & Larcker, 1981). The Fornell-Larcker criterion is met for all constructs (see Table 10).

						Cross-loadings					
		Min	Max	Mean	S.D.	(1)	(2)	(3)	(4)	(5)	(6)
(1)	Information quality 1	1	5	3.58	1.01	**0.56**	0.43	0.12	0.20	0.33	0.23
	Information quality 2	1	5	3.98	0.93	**0.77**	0.36	0.28	0.27	0.23	0.34
	Information quality 3	1	5	3.83	0.85	**0.84**	0.52	0.31	0.15	0.43	0.35
	Information quality 4	1	5	3.90	0.90	**0.85**	0.37	0.19	0.18	0.50	0.34
(2)	Process control 1	1	5	3.83	0.96	0.36	**0.64**	0.21	0.09	0.16	0.23
	Process control 2	1	5	3.50	0.94	0.36	**0.81**	0.34	0.25	0.29	0.24
	Process control 3	1	5	3.88	0.98	0.45	**0.81**	0.08	0.24	0.40	0.21
	Process control 4	1	5	3.31	1.00	0.46	**0.74**	0.43	0.18	0.29	0.22
(3)	Output control 1	1	5	3.63	1.12	0.28	0.30	**0.67**	0.12	0.13	0.13
	Output control 2	1	5	2.71	1.14	0.11	0.07	**0.69**	0.01	0.22	0.09
	Output control 3	1	5	2.69	1.27	0.24	0.28	**0.87**	0.12	0.15	0.14
	Output control 4	1	5	2.85	1.31	0.26	0.27	**0.86**	0.30	0.25	0.21
	Output control 5	1	5	2.83	1.15	0.18	0.34	**0.77**	0.09	0.18	0.12
(4)	Peer pressure 1	1	5	3.64	0.90	0.07	0.15	0.25	**0.76**	0.19	0.07
	Peer pressure 2	1	5	3.83	0.83	0.14	0.30	0.21	**0.86**	0.27	0.19
	Peer pressure 3	2	5	3.97	0.82	0.33	0.23	0.13	**0.95**	0.29	0.26
	Peer pressure 4	2	5	3.92	0.74	0.07	0.15	0.17	**0.77**	0.21	0.04
(5)	Working environment 1	2	5	3.85	0.92	0.42	0.32	0.17	0.17	**0.92**	0.20
	Working environment 2	2	5	3.58	0.94	0.49	0.39	0.26	0.34	**0.94**	0.34
(6)	Cost-level satisfaction	1	5	3.39	1.09	0.41	0.29	0.19	0.22	0.30	**1.00**

Cross loading values are taken from the analysis of Model C (see Table 11).

Table 9: Descriptive Statistics, loadings, cross-loadings

					Correlations and SQRT of AVEs (n=59)					
	Mean	S. D.	CR	AVE	(1)	(2)	(3)	(4)	(5)	(6)
(1) Information quality	3.82	0.70	0.85	0.59	**(0.77)**					
(2) Process controls	3.63	0.73	0.84	0.57	0.55	**(0.75)**				
(3) Output controls	2.94	0.94	0.88	0.60	0.30	0.35	**(0.78)**			
(4) Peer pressure	3.84	0.72	0.90	0.70	0.25	0.25	0.19	**(0.84)**		
(5) Working environment	3.71	0.87	0.93	0.86	0.50	0.39	0.23	0.30	**(0.93)**	
(6) Cost-level satisfaction	3.39	1.09	1.00	1.00	0.41	0.29	0.19	0.22	0.30	**(1.00)**

SQRT = Square root, S.D. = Standard deviation, CR = Composite reliability, AVE = Average variance extracted
Number in parentheses reflect square roots of AVE values. CR and AVE values rely on Model C (see Table 11).

Table 10: Descriptive statistics, correlations, convergent validity, and discriminant validity

3.4.2 Inner model

We use bootstrapping methodology with 5,000 iterations to test the significance of direct and indirect paths of the inner model of the PLS SEM. Out of the different hypotheses, only two hypotheses had to be rejected (see Figure 11). Table 11 presents path coefficients and significance levels resulting from the applied bootstrapping procedure. We included different deviations of our research model. Model A tests the direct effects of controls and control combinations on cost-level satisfaction with the potential mediator of information quality removed from the model. Model B examines only the stand-alone effects of management controls. The model does not consider control combinations. Model C additionally includes the possible effects of control combinations between formal and informal controls on information quality. Model D includes effects of controls and control combinations on both information quality and cost-level satisfaction. As more paths lead to the variable of cost-level satisfaction, R^2 scores are higher for this variable in Model D. However, because this way control combinations are used to explain two variables at the same time, path coefficients and levels of significance generally appear slightly lower than in Model C. Therefore, Model C is taken as a reference for results and discussions that primarily focus on the explanatory power of controls on information quality. The graphical illustrations of the research model as depicted in Figures 10 and 11 show the paths that represent the formulated hypotheses only but rely on calculated path coefficients as established by Model C. Generally, path coefficients are slightly lower the more paths are included in the different research models. However, despite lower scores for path coefficients and levels of significance, the different research models in Table 11 provide a fairly consistent picture about what paths are significant in the tested research context. Overall, only hypotheses related to output controls do not come in as expected.

Hypotheses 1 posits that process controls lead to a higher level of information quality. Results indicate a significant effect (β of 0.301, p-value of 0.011). The mediating effect between process controls and cost-level satisfaction through information quality is also significant (β of 0.124, p-value of 0.065). Hence, hypothesis 1 was not rejected.

Hypothesis 2 proposes that output controls lead to higher information quality with accounting processes. Our data does not indicate a significant effect (β of 0.140, p-value of 0.237). For this reason, hypothesis 2 was rejected. As a result, output controls cannot have an indirect effect on the satisfaction with the cost level either.

Hypothesis 3 suggests that peer pressure would not have an effect on information quality. Results do not provide evidence of a significant direct effect of peer pressure on information quality (β of 0.096, p-value of 0.569). Therefore, hypothesis 3 was not rejected.

Hypothesis 4 develops that the combination of peer pressure and process controls has a positive effect on information quality. Results show a significant effect (β of 0.327, p-value of 0.040). Hence, hypothesis 4 was not rejected. The combination of process controls and peer pressure also has a significant indirect effect on cost-level satisfaction mediated by information quality (β of 0.135, p-value of 0.077).

Hypothesis 5 proposes that the combination of peer pressure and output controls has a positive effect on information quality. Against our argumentation, this effect comes in insignificant (β of -0.171, p-value of 0.312). Accordingly, hypothesis 5 was rejected.

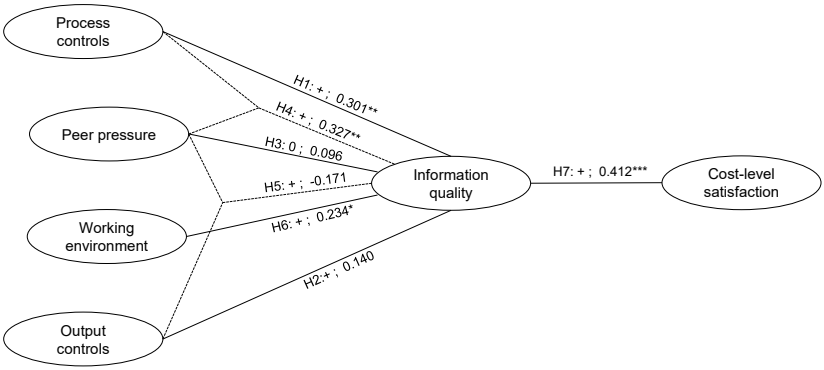
Hypothesis 6 posits a positive effect of the working environment on information quality. With a significant effect (β of 0.234, p-value of 0.053), hypothesis 6 was not rejected. A positive working environment also indirectly has an impact on the satisfaction with the cost level to a significant extent (β of 0.096, p-value of 0.115).

Finally, hypothesis 7 suggests that information quality leads to a higher satisfaction with the cost level. With a significant path coefficient (β of 0.412, p-value of 0.001) hypothesis 7 was not rejected. Because of this significant path between information quality and cost-level satisfaction significant effects between management controls and information quality can also have significant indirect effects on cost-level satisfaction.

To classify the indicated indirect effects, mediator-identification methodology mandates testing for the direct effects between independent and dependent variables. During this process step, the mediating variable has to be removed from the model (Baron & Kenny, 1986; Hair et al., 2014). According to Zhao et al. (2010), no direct effect is required to be mediated. Still, in Model A in Table 11 we show the

coefficients for all paths with information quality, the potential mediator, being removed from the model. The results show that there are no significant direct effects of controls on the satisfaction with the cost level. Models B, C, and partially Model D provide evidence of three significant indirect effects for process controls, the combination of process controls and peer pressure, and the working environment on cost-level satisfaction. Model A shows that, without the mediator in the model, the direct effects of these controls and control combinations on cost-level satisfaction are insignificant. In the words of Zhao et al. (2010) the shown indirect effects are classified indirect-only mediating effects.

As a further notable observation, R^2 values with regard to information quality rise when including control combinations. Further noteworthy, results indicate that there are no differences regarding the performance variables of information quality and cost-level satisfaction depending on whether companies employed accounting shared service centers or not. However, peer pressure in the accounting function is applied to a higher degree in those companies that employ accounting shared service centers. Also a positive working environment is applied in different intensities depending on the use of shared service centers. If accounting shared service centers are in place, a positive working environment, although shown to be effective, is employed to a lesser extent (see Table 12). Figure 11 displays path coefficients and p-values of the research model. Statistical results for the research model as shown in Figure 11 were taken from the results for Model C.



†p<0.15, *p<0.10, **p<0.05, ***p<0.01 (all two-tailed), N=59; Statistics are based on Table 11, Model C.

Figure 11: Research model C with statistical results

Model →		A	B	C	D
Path ↓	Hyp. Effect	Path coefficient (t-stat.) Mediator of information quality removed	Path coefficient (t-stat.) Only stand-alone effects	Path coefficient (t-stat.) All direct effects on information quality	Path coefficient (t-stat.) All effects, direct and indirect
Direct effects					
Process controls → Information quality	H1: +		0.436 (4.026)***	0.301 (2.521)**	0.301 (2.534)**
Output controls → Information quality	H2: +		0.080 (0.758)	0.140 (1.175)	0.139 (1.115)
Working environment → Information quality	H6: +		0.314 (2.866)***	0.234 (1.908)*	0.237 (1.908)*
Peer pressure → Information quality	H3: 0		0.046 (0.266)	0.096 (0.564)	0.089 (0.555)
Process controls → cost-level satisfaction		0.185 (1.240)			0.057 (0.371)
Output controls → cost-level satisfaction		0.012 (0.068)			0.038 (0.245)
Working environment → cost-level satisfaction		0.202 (1.222)			0.087 (0.561)
Peer pressure → cost-level satisfaction		0.117 (0.659)			0.099 (0.666)
Process controls * peer pressure → Information quality	H4: +			0.327 (2.071)**	0.329 (2.146)**
Output controls * peer pressure → Information quality	H5: +			-0.171 (1.018)	-0.165 (1.016)
Process controls * working environment → Information quality				-0.151 (1.347)	-0.154 (1.287)
Output controls * working environment → Information quality				-0.016 (0.138)	-0.014 (0.119)
Process controls * peer pressure → cost-level satisfaction		-0.092 (0.616)			
Output controls * peer pressure → cost-level satisfaction		-0.062 (0.341)			
Process controls * working environment → cost-level satisfaction		0.015 (0.090)			
Output controls * working environment → cost-level satisfaction		0.139 (0.770)			
Information quality → Cost-level satisfaction	H7: +		0.412 (3.265)***	0.412 (3.253)***	0.302 (1.649)*

†p<0.15, *p<0.10, **p<0.05, ***p<0.01 (all two-tailed), N=59
H = hypothesis

Model →		A	B	C	D
Path ↓	Hyp. Effect	Path coefficient (t-stat.) Mediator of information quality removed	Path coefficient (t-stat.) Only stand-alone effects	Path coefficient (t-stat.) All direct effects on information quality	Path coefficient (t-stat.) All effects, direct and indirect
Indirect effects					
Process controls → cost-level satisfaction			0.160 (2.229)**	0.124 (1.833)*	0.091 (1.198)
Output controls → cost-level satisfaction			0.033 (0.715)	0.058 (1.063)	0.042 (0.871)
Working environment → cost-level satisfaction			0.130 (2.127)**	0.096 (1.561)†	0.072 (1.146)
Peer pressure → cost-level satisfaction			0.019 (0.254)	0.039 (0.521)	0.027 (0.432)
Process controls * peer pressure → cost-level satisfaction				0.135 (1.767)*	0.099 (1.504)†
Output controls * peer pressure → cost-level satisfaction				-0.070 (0.966)	-0.050 (0.851)
Process controls * working environment → cost-level satisfaction				-0.062 (1.168)	-0.046 (0.912)
Output controls * working environment → cost-level satisfaction				-0.007 (0.128)	-0.004 (0.097)
R^2 for dependent variables					
Information quality			0.405 (4.074)***	0.525 (5.091)***	0.524 (4.867)***
Cost-level satisfaction		0.176 (1.905)*	0.170 (1.626)†	0.170 (1.849)†	0.196 (1.822)*

†p<0.15, *p<0.10, **p<0.05, ***p<0.01 (all two-tailed), N=59
H = hypothesis

Table 11: Direct and indirect effects, VAF, levels of significance, and R^2 scores of research model variants

Construct	Early respondents (n=30)	Variance	Late respondents (n=29)	Variance	p-value
Process Controls	3.73	0.56	3.52	0.52	0.27
Output Controls	3.03	0.95	2.85	0.84	0.46
Peer Pressure	3.86	0.40	3.82	0.65	0.83
Working environment	3.85	0.55	3.57	0.96	0.22
Information Quality	3.88	0.41	3.77	0.58	0.56
Cost-Level Satisfaction	3.60	1.21	3.17	1.15	0.14
Construct	**SSC** (n =24)		**No SSC** (n =35)		
Process Controls	3.69	0.69	3.59	0.47	0.62
Output Controls	3.13	0.80	2.81	0.94	0.20
Peer Pressure	4.07*	0.34	3.68*	0.58	0.04
Working environment	3.44*	0.85	3.90*	0.63	0.04
Information Quality	3.70	0.62	3.91	0.40	0.26
Cost-Level Satisfaction	3.38	1.11	3.40	1.31	0.93

The sample was divided into early and late respondents based on the return period of the survey. This resulted in 30 early and 29 late respondents. Besides, out of the 59 participating companies, 24 indicated to employ a shared service center.
* Means are significantly different at p-value < 0.1 (two-tailed significance).
Given limited group sizes, results of mean comparisons should be interpreted cautiously.

Table 12: Subgroup analyses

3.5 Conclusion

3.5.1 Discussion and contribution

Research on different control types and their effects is vast. Yet, knowledge not only about their applicability but also their effectiveness and combinations is far from complete and needs to take into consideration the specific application contexts (Merchant & Van der Stede, 2007). With regard to the effectiveness of controls, the relevant literature has not accumulated much empirical evidence on appropriate control mechanisms in accounting processes. Motivated by the ambiguity in sourcing decisions and governance, Christ et al. (2015) have addressed this shortcoming and formulated hypotheses on the usefulness of formal controls in the context of routinized accounting processes. We contribute to management control literature on three dimensions.

First, complementing control theory that generally proposes applying formal controls for well-understood and routinized processes with measurable outcomes (Modell, 1996; Ouchi & Maguire, 1975), we broaden the scope and show that informal controls also have an impact on performance outcomes. While a positive working environment drives cost-level satisfaction through information quality as a stand-alone control, peer pressure does not exhibit a stand-alone direct or indirect effect but shows a significant effectiveness in combination with process controls. Our results on the different functionalities of peer pressure and the working environment help fill the knowledge gap that is associated with informal controls and the implications of their application (Malmi & Brown, 2008). Illustrating the role of informal controls is at the same time a core contribution to practitioners because we provide evidence of the previously unfounded hypothesis that mechanisms fostering motivation and identification, e.g., a positive working environment, are relevant in accounting processes (ACCA, 2002; Herbert, 2009). Still, our data shows that cultural controls in the form of a positive working environment, although effective, are applied significantly less in accounting shared service centers. While Modell (1996) argues that motivation-inducing controls are particularly effective in the absence of measurable results, we can show that they are nevertheless effective also in accounting processes that show a high measurability of outputs. Further, although accounting processes show high levels of performance measurability which is indicated by the

general use of service-level agreements, we find that output controls that focus on this ex-post monitoring of performance outcomes do not appear to have a significant effect on information quality. This contradicts traditional control theory (Ouchi, 1979). The mere existence of formalized service and quality levels does not seem to lead to improved quality levels. Ex-post interviews with participants revealed that often detailed service-level agreements are in place. By some participants they were referred to as gentlemen agreements that are in place. Yet, these service-level agreements are often not strictly enforced. Contrary to output controls, process controls have a positive stand-alone effect on performance. This is in line with prior theorizing encouraging process controls in the context of well-understood processes like accounting processes (Christ et al., 2015). In sum, we contribute to literature by making a first step to understanding the role of informal controls in well-understood and standardized processes such as accounting processes.

Second, we find significant interaction effects when combining formal and informal controls. This supports Bedford, Malmi, & Sandelin (2016) who posit that empirical evidence regarding the combination of controls as packages is necessary because insights into the isolated or stand-alone effects of controls could be fundamentally different from the use of controls in combination. Specifically, we find that peer pressure accentuates the indirect effect of process controls on information quality and cost-level satisfaction. Here, peer pressure enforces the adherence to formalized process routines and acts as an amplifier of process controls in their impact on information quality. This confirms De Jong et al. (2014), who can show the possibility of an effective combination of peer pressure and norms. Further, evidence indicates that the combined effects of formal controls and a positive working environment do not yield additional significant positive or negative effects. Therefore, the positive effect of a positive working environment that was found in the relationship with information quality holds true regardless of the instituted formal controls in companies. In sum, we contribute to the management control package literature by showing that control configurations consisting of both formal and informal control dimensions have different effects on information quality depending on the type of control.

Third, we introduce 'cost-level satisfaction' as an outcome variable for well-understood and standardized processes, such as accounting processes. In general, the institutionalization of control processes aims for increased information quality, which means that relevant and reliable information are provided in a timely manner. Yet, especially in environments with ambitious cost-cutting consideration, managers consider that inducing governance mechanisms costs resources (Merchant & Van der Stede, 2007; Widener, 2007). Therefore, we introduce a cost–quality ratio to complement the mere quality considerations (see Zeynep, Aksin & Masini, 2008). Cost-level satisfaction is central to assessing performance of standardized and rather easily transferable processes such as accounting processes. In sum, we contribute by introducing cost-level satisfaction as a performance variable and by demonstrating how controls facilitate satisfaction through information quality.

3.5.2 Limitations

As typical with empirical studies, this study has potential limitations. First, the rather small number of respondents (n=59) in the research setting limits generalizability. Levels of significance may rise with a simpler model, i.e. a more focused selection of independent variables. This can be seen in Table 11. The Table shows models that gradually include more variables. However, in consequence, levels of significance as well as the strengths of path coefficients are diluted. We have found a balance to this by relying on Model C but still show a Model D with more variables included. Second, a latent risk of cognitive bias in the responses, i.e. social desirability and self-reporting, may be perceived as a limitation (Holzbach, 1978). Third, despite controversial debates about the usefulness of single-item versus multi-item constructs, scholars have found that single-item measures related to satisfaction are no less robust or reliable than multi-item measures (Bergkvist & Rossiter, 2007; Wanous, Reichers, & Hudy, 1997). Therefore, we argue that the applied single-item measure for 'cost-level satisfaction' provides reliable results.

3.5.3 Future research

The study results provide guidance for future research. First, by having examined governance mechanisms in the accounting function – which is one part in the CFO task universe – we raise promising questions on appropriate control mechanisms for other activities in the finance organization. Given the different nature and context associated with controlling or management accounting processes, more detailed insights into useful control mechanisms for controlling tasks are helpful, both regarding formal and informal control dimensions (Christ et al., 2015). Specifically, when confronted with the results of our analysis, respondents indicated particular interest in further dimensions of informal governance that induce motivation and identification. Second, cost considerations have clearly reached the finance organization. Our models that include cost-level satisfaction as the dependent variable yield rather low R^2 scores, meaning that a considerable part of the variance of this dependent variable remains unexplained. This study provides a starting point. Research so far has not provided meaningful evidence on an efficient and effective use of controls. Information quality only partly explains the satisfaction with the cost level. As all management controls cost resources (Merchant & Van der Stede, 2007; Widener, 2007), cost-benefit considerations in control research seem underrepresented. More research examining controls and their combinations with regard to cost-level satisfaction seems promising. Third, our research has shown significant control combinations. Future research may explore organizational set-ups that enable formal and informal controls to effectively substitute and complement each other. In summary, research on the interplay of formal and informal controls should not be reduced to quality outcomes of processes or activities but should additionally include the cost-benefit perspective. In line with Merchant & Van der Stede (2007), we assume that a higher use of informal controls improves cost-quality perceptions, even more so when informal controls act as substitutes of formal controls.

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4 Paper III: Triggering Events in Asset Impairment Accounting

4.1 Introduction

A fundamental goal of financial reporting standards is to ensure the regular disclosure of assets according to their adequate values. An asset should be stated at no more than its recoverable amount, otherwise IAS 36 dictates the recognition of an impairment loss on the asset. The timely recognition of impairment losses, as imposed by IAS 36, reflects a common characteristic of IFRS standards and recent IAS standard updates to promote fair value accounting in financial reporting (Ball, 2006; Cairns, 2006). Conducting an impairment test for every asset on every balance sheet date is not intended by the standard setters, who instead require only monitoring for impairment indicators. While regularly screening for so-called triggering events, companies are only required to carry out impairment tests when they identify impairment indicators.[3] With goodwill, intangible assets with an indefinite life, and intangible assets that are not yet available for use there are exceptions to this principle. These mentioned assets have to be tested for impairment at least annually or if indicators for a possible impairment are present. While much research analyzes only the impairment test and is focused on technical matters such as appropriate discount rates or cost of capital rates as part of value-in-use calculations (e.g., Husmann & Schmidt, 2008; Kvaal, 2010; Petersen, Plenborg, & Scholer, 2006; Schauten, Stegink, & de Graaff, 2010), this paper takes a step back. Instead of contributing to the technical aspects of the impairment test, this paper elaborates on the preceding stage of the impairment test, answering the question when to conduct impairment tests at all. It establishes a framework of impairment indicators that reflect the very assumptions underlying asset valuations. A short-coming in the context of triggering events in IAS 36 is the lack of guidance on the estimation of different value drivers associated with asset valuations (Petersen & Plenborg, 2010). Triggering events as business performance measures represent value drivers that indicate the recoverability of assets values. In corporate

[3] The terms *triggering events* and *impairment indicators* are used interchangeably in this paper.

practice, however, only a small minority of companies indicates pursuing a structured approach in assessing the existence of triggering events (KPMG, 2011). Looking at the standards, both IAS 36 and its similar US counterpart SFAS 142/144 are vague and only list a limited number of examples to illustrate what can be considered a triggering event. IAS 36.13 clearly states that the list of indicators provided to define triggering events is not exhaustive. The purpose of this paper is not to question the principle-based characteristic of IFRS but to establish a systematic framework of impairment indicators in a case study setting to help companies better justify their asset valuation assumptions. It substantiates the scant guidelines by asset impairment standards, including goodwill impairment, that have been widely criticized (ESMA, 2013; Wersborg, Stork, Teuteberg, & Zülch, 2014).

Finding adequate indicators to assess the recoverability of asset values is beneficial for various reasons. First of all, it is relevant for different stakeholders of the finance function. It can enhance the quality of discussions on the recoverability of asset values between accountants and auditors. While accountants need guidance on what can be considered adequate impairment indicators to help them in valuation-specific decision-making, auditors are particularly interested in the assumptions underlying their clients' asset valuations. Unsurprisingly, assumptions on fair value measurements in the context of asset impairments have been identified as a key subject in discussions between management and audit partners (Cannon & Bedard, 2016). Auditors and enforcement authorities stress the limited usefulness of financial reports for their readers concerning asset impairments. In a particular dilemma in this context are auditors who have to assure fairly stated asset values in the face of a proliferation of subjective valuation models (Christensen, Glover, & Wood, 2012). The lack of specificity in standards has often lead to boilerplate impairment-related disclosures by companies or even opportunistic reporting (ESMA, 2013; Riedl, 2004). Research shows that impairment write-offs may be unspecific or delayed as managers are left with too much accounting discretion (Glaum, Landsman, & Wyrwa, 2015; Henning, Shaw, & Stock, 2004; Hayn & Hughes, 2006).[4] Scholars have found

[4] Avallone & Quagli (2015) name expected cash flows, their assumed future growth rates and applied discount rates as variables in value-in-use calculations that are particularly subject to managerial discretion.

evidence that managers may use their discretion in the impairment context of assets in the face of certain incentive structures (Beatty & Weber, 2006; Guler, 2007). A framework will thus help corporate managers in discussions with auditors on valuation assumptions and, if properly disclosed, will also help investors and other users of financial reports.

As stated, the institutionalization of a formal framework of triggering events can enhance the quality of interaction among relevant stakeholders of the finance function but serves also other purposes. Triggering events are of particular relevance in interim financial reporting. Intangible assets with an indefinite useful life or goodwill both have to be tested for impairment not only annually but also at interim balance sheet dates in the presence of indicators. Triggering events are particularly important in the case of goodwill, as its value depends on assumptions on future management actions, for instance, and is difficult to verify and audit (Ramanna & Watts, 2012; Watts, 2003).

A systematic screening framework is particularly helpful for companies that carry out impairment tests at every balance sheet date. Instead of calculating recoverability values for all assets or cash-generating units (CGUs), even at interim dates, a systematic screening for potential impairment indicators saves unnecessary and cumbersome valuations because they will only follow in the presence of indicators. Especially in complex organizations, we argue that a trigger-based systems monitoring approach promises to be beneficial for two reasons. A formalized and documented framework on value drivers and key business metrics can not only save time and resources but also serves as a regular risk assessment tool for corporate centers. Impairment indicators often are key assumptions in technical asset valuations. Their presence may trigger an impairment test but not necessarily an ultimate write-off. Systematic knowledge on triggering events with their early-warning qualities will thus give companies informational advantages that the inputs of pure technical valuations cannot provide. A framework of identified triggering events can thus be seen as an early-warning instrument. It can be employed by corporate centers in their interactions with segmental or local management to systematically assess business risks. A regular screening process for potential business discontinuities can be part of the strategic planning process that requires regular monitoring for a timely

identification of strategic surprises. The timely identification of strategic signals can in turn facilitate adequate responses (Ansoff, 1976). The use of a full framework would also improve understanding of the business model and its value drivers.

Finally, corporate centers can use the framework quarterly or annually for accountability purposes, letting local managers report on the most recent segmental business developments.[5] It reflects the need of corporate centers to employ management controls in their interactions with decentralized management units to mitigate internal agency conflicts (Lhaopadchan, 2010). Using agency-theory rhetoric, corporate centers would incur monitoring costs by applying stricter management controls but would benefit from reduced information asymmetries (Jensen & Meckling, 1976). An institutionalization across the organization would entail certain one-time efforts but would result in the documentation of managerial assessments of business performance and business-specific value drivers. It would also strengthen internal controls that in turn may again help in collaborations with auditors (e.g., Cohen & Hanno, 2000).

With literature often employing simplified settings in their argumentation and disagreement among scholars, standard adopters are left with limited guidance. We argue that in such circumstances it is helpful to look at innovative solutions as implemented in practice. Looking at best-practice solutions is particularly helpful in management-related research contexts where actors must adapt to ambiguity and fast-changing environments. Given the absence of clear guidance and sufficient knowledge, qualitative case studies can provide useful evidence by shedding light on innovative accounting practices (Kaplan, 1986; Yin, 1984). Much research on IFRS tries to interpret the rules while neglecting to look at practical implementations (Ball, 2006). This paper employs an exploratory case study research design to show how a systematic impairment framework can be developed and implemented in a case setting in the automotive industry.

[5] IAS 36 dictates testing for the impairment of single assets or, if more appropriately, groups of assets that generate independent cash flows from each other as cash-generating units. IAS 36.130d exemplarily names product lines or plants as possible asset clusters or cash-generating units. A cash-generating unit is the smallest entity that generates independent cash flows and for goodwill allocation purposes may not be larger than business segments as articulated by IFRS 8.

The remainder of this paper is composed as follows. In the next section, we summarize information on triggering events, as given by accounting standards. We draw and outline similarities between IFRS and US GAAP concerning impairment accounting. We then explain the case study research design and elaborate on the framework – from the identification to the systematization of the triggering events. Finally, based on research findings, we discuss the use of the framework and the implications of its use.

4.2 Conceptual background

IAS 36 generally regulates the impairment of assets, although certain assets such as financial assets (IAS 39/IFRS 9) or inventories (IAS 2) are exempted from IAS 36 and are subject to specific regulations. Besides other exemptions, the standard also does not apply to noncurrent assets classified as held for sale, according to IFRS 5. Table 13 lists major assets within the scope of IAS 36 and the mode of depreciation and impairment for each listed asset class. In a recent study, Tsalavoutas, André, & Dionysiou (2014) find that plant and machinery are assets that are most often impaired. Also, impairment losses on intangibles with an indefinite useful life are more often recognized than goodwill impairment losses. In general, IAS 36 is considered complex and, despite its revision in 2004, also viewed as an article that is hard to comply with (Petersen & Plenborg, 2010). Empirical studies, for instance, reveal noncompliance and insufficient disclosure levels regarding goodwill impairments (Financial Reporting Enforcement Panel (FREP), 2011; ESMA, 2013; Glaum, Schmidt, Street, & Vogel, 2013).

Asset group	Mode of depreciation
Property, plant and equipment (IAS 16)	Assets valued under the cost model are carried at cost less depreciation and impairments
Cash-generating units (CGUs) as defined in IAS 36, including CGUs to which goodwill is allocated as defined in IFRS 3	Regular depreciation if applicable; CGUs tested for impairment in the presence of triggering events; CGUs with goodwill tested annually or in the presence of triggering events
Intangible assets (IAS 38)	Regular amortization if applicable; impairment test in the presence of triggering events; intangibles with an indefinite useful life tested annually or in the presence of indicators
Investment properties valued at cost (IAS 40)	Investment properties valued at cost are carried at cost less accumulated depreciation and less accumulated impairment losses, i.e. impairment tests occur in the presence of triggering events

Table 13: Major assets within the scope of IAS 36

IAS 36 generally only requires adopters to carry out an impairment test if indicators for a possible impairment are present. In contrast, the impairment test for goodwill must be carried out at least annually or if indicators for a possible impairment are observed. Hence, a systematic diagnosis tool for triggering events becomes particularly relevant in the preparation of interim financial reporting. In principle, a framework for potential impairments can be used for all noncurrent assets, including goodwill, if not subjected to specific regulations. Regarding the screening process for impairment indicators, a majority of companies assesses material events spontaneously as to whether they constitute a triggering event. The identification of triggering events does not follow a systematic procedure. Only a small minority of companies indicate to pursue a structured process in assessing the existence of triggering events (KPMG, 2011). Since the standard itself provides only exemplary help, a systematic and formalized procedure to review the recoverable amount of

assets helps eradicate the ambiguity and prevents management from assessing the valuation of assets spontaneously at their discretion. In turn, local managers following a formal process by documenting the most crucial assumptions will help auditors in their judgment of asset valuations because the diligence with which auditors, regulators or investors would otherwise have to comb through single lines of assets can be questioned (Ball, 2006).

So, what are the indicators that hint at deteriorating business environments and outlooks? According to reporting standards, a triggering event may occur in different forms. Besides dividends from subsidiaries, jointly controlled entities or associates, IAS 36.12 generally distinguishes between internal and external triggering events for the impairment of assets or business entities, but remains non-exhaustive. Internal indicators for a possible impairment comprise the obsolescence or physical damage of an asset, significant changes or expectations of changes regarding how the asset is used, and evidence for diminishing economic benefits from the asset (IAS 36.12e-g). External impairment indicators include market values falling more than expected and changes in the technological, market, economic or legal environment. Addressing input variables of value-in-use calculations, the standard mentions changes in interest rates or changes in market rate of returns as further external triggering events. A carrying amount higher than the market capitalization of an entity is another external impairment indicator (IAS 36.12a-d). Looking at US GAAP standards, the impairment of assets follows a similar procedure (Hitz, 2007), with SFAS 142 covering the impairment of goodwill and SFAS 144 regulating the impairment of long-lived assets. US GAAP equally employs the notion of screening for triggering events and carrying out an impairment test in the presence of indicators. Similar to IAS 36, goodwill and intangible assets with an indefinite useful life must be tested for impairment at least annually or if triggering events are observed. Despite showing certain technical and nontechnical differences, the modus operandi to carry out an impairment test reveals similarities to the IFRS procedure. Regarding the definition of impairment indicators, SFAS also name exemplary triggering events. According to SFAS 144.8a-f, these include a significant decrease in market prices, a change in the manner of how an asset is used, changes in the legal environment or business climate in general, acquisition or construction costs that are significantly higher than expected,

operating cash flow losses and predictions of consistent losses or the expectation that assets will be sold or disposed of otherwise. Although the recoverability of goodwill must be tested at least annually, SFAS 142.28a-g further list exemplary impairment indicators that, if perceived between the regular testing instances, induce an extraordinary impairment test. The entries largely correspond to the ones presented in SFAS 144.8, but also include new items. Among the new entries, the standard lists unexpected competition, the loss of key personnel, or a subsidiary recognizing an impairment loss as further exemplary impairment indicators. Even further triggering events could be a macroeconomic downturn in general, higher input costs, in general deviations of revenues and earnings from actuals or planned values (FASB, 2011). In total, the exemplary triggering events as mentioned by standard setters are not exhaustive but are helpful in giving implicit instructions for the establishment of a systematic monitoring framework for impairment indicators.

4.3 Research method

To elaborate a systematic framework, we bring together the different instructions by standard setters, findings from corporate reports and classify them in order to establish a systematic framework structure. Since collecting only evidence in accounting standards or in the notes of financial reports will not yield a complete framework, this study also examines practical requirements and insights from a real case company. This is to complement these research findings with triggering events as identified by the case company.

The case company is an automotive supplier with global operations based in Germany. As a non-listed company, it has exercised its option to apply IFRS financial reporting standards. The selection of a case research setting must not be done arbitrarily but should represent a suitable and innovative sample for a specific research problem (Kaplan, 1986; Ahrens & Chapman, 2006). The company selected for this research purpose resembles a suitable case company for various reasons. For one, the automotive industry as a crucial economic element in many countries shows high levels of revenues and can be considered a highly competitive industry with companies having to manage complex operations. The case company itself generates several euro billions of annual sales revenues across many business units (BUs) and

has pursued a thorough documentation of its previous impairment instances. The company has previously tested the recoverability of its assets or asset groups on every balance sheet date and has not made use of the option to only carry out impairment tests in the presence of impairment indicators. According to interviewed accountants, pursuing a trigger-based impairment-testing scheme will lead to substantial efficiency gains in the company. Also, organizational restructuring has led the company to redefine the definition level of CGUs. It decided to review the recoverable amount of assets at the BU level, which is one level below divisional segments as defined by IFRS 8. This procedure thus matches CGUs with BUs. The case company's BUs exhibit independent cash flows from each other, as required by the standard. Linking CGUs with reportable BUs also had the positive side effect of clear and separate management responsibilities. Independent cash flows and clearly attributable management responsibilities for each CGU ensure compliance with CGU definition requirements as in IAS 36.6 and goodwill impairment regulations as instructed in IFRS 3 and IAS 36.80. The company was also willing to contribute to scientific research and open towards systematic refinements of its impairment-testing scheme. Over the course of several months, the research team met with corporate accountants, the head of accounting consolidation, and business unit controllers to discuss and validate interim results and the established framework. For confidentiality reasons, meeting interactions were not transcribed.

4.4 Elaboration of a systematic framework of impairment indicators

This section is divided into two parts, reflecting the methodology in the establishment of the framework. In a first step, we present the procedure of finding relevant triggering events. We then elaborate the classification of the identified triggering events.

4.4.1 Identification of triggering events

Creating and understanding an exhaustive list of triggering events poses a great challenge for corporations. IAS and SFAS only name a limited number of triggering events that can thus only be considered principle-based proxies. We complement evidence from the standards and look at corporate practice by gathering evidence of

identified indicators in corporate financial reports. To our best knowledge, there is only one existing study that meaningfully addresses the limited knowledge on impairment indicators. Comiskey & Mulford (2010) analyze financial reports and scan them for mentioned asset impairment indicators. The study comes up with a list of reported triggering events from 43 companies resulting from the analysis of the financial reports of approximately 150 companies. The findings, some of which present the same reasoning only in different wording, are not systematically categorized to a sufficient extent. Given the scant academic evidence in literature findings, we additionally analyze the annual reports of today's constituents of the EuroStoxx 50 index for the last five years and scan them for mentioned triggering events. Used keywords include "impairment", "trigger", "write-off", as well as word-stem derivatives. The analysis of the EuroStoxx 50 company reports yields further instances of triggering events most of which represent identical instances to the analysis as performed by Comiskey & Mulford (2010). Some of these findings only provide boilerplate reasoning and thus cannot be adopted in the framework. Altogether, findings from corporate reports sum up to 52 consolidated impairment indicators. We take this list, together with the vague guidance of financial reporting standards, as a starting point for the research purpose of developing a triggering event framework. The gathered statements of the reports show company-specific characteristics; we adopt but adjust them to facilitate a more general applicability. For example, in 2014, GDF Suez (today Engie SA) recognized impairment losses on production and exploration-related assets due to falling gas prices in Europe. This identified triggering event is reflected in the framework in the more generic item *Significant price changes in markets for relevant input factors, markets of produced goods or markets relevant for customer demand*. In a next step in our research methodology and acknowledging the propensity of companies to use disguising rhetoric and euphemisms in the verbal sections of financial reports, internal accounting information of the case company were analyzed to complement the literature-derived findings. For the past nine years, all occurring impairment incidents were retrieved from the case company's internal information system. The list of impairments also included brief comments. We then discussed the documented incidents in greater detail with corporate accountants of the company with oversight

over all BUs, to obtain direct judgment on the reasoning for impairments. A noteworthy finding from the discussions was that frequently a number of indicators could be attributed to a single instance of impairment. Ultimately, all documented and identified indicators were allocated to their appropriate sub-categories and consolidated in a framework consisting of 72 impairment indicators.

4.4.2 Systematization of triggering events

To ensure a systematic monitoring of impairment indicators, the framework comprises different categories, each of which contain different triggering events to be tested. We adopt the general differentiation between internal and external impairment indicators as presented by IAS 36 as a first-level categorization. We then attribute single identified triggering events to one of the two dimensions and again group these dimensions into further categories. Tables 14 and 15 summarize the categorization of the single items and indicate the source of identification in the columns. Among the internal impairment indicators, many items reflect the performance of the referred company in terms of a *financial metric*. Reviewing performance using financial performance data in the form of metrics is quantitative in nature. The metrics we gather are important items or lines in the balance sheet, profit and loss statement, and cash flow statement, leading to the subcategory's title. However, they differ in the periods of time that are compared for the impairment testing purpose. We measure financial performance in different dimensions for this matter. While some metrics are used to compare current performance to comparable results of the previous period, other metrics measure current performance against planned performance. Negative future planning revisions against previous planning figures, i.e. current planning against previous planning, have also been identified as triggering events. These future planning revisions related to sales volume, sales revenues, and operating margin constitute important impairment indicators for that matter. Thus, assumptions on future business developments regarding different characteristics, dimensions, and time frames get formalized so that asset valuations can be better verified.

The category *M&A activities* includes triggering events related to the expectation of a disposal of asset groups or business entities, related specifically to a disposal of assets, activities, or parts thereof below book value, and related to synergy

expectations that are no longer valid. The category does not show any further sub-classifications. The category *restructuring* bundles impairment indicators concerning organizational change or expectations regarding changes in the composition of business activities. The category *restructuring* is not divided into further subcategories. The category *personnel* incorporates instances regarding the loss of key management, the breach of non-competition agreements of leaving key personnel, but also instances involving other employees. A final category listed among the internal impairment indicators concerns events of *bankruptcy and insolvency*. A triggering event occurs if the company or its subsidiaries are unable to service any kind of debt or if liabilities exceed the entity's assets. The test for bankruptcy and insolvency is also applied to suppliers and customers which factually leads to the dimension of external impairment indicators.

Many external impairment indicators deal with aspects regarding a company's upstream and downstream markets. Thus, the first category gathers triggering events that are associated with a company's *customers and suppliers*. Indicators within this category are designed to test the number and structure of customers, pricing power of customers and suppliers, i.e. business conditions in upstream or downstream markets, or the acceptance of own new products. A further category, *competition, market environment, products*, deals with the competitive environment surrounding a company. It monitors the general competitiveness in the industry, the behavior of competitors, launches of new products by competitors, and technological developments relevant for the business entity to be assessed with the impairment framework. The deterioration of the general economic environment or specific negative industry sentiment are often-cited triggering events in the asset impairment context. Monitoring relevant *macroeconomic* data is therefore a single category of external impairment indicators. Useful indications for potentially worsening business environments can be found in prices of public markets. The category *capital markets* distinguishes between equity, credit and currency markets. Lower equity multiples of peers, rising interest rates of sovereign debt securities, but also outstanding debt of peers or own debt that is already traded in public debt markets provide indications of the ability of companies to refinance on financial markets. Finally, unhedged currency exposures may pose substantial risks, particularly for international companies, which

is why significant changes in the value of relevant currencies must be regularly assessed to test for the recoverability of asset groups or business entities. *Commodity markets* form another category of impairment indicators reflecting the need to test for significant changes in the cost of input factors that may influence profitability levels but also cash flows. This category assesses prices of goods that are relevant in upstream and downstream markets, since price changes in the markets of customers and suppliers may ultimately influence demand and supply of the company's own products. The final category, *regulation and legal risks*, sums up relevant legal risks that must be observed by companies for a holistic impairment test. Table 15 shows different regulations that are of high importance in the automotive industry. The category, with its specific triggering events, highlights the importance of individualized impairment indicators within the generic categories. Clearly, companies operating in the automotive industry must monitor distinctive regulatory developments that are different from other industries.

The framework itself cannot automatically claim general applicability as it must reflect characteristics of the applying company at the specific indicator level. Within certain categories, specific peculiarities have to be included. In particular, financial metrics must be adjusted to fit the applying company's key performance indicators (KPIs). Customization is inevitable for individual applications of the framework. For instance, companies from different industries may not use the operating margin as the key margin in their performance management system but, for instance, an EBITDA metric instead.

Internal indicators	Corp. reports	Stand. setters	Case comp.
Fin. metrics: Balance sheet, P&L statement and cash flow statement			
Current/Past performance, current/planned performance			
Number of new orders sinking / below plan			x
Lower sales volume / Sales volume below plan	x		x
Lower revenues / Revenues below plan	x		x
Operating margin deterioration / Operating margin below plan	x	x	x
Profit fall / Profit below plan	x		
Decline in operating cash flow (oCF) / oCF below plan / Negative oCF	x		
Investment cash flow more negative than planned	x	x	
Delay in investment projects	x		
Dividends of affiliates / Associates declining / below plan or higher than earnings of the entity		x	
Rise in costs of purchased parts in % of sales to previous year / plans			x
Decline in inventory turnover against previous year / plans			x
Obsolete inventory	x		
Higher accounts receivables against previous year / plans	x		x
Unexpected idle production capacity			x
Significant or ongoing negative earnings			x
Damage of assets, knowledge of limited usefulness	x	x	
(Goodwill) impairment at subsidiary / associate		x	
Future / Future performance			
Significant negative plan revisions in terms of sales volume	x		x
Significant negative plan revisions in terms of sales revenues	x	x	x
Significant negative plan revisions in terms of operating margin	x	x	x
Changes in long-term growth-rate assumptions	x		
Changes in the used discount rate	x		
M&A activities			
Expectation that parts of a business unit or an entire business unit will be sold, closed or unwound	x	x	
Disposal of activities, assets, or parts thereof below fair or book value	x		
Downward revision of synergies	x		
Restructuring			
Sale or shift of activities (production of certain products or entire production facilities)	x	x	x
Significant strategic change	x	x	
Personnel			
Key personnel			
Resignation of key managers (middle or executive managers)	x	x	
Noncompliance with noncompetition agreements	x		
Change in management personnel	x	x	x
Employees			
Changes in number of employees	x		
Changes in wage agreements and remuneration	x	x	
Bankruptcy / Insolvency			
Own bankruptcy / insolvency	x		
Bankruptcy / Insolvency of subsidiaries	x		
Bankruptcy / Insolvency of customers	x		
Bankruptcy / Insolvency of suppliers			x

Table 14: Internal impairment indicators

External indicators	Corp. reports	Stand. setters	Case comp.
Customers / Suppliers			
Loss of one or more (key) customers	x		x
Significant changes in business with key customers	x		
Substantial change in customer mix	x	x	
Lack of acceptance of new products	x		
Price re-negotiations			x
Change in ownership structure of customer / supplier			x
Knowledge on changes in planning of customers			x
Unexpected decline in demand	x		x
Unexpected price increase in upstream markets			x
Unexpected price decline in downstream markets			x
Competition / Market environment / Products			
Product lifecycle: from high-tech to commodity business			x
Reduced product life cycles	x		
Higher competition level	x		
Unexpected activities of competitors	x		
Launch of new products by competition	x		
Irregularities or delays in own product launches	x		
Unexpected technological change	x	x	
Macroeconomics			
Deterioration of general economic conditions / economic climate	x	x	
Deterioration of economic conditions in relevant markets	x	x	x
Significantly detrimental economic and industry trends / forecasts	x	x	x
Capital markets			
Equities			
Lower market values of listed peers	x	x	
Lower margin multiples of peers	x	x	
Decline of outstanding shares	x	x	
Lower market values than book values	x	x	
Credit			
Rising interest rates / Access to credit markets	x	x	
Decline of outstanding debt securities	x		
Currencies			
Negative impact of relevant currencies	x	x	x
Commodity markets			
Significant price changes in markets for relevant input factors, markets of produced goods or markets relevant for customer demand	x	x	x
Regulation / Legal risks			
Precedents in general law	x	x	
Precedents in competition law	x		
Precedents in tax law			x
Environmental protection regulation			x
Emission standards			x
Promotion of renewable energies	x		x
Changes in regulation impacting own industry, customers or end markets	x		x
(Re)assessment of legal cases pending	x		

Table 15: External impairment indicators

4.5 Use of the framework

In the following section, we address different issues that arise if a formalized impairment indicator framework is implemented in corporate practice. It draws on the established framework and reflects insights from discussions with accountants and controllers of the case company.

4.5.1 Specification of the framework

The triggering event framework, as illustrated in the previous section, is a complete framework that can be used at different corporate levels. However, following requirements by IAS 36, the recoverability of asset values needs to be tested for single assets or, if not reasonable, for groups of assets or at the level of cash-generating units. For the application of the presented framework at the more detailed level of single business units, it must thus be adapted for optimal use. Specifically, single indicators that may be relevant at the corporate level are not relevant at the BU level. For instance, refinancing at the case company is usually carried out by corporate management for the combined operations and not by unit-level management individually. The external impairment indicator of access to credit markets would thus not need to be monitored at BU level. Other business units may not be dependent on market-traded input factors. The framework, with its specific impairment indicators, must therefore be customized for specific applications.

4.5.2 Definition of thresholds for quantitative performance metrics

The listed impairment indicators are different in their format. Most indicators are qualitative and require the assessment of specific unit-level management. Developments regarding the launch of new products by competitors or changes in a product or service's lifecycle must be assessed by operational managers. The indicators of the categories *financial metrics* and *macroeconomics* can be tested using internal reporting systems or external databases. Strict guidelines should be instituted for each of these items, defining the relative or absolute deviations from plan or previous-year performance that substantiate a triggering event. For a more effective enforcement of accountability, a company's unit management should not only indicate the occurrence of a triggering event for the qualitative items in the framework in a

binary manner, but should also be brought to make brief comments on the reasoning for their judgment. This will not only document management's awareness or judgment of potential impairments, but will also help in retrospect to examine the visibility of a write-off should an impairment loss occur.

4.5.3 Qualified comments on business developments and risks

Seeking qualified comments of unit-level managers on potential impairment subjects can give corporate managers and accountants valuable insights from local management, that has better insights into the various markets. However, not only qualitative items in the framework should require qualitative judgment through comments by management; managers should also be given the opportunity to overrule the strict interpretation of quantified performance thresholds that would technically indicate triggering events. If the share of purchased parts in total costs rises significantly to previous-year figures, owing to altered make-or-buy decisions for a product, managers should be able to overrule the strict, quantified logic and should be able to flag reasons for their decision in a comment. Interviewed corporate-level controllers and accountants of the case company particularly hoped to obtain more honest asset valuations via a formal documentation of the qualitative assumptions of unit-level managers for the qualitative indicators. Applied on a quarterly basis, the use of the framework facilitates regular business risk control that, as case company accountants in the case company flagged, would help them in their interactions with auditors.

4.5.4 Consolidation of indicator tests

The presented indicator framework lists numerous items to be tested for each asset group subjected to an impairment test. Before institutionalizing a comprehensive asset impairment framework, strict rules for its application should be introduced. Depending on how rigid and challenging the thresholds for the quantitative performance metrics in the framework are set, companies need to decide whether a single observed triggering event raises a red flag and leads to a full impairment test of the asset group, or whether several triggering events need to be recorded to trigger the impairment testing procedure. In the case company, past impairments were often

attributable to several triggering events. Discussions also revealed the possibility of creating a three-color signal scheme for the quantitative performance metrics and only a two-option assessment for the qualitative items of the framework. The consolidation of the different triggering event assessments into a single decision to conduct an impairment test for each asset group leaves room for creative approaches but should remain clear and not too complicated.

4.5.5 Frequency of indicator testing

The financial metrics category of the framework requires the comparison of recorded performance with planned performance and seeks to track significant planning revisions. Logically, corresponding monitoring activities of triggering events should take place after corporate planning activities. The operative planning or budgeting process typically takes place at the end of a business year. So mid-term plans typically only change once a year whereas forecasts for a business year can be updated every month or every quarter. Besides evaluating planning deviations, other items represent instances that are not necessarily detected at planning updates but could happen at any time. The majority of identified framework items can be tested on an ongoing basis. As described, parts of the triggering event assessment build on the results of the operative planning process. Conversely, a thorough implementation of the standard may lead to changes in the planning process itself (Nilsson & Stockenstrand, 2015). If not already applied, crucial items, that are addressed in the triggering event framework and can be planned, should be integrated into corporate planning processes. This way, information on the relevant identified impairment factors can be retrieved directly from the appropriate corporate level. Each planning unit subjected to a separate impairment test should also show clear management responsibilities to enable qualified asset valuation assumptions and drive accountability.

4.6 Discussion, limitations, and implications

The framework of triggering events, as elaborated on in this study, fills the gap that IAS 36 leaves its users. Drawing on findings from literature, indications as prescribed by standard setters, and insights from a case company, this paper shows the elaboration process that produces a framework comprising of 72 impairment

indicators. They have been categorized into different sub-categories of internal and external impairment indicators. The identified impairment indicators show peculiar characteristics. What is striking is the number of qualitative factors. While some triggering events resemble quantitative input factors in discounted cash flow calculations, the majority of factors are qualitative and reflect the assumptions that underlie the calculation models. Based on the study by Comiskey & Mulford (2010) that analyzes reports from US companies applying US GAAP, our research contributes by complementing the findings with an analysis of European companies that apply IFRS and by further considering insights from a case company. The findings result in a systematic framework as appropriate for a company in the automotive industry. The framework supports a rigorous accounting of asset types, including goodwill. Furthermore, the approach of analyzing corporate reports yields a broad framework of also qualitative indicators that have led to impairments in corporate practice. Most of these qualitative indicators cannot be addressed in quantitative and archival research on determinants of asset and goodwill impairments (e.g., Boennen & Glaum, 2014).

Future research may adopt items of the framework and may test their significance and early-warning qualities in predicting later asset impairments. Large-scale empirical research on the presented triggering events and their significance may not be easy to conduct, however, since items as established in the impairment testing framework are seldom publicly available, but require knowledge on company-internal management judgment. Hence, at least some of the indicators may precede quantitative research. One of the aims of this research was to collect a multitude of indicators. It is in the nature of complex business environments that often an array of developments can be named to be triggers a discontinuity. Redundancy of indicators cannot completely be ruled out but was also not sought after. The possible redundancy of triggering events was also not considered an issue by accountants and controllers in the case company. Furthermore, generalizability is always an issue with case studies. However, Power & Gendron (2015) note that particularly audit-related research may benefit from a variety of research. Particularly, qualitative research allows for a diffusion of innovative and different viewpoints. As stated, the framework has a clear focus on the automotive industry. Nevertheless, the general structure of the

framework and, most importantly, the identification process can be applied to different industries and companies. As certified by interviewed accountants of the case company, the trigger-based systems monitoring approach will reduce resources necessary for the impairment process given the complexity of the organization. It cannot be excluded, however, that companies with more simple business models and organizational structures find it more appropriate to calculate asset values at all relevant dates.

As shown, a formalized and systematic review of all business-relevant factors enables a full assessment of the recoverability of assets and can benefit different stakeholders. Also, an implementation can mitigate company-internal agency conflicts. A formal framework distributed across the organization forces unit-level managers to systematically deal with relevant value drivers and performance metrics. Otherwise implicit and tacit assumptions can be formally documented. Within the applying organization, corporate accounting as the central authority can distribute specific unit-level frameworks to local management units. Besides the usability for asset impairment purposes, the framework gives corporate management a comprehensive assessment of business risks and outlooks at unit level. The framework is thus helpful beyond the sole purpose of impairment accounting. Besides company-internal benefits, documented evidence on management assumptions can also render discussions between management and audit partners more effective. The formal documentation of valuation assumptions can signal effective internal controls. If implemented in organizations, auditors with full access to documented assumptions and metrics can better understand their clients' asset valuations and can thus achieve greater reliability in their own evaluations and assurance of asset values. This case study demonstrates how current regulations can be interpreted with an intent to fully adhere to standards. In its presented form, the framework is useful for adopters and auditors alike. Yet, it remains an open question whether companies will provide detailed information to auditors or the public in the absence of binding instructions or stricter enforcement.

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