Entrepreneurship

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Management Control in Small and Medium-Sized Enterprises

Indirect Control Forms, Control Combinations and their Effect on Company Performance

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Entrepreneurship

„Entrepreneurship“ ist ein noch relativ junger Forschungszweig, der jedoch in Wissenschaft und Praxis stetig an Bedeutung gewinnt. Denn Unternehmensgründungen und deren Promotoren nehmen für die wirtschaftliche Entwicklung einen zentralen Stellenwert ein, so dass es nur folgerichtig ist, dem auch in Forschung und Lehre Rechnung zu tragen.
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Jens Hutzschenreuter

Management Control in Small and Medium-Sized Enterprises

Indirect Control Forms, Control Combinations and their Effect on Company Performance

With a foreword by Prof. Dr. Malte Brettel

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Foreword

Management control is one of the key management functions, but has been rarely addressed in academic research. Amongst other reasons, this disinterest might be rooted in the typically negative connotation of the term ‘control’. Academics rather prefer topics like strategy development, planning or organizational topics over control. Paradoxically, academics and managers both are highly interested and concerned with visions, strategies and plans; however, the majority of them fail or are not implemented successfully. One of the key reasons for this is the fact that the implementation and the subsequent control conducted by managers are often neglected.

Managers could delegate the execution of plans and strategies to their subordinates; however, they have to take into consideration which activities can be delegated and how the progress should be controlled. Neither science nor practice has been able to provide acceptable answers to this open issue; thus there is a significant research gap. The research gap in the context of small and medium-sized enterprises (SMEs) is even larger – control here has been explored only in a considerably small number of studies. In the setting of small and medium-sized enterprises previous research has already demonstrated that management control is of greater importance than planning activities. This highlights the relevance of the research problem on how control should be executed in SMEs again.

The thesis of Jens Hutzschenreuter specifically addresses this research topic. For his research he aims at “enhancing the knowledge about management control forms in general, with special emphasis on SMEs” and achieves this in a very interesting way.

The thesis of Mr. Hutzschenreuter is not only theoretically well-founded, it also presents an extensive empirical testing of the theoretically developed assumptions. The results are of particular interest for both researchers and practitioners. Typically, managers employ direct forms of control by defining results and processes for subordinates although these control forms show only limited effectiveness. At the same time, the effect of indirect control mechanisms like employee selection and the company culture's impact on the employees' behavior is often neglected. The performance of indirect management control has shown a consistently greater impact than direct forms of control. Moreover, the results show a broad applicability also in other organizational settings.

Mr. Hutzschenreuter has not only written a thesis that is highly sophisticated from a theoretical point of view which will guide future researchers in this domain, he also produced very interesting findings which are helpful for the demanding managerial practice.

In this respect, I wish that this thesis will receive the broad audience it deserves.

Malte Brettel

Preface

This study was accepted as a dissertation in the summer of 2009 at the Faculty for Business and Economics of the RWTH Aachen University. I know that this would not have materialised without the comprehensive support of various people.

In the first place, I would like to thank my doctoral father, Prof. Dr. Malte Brettel, for accepting me as a research assistant. At his chair, he has developed an amazing working culture that fosters individual development and at the same time provides guidance on how to tackle the numerous difficulties in a doctoral thesis. By doing so, he significantly supported this thesis. Secondly, I want to express my gratitude to Prof. Ian MacMillan, DBA, Professor of Management at the Wharton School, University of Pennsylvania. I thank him for the opportunity to participate in his Visiting Scholar Program in the year 2008. The discussion with him and his team contributed significantly to deepen the understanding of the topic and this thesis. Furthermore, I would like to thank Prof. Dr. Rüdiger von Nitzsch for taking over the role of the second advisor.

My colleagues at the Chair of Business Administration for Engineers and Scientists also contributed to this dissertation in various ways. The traditional "Lehrstuhltage" facilitated great discussions and fun both during the day- and night-time activities. The work together with my colleagues Tessa and Sebastian for the automotive innovation network car Aachen e.V. was challenging but at the same time associated with a lot of fun and great results.

I would also like to thank all my friends in supporting me during the work on the dissertation. It was great to have the assurance that I would have their support even during difficult times. I particularly thank Andreas, Jens, Kathrin & André, Manuel and Thomas who were always there to listen to my worries.

Above all, I am deeply thankful to my family: to my sister Anke who helped me with her strong analytical focus in the statistics section and with her fruitful advice during the writing phase, and to my parents, Brigitte and Paul Hutzschenreuter, who contributed with their ability to motivate me and with their tremendous support throughout my education. Hence, I dedicate this thesis to my family, with the conviction that it would have been impossible to come this far without their timely help and support.

Jens Hutzschenreuter

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List of abbreviations

AMOS	-	Analysis of Moment Structures
AoMJ	-	Academy of Management Journal
AoM	-	Academy of Management
AVE	-	Average variance extracted
BC	-	Behavior control
CC	-	Cultural control
Cf.	-	Compare (latin: confer)
CFA	-	Confirmatory factor analysis
CI	-	Condition index
CoC	-	Coefficient of Congruence
df	-	Degrees of freedom
ed.	-	Edition/editor
EM algorithm	-	Expectation Maximization algorithm
EVA	-	Economical Value Added
GDP	-	Gross Domestic Product
LISREL	-	Linear Structural Relations
MCS	-	Management control system
NEF	-	New economy firm
PDF	-	Portable document format
PLS	-	Partial Least Squares
PC	-	Personnel control
RC	-	Results control
SEM	-	Structural equation model(ing)
SME	-	Small and medium-sized enterprise
p./pp.	-	Page/pages
SPSS	-	Statistical Package for Social Sciences
TQM	-	Total Quality Management
US(A)	-	United States (of America)
VIF	-	Variance inflation factor

1 Introduction

1.1 Problem statement

Management practices have been widely studied in the strategic management and organization research literature.[1] Major questions articulated were how organizations formulate strategies, evaluate a competitive strategy, achieve market orientation or gain competitive advantage through management practices.[2] A number of management frameworks have been developed and applied to assure a systematic approach to management practices.[3] While strategic planning activities or organizational aspects have seen in-depth inquiry, actual strategy implementation has hardly been considered. [4] However, in recent years, this aspect of management gets increasing attention from executives and researchers, validating the remark that "the best-laid plans are worthless if they cannot be implemented successfully."[5] In this sense, recent research suggests that the majority of implementation efforts are in fact unsuccessful.[6]

Since managers are not able to carry out all relevant implementation activities by themselves, responsibilities are to be necessarily delegated to subordinates. However, delegation is almost always associated with the risk of employees not behaving in a way that is consistent with the intended behavior.[7] Hence the most important aspect of a manager's job is undoubtedly the execution of control.[8] By doing so he ensures that the previously developed plans are implemented and that the individual's goals are congruent with the organization's goals.[9] Despite its fundamental importance for managerial life, control never gained so much attention as strategy, planning or marketing research.[10] Or, as SPECKBACHER stated during the Academy

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1 Cf. for example Drucker (1954); Koontz/O'Donnell (1955); Carroll/Gillen (1987); Thom (1990); Huselid (1995); recently McGrath (2007).

2 Cf. for example Schuler et al. (2002); Collins/Clark (2003); Zatzick/Iverson (2006); Neilson et al. (2008).

3 Cf. Jaworski (1988), p. 23; Simons (1994), p. ix.

4 Cf. Pryor et al. (2007), p. 3.

5 Simons (1994), p. ix; in the same sense Aaltonen/Ikavalko (2002) says that "[E]ven the most superior strategy is useless" without coherent, aligned implementation (p. 415).

6 Cf. Dobni/Luffman (2003), p. 577; Sterling (2003), p. 27; Allio (2005), p. 12; Kaplan/Norton (2008), p. 64.

7 Cf. Jaworski (1988), p. 23.

8 Although managers do other things, the exercise of control is a dominant part of the manager's job. Cf. Fayol (1916); Fayol (1929), p. 24; Nordsieck (1955), p. 25; Mellerowicz (1976), p. 99; Albach (2000), p. 12; Alvesson/Karreman (2004), p. 424.

9 Cf. Merchant/Stede (2003), p. 4. Boag (1987) describes control as "keeping things on track" (p. 365).

10 Although control is regarded as equally important to planning, it is typically considered only marginally in the German controlling literature. Refer to Schwartz (1974), p. 5; Siegwart/Menzl (1978), p. 85; Pfohl/Stölzle (1997), pp. 3-5; Weber/Schäffer (2006), pp. 232-233; and Horváth (2006), pp. 149-150. For an in-depth discussion refer to Schäffer (2001), p. 2.

of Management Meeting 2008, "Everybody is talking about strategy and planning, but nobody is talking about control."[11]

The most essential effect of control is that "people in the organization do what they are supposed to do;"[12] in this sense, controls ensure that the organizational resources are allocated in an optimal way. The definition of control evolved over the years "from a focus on formal, quantifiable information to assist managerial decision making to include . . . informal, personal and social controls."[13,14] These indirect controls are considered particularly beneficial, as they can be used in addition to direct controls;[15] in particular, they use self-control mechanisms and social controls to influence employees' behavior without the need for immediate interaction with the employee. Due to their importance, indirect controls have gained significant interest recently from researchers of different areas.[16]

Although managers only sparingly use accounting information from the accounting department to execute control, they are the key entities to execute control in organizations. Managerial activities to achieve control are referred to as management control while the corresponding systems of control are referred to as management control systems (MCS). Consequently, if an effective MCS is implemented, organizational resources are expected to be distributed effectively, and that improves the overall company performance. However, only a very few previous research findings supported the positive performance effects of indirect control forms. Researchers like SNELL/YOUNDT (1995) or LIAO (2005) were able to provide evidence for a positive impact of certain aspects of indirect controls on organizational performance, but those research efforts were focused on large, established organizations.[17]

This study argues that small and medium sized enterprises (SMEs) are an ideal research object to study the performance effect of indirect forms of control.[18] In contrast to large organizations, SMEs typically show 'organic' organizational structures.[19] This means that SMEs are characterized by open, informal communication and working relationships and

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11 Quote of Prof. Gerhard Speckbacher during the presentation of his paper at the Academy of Management Conference 2008, Anaheim; see also Speckbacher/Wentges (2008).

12 Anthony et al. (1989), p. 6; in the same sense Simons (2000), p. 4: Control are the "techniques that effective managers use to set direction and achieve desired […] goals for the organizations they lead."

13 Collier (2005), p. 1.

14 Cf. Sandelin (2008), p. 325.

15 Cf. Fisher (1998), pp. 61-62.

16 Cf. among others Ouchi/Maguire (1975); Ouchi (1979); Berry et al. (1995); Lukka/Granlund (2003); Granlund/Taipaleenmaki (2005).

17 Cf. Snell/Youndt (1995), pp. 728-731; Liao (2006), pp. 304-305.

18 Cf. Hitt et al. (1990), p. 33.

19 Cf. Filley/Aldag (1980) and Perez-Sanchez et al. (2003), p. 72; Large organizations are typically characterized by beaurocratic structures, standardized processes and high levels of formalization, as documented in Ghobadian/Gallear (1996), p. 86.

quick decisions and low levels of structural control prevail.[20] Indirect controls are thus especially present in SMEs due to the informal nature of their organization.[21] Recent research suggests that management control in fact operates different in these informal organizations.[22] Till now, MCS research has studied MCS in SMEs only to a small extent. And when it was studied, previous research efforts focused primarily on usage or adoption patterns and not on efficiency or performance consequences. However, focusing on organizational effectiveness may lead to crucial improvements of MCS in SMEs.

Neglecting SMEs as a research object is especially critical, as SMEs are facing serious challenges in relation to management control: they are faced with low levels of human, financial or organizational resources. For instance, low level of management resources result in limited availability of management for executing control or process reviews with employees. Preliminary results show that the overall function of management control actually exerts an influence on company performance. BRETTEL ET AL. (2006) showed in their study on operational management in young and innovative enterprises that the performance effect of management control even exerted its impact on planning activities.[23] In line with this, SANDINO (2007) even suggests that 30% of the sales growth variance can be attributed to the introduction of an MCS in SMEs.[24] Hence, MCS are expected to be of supreme importance for organizations in general and for SMEs in particular, where they address critical liabilities.

Thus, one of the key questions for the management of SMEs is how they can make optimal use of their available scarce resources and compete successfully with larger organizations. Therefore, there is a strong need for clarification on how MCS operate in SMEs and influence organizational performance. This study seeks to advance the available knowledge on this research field further.

1.2 Relevant research

In order to systematically derive research questions for this dissertation, the following chapter reviews the related functional areas of business administration, provides an overview of previous research in the field of SMEs and discusses the research gaps present in the currently available literature.

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20 Cf. Wittlage et al. (1987), p. 83; Thom (1990), p. 21; Meyer (1991), p. 49.

21 Cf. Amat et al. (1994), pp. 118-120; Granlund/Taipaleenmaki (2005), pp. 46-48; Collier (2005), pp. 331-334.

22 Also referred to as postbureaucratic organizations. For management control in specifically in postbureaucratic organizations see Styhre (2008), p. 635.

23 Cf. Brettel et al. (2006).

24 Cf. Sandino (2007), p. 287; in the same sense Frese (1968), p. 5.

DAUTEN ET AL. (1958) stated that control "appears to be one of the most neglected and least understood areas of management activity."[25] Following this claim, academics increasingly investigated control in a more systematic way.[26] In these studies the concept of management control in SMEs touches four relevant research areas: management accounting, human resource management, organizational research and small business management. The following section reviews the contribution of the various research streams to management control and summarizes the specific findings in the context of SMEs.

Traditionally, the field of *management accounting* focused its attention mainly on the application of specific tools like budgeting, variance analysis and their antecedents and consequences thereof. Management accounting is historically concerned with the question of how information from accounting systems can be used to support organizational decision making. This shift from pure accounting-oriented 'bean-counting' to participation in managerial decision making processes also fostered the development of management control. In the field of management accounting, MCS is considered as a set of "formal, information-based routines and procedures managers use to maintain or alter patterns in organizational activities."[27] Concerning the connection between management accounting and management control, ALVESSON (2004) even argues that "the whole idea of management accounting, for example, is founded on the belief that management control is possible, important, and, indeed, necessary."[28] Traditionally, this research stream focused on direct forms of control based on the various tools and techniques developed in the field of management accounting.[29] Researchers increasingly argue that the traditional, technocratic forms of control should be extended beyond the familiar terrain to a softer, more organic type of control.[30]

Research on the area of *human resource management (HRM)* predominantly emphasized practices like incentive systems and compensation practices, recruiting policies or training. Numerous researchers previously argued that all of these practices bear a certain relationship to organizational performance as they ensure optimal usage of the human resources.[31] Building on this, SNELL/YOUNDT (1995) suggested that the concept of control is the lens of all HRM practices that links them to organizational performance: "Thus, organizational

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25 Dauten et al. (1958), p. 41.
26 Cf. Sjurts (1995), p. 1.
27 Simons (1994), p. 5.
28 Cf. Alvesson/Karreman (2004), p. 423.
29 In addition, researchers like Alvesson/Karreman (2004) admit that there also has been a strong "either-or orientation" (p. 423) in relation to particular forms of control; consequently, research on a broad set of techniques (including both direct and indirect forms of control) has been sparse. Similarily, the simultaneous application of control techniques (control combinations) had previously not beeen considered.
30 Cf. Alvesson/Karreman (2004), pp. 425-426.
31 Cf. Becker/Gerhart (1996); Delaney/Huselid (1996); Youndt et al. (1996); Bowen/Ostroff (2004); Le Chien/Truong (2005); Liao (2005).

performance is the raison d'être for HRM control–its mismanagement can lead to confusion, inefficiency, and the like, but the absence of HRM control ultimately leads to organizational demise."[32,33] Hence, different aspects of HRM contribute to the overall construct of control. As a consequence of this finding, researchers started showing more interest in studying the control effect of HRM practices and their various outcomes.[34] Driving this knowledge further and following the management accounting discipline, HRM scholars became increasingly interested in social and cultural factors and also in how they affect the human resources of organizations that manifest themselves in the implementation of group incentives, for example.[35] A key concern of HRM is the question whether a successful HRM system is of a universal nature or merely dependent on internal and external factors.[36] Historically, the research focus of HRM remained on large organizations with their international operations, complex organizational structures and fragmented responsibilities. HRM theories and strategies are typically developed in large organizations and tested there as well. As a result, despite the strong practical relevance of HRM for SMEs, previous research hasn't yet addressed it to its fullest extent.[37]

Organizational research is concerned with controls in relation to their role in organizational design. It can be traced back to the early beginnings of organizational research. Starting in the 1960s with the work of CYERT/MARCH (1963), THOMPSON (1967), PERROW (1970), WOODWARD (1970) and WILLIAMSON (1975), it gained significant momentum in the academic field.[38] Key contribution to this field came from the work of OUCHI (1977, 1979) on organizational controls that defined three distinct organizational approaches to control (market, hierarchy, and clan).[39] Subsequent research developed the topic further while investigating socialization, principal-agent relationships and performance evaluation.[40] In this field, controls are considered not so much a management tool to direct behavior, rather as an element in organizational design. Consequently, effectiveness as an outcome had only a low relevance in this research stream. Only recently did CARDINAL ET AL. (2004) reactivate the research stream to investigate the changes of organizational control during the life cycle of a company.[41]

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32 Snell/Youndt (1995), p. 712.
33 In the same sense Paauwe (2009), p. 130.
34 Cf. Youndt et al. (1996); Liao (2005); Chang/Huang (2005); Wright et al. (2005); Liao (2006).
35 Cf. Merchant (1985a), pp. 40-41 and further in Merchant/Stede (2003), pp. 74-75.
36 Cf. Youndt et al. (1996), p. 837; Fisher (1998), pp. 47-48.
37 Cf. Heneman et al. (2000), p. 12.
38 Cf. Cyert/March (1963); Thompson (1967); Perrow (1970); Woodward (1970) and Williamson (1975).
39 Cf. Ouchi/Maguire (1975); Ouchi (1977); Ouchi (1979); Ouchi (1980).
40 Cf. Eisenhardt (1985); Merchant (1985b); Bradach/Eccles (1989).
41 Cf. Cardinal et al. (2004).

Despite the previous findings in the three functional research areas, the question still remains whether the findings from large organizations are equally applicable to small organizations. Refering to this question, WELSH/WHITE (1981) pointed out that "a small business is not a 'little' large business."[42]

Small business management, the fourth research area related to the topic of this study, specifically addresses these issues by providing useful guidance on how small enterprises should be operated. PEREZ-SANCHEZ ET AL. (2003) argue that there is a specific need for this as the management practices that "work in large organizations proved to be ineffective in small organizations." They go on to expantiate on this point: "SMEs tend to demand rather holistic systems due to their liabilities. In addition, SMEs require different management practices."[43] Specifically, researchers revealed the organizational and functional characteristics of SMEs in relation to their management systems.[44] Supporting SMEs by increasing their competitiveness and ultimately improving their overall success has been a very favourite topic of small businesses management.[45] Hence, the effectiveness of specific management techniques and the associated contingent factors are of particular relevance for small business management research as well.

The transition from direct to indirect controls is a common denominator across the first three research areas. In addition, the growing research interest in improving management practices in SMEs underlines the need for action in the academic field related to the area of study. Researchers from the four areas already offer valuable insights into the usage and consequences of management control in SMEs. Table 1 summarizes the relevant previous empirical results from all four areas.

Author	**Research approach**	**Control concept**	**Findings**
BOAG (1987)	Exploratory (n=20)	Direct & Indirect	Reveals that greater control of marketing operations correlates with stronger market performance and profitability in early growth firms. Development of marketing control systems major stumble block for new ventures.
AMAT, CARMONA, ROBERTS (1994)	Exploratory (n=1)	Direct & Indirect	Discusses development from Spanish family-run business with informal controls to professional organization with management accounting system (MAS). Simultaneous formalization and professionalization of management resources during political and economical change

[42] Welsh/White (1981), p. 18.
[43] Perez-Sanchez et al. (2003), p. 72.
[44] For a detailed discussion on the characteristics of SME management refer to Ghobadian/Gallear (1996), p. 87.
[45] Cf. e.g., Yusuf (1995); Lin (1998); Warren/Hutchinson (2000).

Author	Research approach	Control concept	Findings
ROMANO, RATNATUNGA (1994)	Exploratory (n=18)	Direct	Demonstrates the impact of formal planning and control systems (FPC) on small firm growth. Shows that FPC is an important element in managing high-growth firms at stages of 'mature' growth and a relevant factor in the evolution of the firm.
PERREN, GRANT (2000)	Exploratory (n=4)	Direct	Develops a sociological view on the introduction of management accounting practices by owner-managers using a social-construction perspective. Proposes that MAS can be understood as a 'micro-world' of control constructed by the owner.
GREENHALGH (2000)	Exploratory (n=1)	Direct	Discusses the development of a transnational system of management controls using solely established accounting controls techniques (instead of any innovative tools). Emphasizes the importance of contingent factors like environment, strategy and complexity for MCS design.
MOORES, YUEN (2001)	Confirmatory (n1=49, n2=10)	Direct	Reveals the change of an MAS structure during life cycle towards increasing formality (in the apparel industry). Points out that growth firms put particular emphasis on the formalization of MAS, with discriminating characteristics between different phases being existent.
WIJEWARDENA, ZOYSA (2001)	Exploratory, (n=473)	Direct	Determines the positive impact of financial planning and control (budgeting/budgetary control) on the performance of Australian manufacturing SMEs. Shows that the usage of comprehensive budgetary control processes increases sales performance.
CARDINAL (2004)	Exploratory (n=1)	Direct & Indirect	Develops dynamic theory of control: determines triggering events (e.g. crises) for the introduction of new controls. Reveals a balance-imbalance-rebalance (i.e. latency) process of introduction and change of controls.
WIJEWARDENA, ZOYSA, FONSEKA, PERERA (2004)	Exploratory (n=262)	Direct	Discusses control sophistication as a significant contributor to the sales performance of manufacturing SMEs in developing countries.
COLLIER (2005)	Exploratory, (n=1)	Direct & Indirect	Reveals the dominance of social control techniques over traditional accounting figures during the international expansion of an SME (adoption and transition perspective). Entrepreneur's personality is shown to be an important contingent factor in the emergence of a MCS.
GRANLUND, TAIPALEENMÄKI (2005)	Exploratory (n=9)	Direct	Exposes differences between the control configurations of new economy firms and of firms operating in traditional environments; shows the need to adopt MCS along the life cycle. Meeting expectations of external stakeholders as an important driver for the adoption of MCS.

Author	Research approach	Control concept	Findings
DAVILA (2005)	Exploratory (n=95)	Direct & Indirect	Describes adoption patterns of 3 management control forms (results, action, personnel control) in early-stage firms. Develops antecedents for the introduction of controls.
DAVILA, FOSTER (2005)	Exploratory (n=78)	Direct	Analyzes adoption patterns of 11 management accounting systems (e.g. budgets, variance analysis, profitability calculations) in early-stage firms. Shows that short time to adopt budgetary control is associated with superior company performance.
DAVILA (2007)	Exploratory (n=78)	Direct & Indirect	Develops adoption patterns of 46 management control techniques from 8 MCS categories along company age. Reveals several antecedents for adoption. Shows direct performance effect based on the implementation intensity of overall MCS.
BERTHELOT, MORRILL (2007)	Confirmatory (n=230)	Direct	Demonstrates positive effect of strategic planning and HRM MCS adoption on financial performance. Firm size and access to expertise identified as major drivers to the adoption of MCSs.
SANDINO (2007)	Confirmatory (n=97)	Direct	Reveals four basic types of MCS implemented initially in retail sector start-ups, choice contingent on company's strategy: basic MCS (omnipresent), cost MCS, revenue MCS, risk MCS. Fit of MCS to strategy found to be associated with superior performance.
SANDELIN (2008)	Exploratory (n=1)	Direct & Indirect	Investigates two fundamental control packages within one fast-growing communication company. Raises the importance of internal consistency of control and internal requirements and contingent factors.

Table 1: Summary of empirical findings on management control in SMEs[46]

While reviewing the related fields of research and the current literature, three fundamental limitations emerge. The first is the prevalence of a lack of coverage of indirect control forms. Although indirect control proved to be successful in the early studies in large organizations, their impact and effects in SMEs are considered only partially. As early as in 1975 OUCHI and subsequently various other researchers had developed models that explain indirect alternatives to personal surveillance of employees.[47] Limited previous empirical work exists on the appli-

[46] Own illustration.

[47] Cf. Ouchi (1979), p. 937; Jaworski/MacInnis (1989), p. 408; Snell (1992), pp. 294-295; Snell/Youndt (1995), pp. 712-713;

cation of these indirect control forms in SMEs, despite the traditionally strong corporate culture and the dependence on frequent personal interaction in these small organizations.[48]

Secondly, SME oriented management control research has neglected organizational effectiveness as an outcome of control systems. OTLEY (1980) claimed that "consideration of organizational effectiveness is a vital part of a true contingency theory of control system design. This has been a much neglected topic from a theoretical stance and its development is urgently needed."[49] Interestingly, in the context of small organizations, previous research had put its primary focus on adoption and usage patterns or behavioral consequences like job satisfaction. Only two research projects investigated the adoption of management controls and the impact on organizational performance.[50]

Finally, there is a critical gap between real life management control application and current research. On the one hand, there is an ongoing discussion about the actual nature of management controls and their effect on organizational performance. Researchers like ARTHUR (1994) or HUSELID (1995) claim that management controls are of universal nature so that the application of these control forms can be considered a best-practice example.[51] The roll-out of this practice to a broad range of other organizations is considered to be highly successful. Other researchers like SNELL/YOUNDT (1995), YOUNDT ET AL. (1996) from HRM research and FISHER (1998) claim, on the contrary, that the usefulness and effectiveness of control are highly dependent on the organizational context and, therefore, state that control is expected to be of a contingent nature.[52] This raises again the importance of a careful selection of the expected effect and the potential consideration of contingent factors in the study.[53] On the other hand, control research typically focuses on different techniques or functions instead of considering the overall control configuration.[54,55] In all related fields of research and in the previous SME MCS research, the application of different controls in combination with other controls has been an underexplored topic up to now.[56]

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48 Cf. Amat et al. (1994), pp. 118-120; Granlund/Taipaleenmaki (2005), pp. 46-48; Collier (2005), pp. 331-334.
49 Otley (1980), p. 423.
50 Cf. Davila/Foster (2007); Sandino (2007).
51 Cf. Arthur (1994), p. 684; Huselid (1995), pp. 643-644.
52 Cf. Snell/Youndt (1995), p. 711; Youndt et al. (1996), p. 837; Fisher (1998), pp. 47-48.
53 Cf. Paauwe (2009), pp. 129-130.
54 For example, see the discussions in the field of management accounting research.
55 For a case study on two control combinations in an SME see also Sandelin (2008).
56 Cf. Malmi/Brown (2008), p. 287.

1.3 Research questions

This study aims at enhancing the knowledge about management control forms in general, with special emphasis on SMEs. The following section builds on the research gaps identified and develops four research questions.

Organic controls or indirect controls, as referred to in this study, build on a mechanism different in effect from that of direct forms. Instead of interacting in a direct way with the employee, indirect controls alter the working environment the employees operate in.[57] These rather non-traditional controls are receiving increasing interest of researchers, as they have the significant advantage that they are not perceived to be as direct as traditional tools like budgeting, incentive systems or frequent process reviews.[58] Typically, informal controls such as group norms, socialization, and culture are neglected in organizations as they do not appear on organization charts, and in policies and procedures and are not reflected in financial and non-financial performance reports.[59] Yet, "focusing on a few financial or non-financial formal controls is an under-specification of an organization's control system."[60] Successful control systems, however, consist of a combination of formal, system-based and informal socio-cultural controls as both types address different modes and levers of control.[61]

The literature on MCS in SMEs previously focused on the usage and adoption patterns of controls. Other researchers provide broad empirical evidence on the behavioral and personal consequences of control in organizations. Despite the importance of understanding these patterns, they only provide a partial view on the organization. The perspective of organizational performance complements the other findings with a stronger focus on outcome and an implicit cost/benefit calculation. SCHÄFFER (2001) even considers the control-performance link to be a 'white spot' in the research landscape.[62] Only if the control efforts and benefits are considered as well, researchers and managers can define an 'optimal' MCS for an organization.

To the best of the author's knowledge, there are only three studies related to the performance effect of management control in SMEs.[63] DAVILA/FOSTER (2007) showed that the time-to-adoption of specific management control techniques and company performance are inversely related. The results of BERTHELOT/MORRILL (2007) suggest that an adoption of certain MCSs

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57 Chenhall et al. (2008) found that the use of organic controls even increases the bonding between members of organizations (pp. 37-39).

58 Traditional controls are typically perceived as uncomfortable and overly restricting employee behavior. See Schäffer (2001), p. 2.

59 Cf. Collier (2005), p. 324.

60 Langfield-Smith (1997), p. 226.

61 Cf. Collier (2005), p. 325.

62 Cf. Schäffer (2001), p. 4.

63 Cf. Berthelot/Morrill (2007); Davila/Foster (2007); Sandino (2007).

(strategic planning and HRM related) is associated with superior financial performance in SMEs.[64] In a similar sense, SANDINO (2007) found a positive relationship between organizational fit of the MCS and company performance. The performance perspective of individual control forms, however, remains open. This study specifically addresses this discrepancy in the present state of research and addresses the request of other researchers to focus on performance as a consequence of control by asking:[65]

1. *Which management control forms have the strongest performance effect on SMEs?*[66]

Closely interconnected with understanding the effectiveness of controls in SMEs is the question of addressing the effect of corporate life cycle on management control. MCS researchers in young firms provide findings on practices and adoption scenarios but fall short on providing evidence for the actual differences between start-ups and established organizations. For instance, the well-recognized researchers DAVILA/FOSTER (2007), in their study on speed of adoption and contingent factors, focused solely on early-stage organizations with an age up to five years.[67] While investigating initial MCS and its suitability for organizational strategy in young retail chains (younger than 20 years), SANDINO (2007) fails to determine if the choice of one particular MCS is as well associated with the company age or growth in size.[68] The author of this study argues that previous researchers, without comparing the actual differences of MCS associated with age, fall short on determining actual differences of young organizations from established organizations.[69] This study, therefore, specifically aims at closing this research gap by comparing the performance effects between young and established organizations and, therefore, asks:

2. *What is the difference in the performance effect of management control between young and established small and medium organizations?*

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64 Cf. the survey specifically asks if certain MCS are adopted or not (yes vs. no).

65 From a general perspective asked, for example, by Otley (1980), p. 423 or Schäffer (2001), p. 4.

66 Previous research, like the work of Ouchi (1979), shows that direct controls such as results and behavior control are highly contingent on the preconditions of task programmability and outcome measurability. As this finding can be assumed to be settled, the indirect forms of control are by far more interesting, as they promise to be of a rather best-practice nature. Therefore, this study will not evaluate any antecendents on controls, but focus solely on the direct, universalistic effects of management control.

67 Cf. Davila/Foster (2007), p. 914.

68 Cf. Sandino (2007), p. 270.

69 By considering the implicit assumption of other researchers, this study actually admits that contingency theory could be valid in the context of management control. However, at this point the nature of control is open (universal vs. contingency nature, as stated in Chapter 1.2) and will be determined further with the fourth research question.

Another important aspect in the application of management controls is the question of interaction between the different control forms (*control combinations*). Historically, researchers have examined one type of control in isolation[70] or investigated the effects of controls on psychological outcomes of managers.[71] For example, an organization typically chooses only one strategic orientation at a time. In contrast, controls are selected by the management based on internal and external factors and are in general used in combination with other control forms. Already ANTHONY (1952) proposed to investigate combinations of control to capture the full impact of management controls.[72] Previous research on control combinations, however, focused mainly on the functional context of sales & marketing employees, while other functional areas (e.g. R&D, general management or manufacturing) were neglected.[73] JAWORSKI ET AL. (1993) found that at least in sales and marketing context, high control systems (high levels of formal and informal controls) are associated with the highest levels of job satisfaction.[74] In addition to this finding, CRAVENS ET AL. (2004) pointed out that high control systems (in the previous meaning) are associated also with stronger performance, increased job-satisfaction, lower burn-out rates and decreased role-stress in comparison to other control combinations.[75] Recent research supports the importance of investigating investigating controls in packages again.[76]

In line with BALDAUF ET AL. (2005) and responding to his call for further study of "the appropriate blend of control dimensions"[77], this study aims at providing more insight into control combinations in the area of general management.[78] Two key questions emerge from the discussion. The first is, how do companies typically configure their control systems and does this have any effect on company performance? To address this research gap, this study will investigate both the usage and performance consequences of management control combinations in SMEs and, hence, asks:

3. *Which management control combinations are used in SMEs and what combinations are most beneficial for SMEs?*

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70 Cf. for example Ouchi (1979); Thompson (1967).
71 Cf. for example Otley (1978); Swieringa/Moncur (1972).
72 Cf. Anthony (1952), taken from Jaworski et al. (1993), p. 57.
73 To the best of the author's knowledge, only Jaworski et al. (1993) and Cravens et al. (2004a) cover the topic of management control combinations in the field of marketing.
74 Cf. Jaworski et al. (1993), p. 66.
75 Cf. Cravens et al. (2004a).
76 Cf. Malmi/Brown (2008), p. 287.
77 Baldauf et al. (2005), p. 22.
78 Cf. Collier (2005) specifically addressing the 'links' between the various forms of control (pp. 336-337) and Kreutzer (2008) calling for a broader MCS conceptualization and a rather configurational approach of MCS (p. 1.).

Finally, this study considers various moderators of the control-performance relationship and their impact on control form effectiveness. By doing so it also addresses the unresolved issue of the nature of control. As described in Chapter 1.2, the universal and the contingent perspective of control are both supported by researchers; however, the final solution has not emerged yet. This study aims at contributing to this discussion by contrasting both natures of control empirically. As previous research also investigated certain contingent factors and as this study intends to tie in with previous studies, the author chose to take certain contingent factors like size, age and management experience into consideration as well and asks:

4. *Which environmental factors moderate the effectiveness of management control forms?*

The first and the second research questions address the direct effects of management control in SMEs and how they actually differ with respect to company age. Research question number three addresses how controls are combined and what their performance consequences are. The interaction effects of internal and external factors with the management control consequences form the thrust area of research question four. All four research questions are summarized in Figure 1.

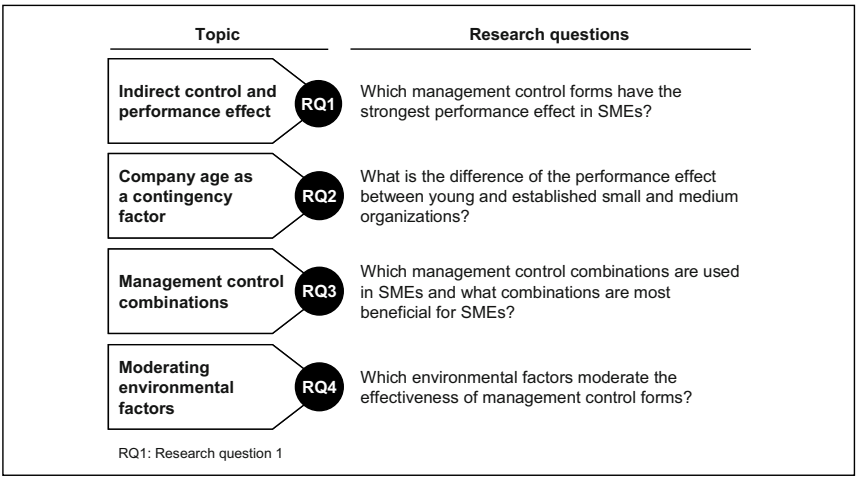

Figure 1: Research questions of the dissertation[79]

[79] Own illustration.

1.4 Structure of this study

The basic approach of this study is related closely to the research targets as outlined above. In order to provide empirical evidence for the suggested relationships, this study uses a confirmatory research methodology that builds upon hypotheses, derived from theory and previous research. The core part of this study is, therefore, the conceptual foundation and empirical validation of direct and moderated effects of management control forms in SMEs.

Chapter 2 summarizes the conceptual foundations of this study. First, the two key research objects of this study, SMEs and management control, are defined and differentiated from other terms. Second, basic concepts of management control are presented and a research framework of controls is selected to be analyzed in this study. The chapter closes with a summary of the liabilities of SMEs and their effect on management control in the organizations.

Chapter 3 discusses the theoretical framework of this study. In order to predict the performance effects of management control forms, a broad range of theories are evaluated in terms of their applicability to this research project. Finally, both selected theories are presented and described in terms of their application to the research questions.

The research model for this study is presented in Chapter 4. Hypotheses are developed using the conceptual foundations of Chapter 2 in combination with the theoretical foundations from Chapter 3. The assumed direct effects of management control forms are developed first, followed by the consequences control combinations and finally the investigation of moderating factors.

Chapter 5 starts off with the choice for the analytical methodology – structural equation modeling using the partial-least-square approach – and describes its underlying statistical concepts. It ends with a summary of the measurement instruments employed and their specifications.

The preparation and data analysis of the survey are the main contents of Chapter 6. After describing the method of data generation with an online survey, the data sets are tested for representativeness, evaluated in terms of their data quality and assessed for potential biases. Finally, the required significance levels for the confirmatory approach are determined.

Chapter 7 presents the empirical results of the study. First, the measures are tested for reliability and validity, followed by formal hypotheses testing of the direct effects of management control. The confirmatory analysis of control combinations is complemented by the study of moderating factors such as age and size on the control effectiveness.

Finally, Chapter 8 discusses the empirical results and derives implications for researchers and managers. Potential restrictions of this study are discussed and avenues for further research are detailed. The chapter closes with a summary of the overall study and its findings.

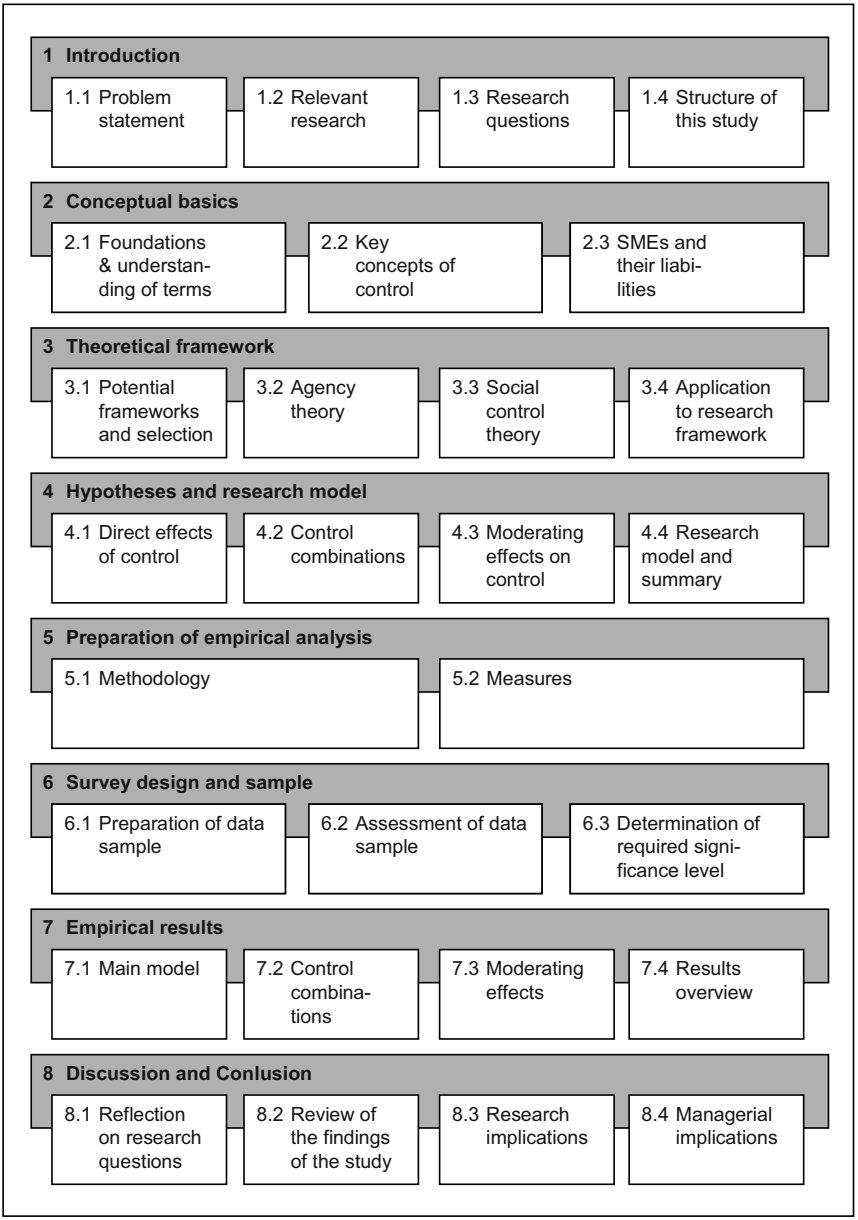

Table 2: Structure of this study[80]

[80] Own illustration.

2 Conceptual basics

This chapter reviews the conceptual terms used in this study. In Chapter 2.1 the term of management control is defined and distinguished from other related theoretical concepts. The concept of control is then described (Chapter 2.2), followed by a review of the liabilities of SMEs in relation to management control (Chapter 2.3).

2.1 Foundations and understanding of terms

The key research objective of this study is to determine the effects of management control on the company performance in SMEs. In order to provide a solid terminology in this study, this chapter provides an overview on the understanding of the two key terms 'management control' (Chapter 2.1.1) and 'SMEs' (Chapter 2.1.2) employed in this study. The term 'management control' is finally contrasted with other related terms in Chapter 2.1.3 to avoid potential misunderstandings.

2.1.1 Management control

Due to its fundamental importance for this study, the term 'management control' is defined in this section. Various notions and meanings of the term 'control' exist in the literature. The Encyclopaedia Britannica, for example, defines a control system as the "means by which a variable quantity or set of variable quantities is made to conform to a prescribed norm. It either holds the values of the controlled quantities constant or causes them to vary in a prescribed way."[81] Typically, the term 'control' carries a strong negative connotation, specifically in a society and organizations that are proud of their intense social relationships and trust.[82] Synonyms of the term and words and phrases similar to it include command, dominate, direct, steer, pilot, hold, sway over, rule, exercise power or authority over, govern, manage, lead, conduct, call the tune, guide, oversee, supervise, check, hold back, curb and repress.[83]

The review of RATHE (1960) lists a total of 57 different meanings[84] of the term 'control' in the Anglo-American literature ranging from 'prohibit' to 'manipulate', and, therefore, concludes that the term 'control', "as it applies to a management function, does not have a universally accepted definition."[85] The very large number of different meanings and interpretations lead to a vast amount of different definitions and understandings of 'control'. This study

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81 Cf. online platform of Encyclopedia Brittannica, Academic edition, accessed 4.11.2008.
82 Cf. Collier (2005), p. 323.
83 Cf. Collier (2005), p. 323.
84 Cf. Rathe (1960), p. 32. He adds that control is considered to be "one of the thorniest problems of management." p. 30.
85 Merchant/Stede (2003), p. 4.

presents three relevant conceptual approaches, as they cover all the relevant scope that is currently attributed to the term in the academic field.

First, control, in its most fundamental meaning, refers to the pure comparison of two figures.[86] In this context, control is understood as a comparison of one figure with a goal, target, norm or historic figure to reveal deviations. The two figures, however, have to be conceptually different from each other[87] and both have to rely on a common base for comparison.[88]

Second, building on systems and cybernetics theory, control is considered as an element within a control cycle: the first element of the cycle is the anticipation/planning; the action is then executed by an individual and pursued by a control activity. The difference between anticipated and executed activity is then evaluated and the results are used for feed-back, depending on the source of deviation, into one of the two prior process steps.[89] Important in this model is the feedback loop that relates the outcome of one action to the following or another control cycle. In the simple model of a thermostat, the desired temperature is determined (anticipation/planning), the heater then adjusts the heat flow up or down (execution) and the actual room temperature is then measured against the defined temperature (control). Finally, heating or cooling is initiated to match the desired temperature.[90] Systems theory also discusses the feed-forward process: instead of initiating ex-post corrective actions, it adjusts input factors to the process to ensure anticipated results beforehand.[91]

Third, a dominant group of researchers, especially in the Anglo-American literature, refer to the term control as the combination of steering, monitoring and execution.[92]

- MERCHANT (1985) summarizes that "control . . . means essentially keeping things on track."[93] For him, the key purpose of control is to influence "proper behaviors of the people in the organization."[94] In his conceptualization he specifically stresses the importance of proactive controls, such as direct supervision, employee hiring

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86 Cf. Kienzle (1931), p. 1; Schnutenhaus (1951), p. 64; Hasenack (1952), p. 339; Nordsieck (1955), p. 37; Kosiol (1962), p. 56; Grochla (1978), pp. 315-316.

87 The comparison of two identical figures (e.g. sales 2008 vs. sales 2008) is not considered a control activity.

88 Cf. According to Diemer (1962), p. 457, there are three required criteria: first, two objects of comparison have to be present; second, both have to be different; and, finally, a common topic has to be described by both figures. Refer also to Brettel (2006), p. 17.

89 Cf. Kirsch (1971), pp. 85-86.

90 Cf. Merchant/Stede (2003), p. 4.

91 Cf. Schäffer (2001), pp. 17-18.

92 In this sense refer also to: Anthony (1965), p. 17; Davis (1969), pp. 625-627; Flamholtz (1979), p. 51; Flamholtz et al. (1985), pp. 35-36; Das/Teng (1998), p. 508; Schäffer (2001), pp. 20-21; Merchant/Stede (2003), p. 3.

93 Merchant (1985a), p. 1.

94 Merchant (1985a), p. 4.

standards or codes of conduct, in comparison to reactive controls as described in the approaches above.[95]

- In a similar notion, TANNENBAUM also includes the notion of execution and proactive implementation of countermeasures in his understanding of control. "Its [control, J.H.] original application in business organizations derives from the French usage meaning to check. It is now commonly used in a broader sense synonymously with the notions of influence and power. We shall use the term in this way to refer to any process in which a person or group of persons or organizations of persons determines, that is, intentionally affects, the behavior of another person, group, or organization."[96]

This study builds on the third approach, control as a combination of steering, monitoring and execution, when investigating control consequences in SMEs. The rationale for this selection is the focus on indirect controls. Indirect controls like personnel selection, implementing social controls or cultural control measures alter the working environment of employees instead of influencing the work process itself. The first two approaches, however, view control rather as a mechanistic element in the work process and hence could not integrate the approach as focused in this thesis.

Research level: in relation to the level of control usage, three key areas of control can be distinguished:

- *Strategic control* determines the retrograde validity of a chosen business strategy[97] and determines if it needs to be adopted as a result of, for instance, changed competitive dynamics.[98] Strategic control is typically conducted by and executed within the top-management team by using strategy reviews or projects.
- *Management control* is the "process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organization's objectives."[99] Also, it ensures that strategies and plans are implemented. Typically, managers execute this form of control to ensure that their subordinates implement actions as planned.
- *Operational control* is typically referred to as "the process of assuring that specific tasks are carried out effectively and efficiently."[100] It is focused on tasks (e.g. manufacturing Job No. 5687; ordering 500 units of Item 84261), in contrast to management control that is concerned with individuals.[101] Operational control is conducted with IT systems or between the lower levels of the organization.

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95 Cf. Merchant/Stede (2003), p. 4.
96 Tannenbaum (1968), p. 5.
97 Cf. Schreyoegg/Steinmann (1987), p. 91; Steinmann/Schreyögg (2005), pp. 274-277.
98 Cf. Merchant/Stede (2003), pp. 6-7.
99 Anthony (1965), p. 17.
100 Anthony (1965), p. 18.
101 Cf. Anthony (1965), p. 18.

As the starting point of this thesis was to ensure the implementation of plans and to control subordinates, this study selects management control and the level of management-employee interaction as the primary concern.

To sum up, this study builds on a rather broad and behavioral definition of control that subsumes all techniques ensuring that the behavior and decisions of employees are consistent with the organization's objectives and strategies.[102] The corresponding German translation for the definition of control is 'Steuerung, Durchsetzung und Kontrolle.'[103] In terms of its research level, this study focuses on the level of management control in contrast to strategic or operational control, as it addresses techniques to ensure strategy implementation, which is an important element of the managerial day-to-day activities and is comparable across different organizations. During the course of this study, the individual types and techniques of control are referred to as management control forms and the overall system is referred to as an MCS.[104]

2.1.2 Small and medium sized enterprises

Small and medium sized enterprises (SMEs) play a significant role in the European and, especially, the German economy: 99.5% of all enterprises in Germany fall in the category of SMEs and they employ 60.1% of the overall German workforce.[105] But their importance is not limited to Europe: US SMEs contribute half of the US gross domestic product (GDP) and generate over 14 times more patents (per employee) than large firms.[106] Quite significantly, SMEs with a high degree of innovativeness, as covered in this study, create a considerable number of skilled jobs, support the structural transformation of national economies and ensure their sustainable competitiveness.[107]

As discussed in Chapter 1.1, while providing an ideal research object to understand the effects of indirect controls, SMEs are important to the German and European societies. SMEs are defined along four key characteristics, to ensure a common understanding of the term. First, referring to GUTENBERG, this study exclusively considers profit-oriented, private held

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102 Cf. Merchant/Otley (2006), p. 785.
103 Schäffer (2001), p. 20.
104 Cf. Merchant/Stede (2003), p. 4.
105 Cf. Eurostat (2008). The employment effect within the European Union is comparable: SMEs represented 99.8 % of all EU-27 enterprises in the non-financial business economy in 2004, employing two thirds of the workforce (66.7 %) and generating half of total value added (56.9 %); in all there are 19.6 million SMEs in Europe.
106 Cf. Ibrahim et al. (2004), p. 52; US. Small Business Administration (2003).
107 For further information in relation to the societal effects like creation of job positions, tax effects and investments of SMEs, see Sherman (1999), pp. 125-129; Ridinger (1997), pp. 13-15; and Paulini (1997), pp. 27-29. Further details can be found in Siebert/Lorz (2007), pp. 180-181; Jung (2004), p. 8; Almus (2000), p. 1 and Heil (1999), pp. 47-49.

business.[108] Other organizations, such as non-profit organizations or public entities, are left out of consideration as they pursue significantly differing goals and strategies.[109]

Besides their ownership structure, the number of employees is also a parameter contributing to the definition of SMEs.[110] Although numerous classification schemes with similar name classes exist, the classification landscape for SMEs is rather heterogeneous.[111] Numerous size patterns have been developed and they now rather coexist. In order to build on a commonly adopted size structure, this study employs the classification scheme of the Statistical Office of the European Community, Eurostat.[112]
The classification of Eurostat builds on four distinguished classes of organizations:[113]

- *Micro enterprises:* less than 10 persons employed
- *Small enterprises:* 10-49 persons employed
- *Medium-sized enterprises:* 50-249 persons employed
- *Large enterprises:* 250 or more persons employed

In order to come to one commonly accepted term for SMEs, Eurostat refers to SMEs as organizations ranging from one to 249 employed persons. Consequently, this study uses the definition based on the organization's size, the definition followed by the European Union, and also employed by numerous local and international researchers. As management control is executed wherever a manager interacts with an employee, even within micro-enterprises with less than 10 employees, this study will focus on the effects of control in organizations having 2 to 249 employees.

The third criterion restricts the focus to organizations that were founded by independent individuals, i.e., not founded by any other organization. According to that criterion, this study excludes SMEs that are spin-offs or were founded building on a previously existent organizational structure. Management control in the context of large organizations is associated with different characteristics in comparison to SMEs. Due to a strong general

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108 Cf. Gutenberg (1983), pp. 457-459.
109 Cf. Claas (2006), p. 41.
110 Besides the definition based on number of employees, the classification also builds on the volume of revenues (smaller than €50M) and balance sheet total assets (smaller than €43M). The assignment of a company to one class is based on all three characteristics. Once an indicator is above the threshold, the organization is automatically recognized as not being an SME any more. Pichler (1997), p. 13.
111 Cf. Betge (1993), p. 4272.
112 The primary objective of the classification of Eurostat is the determination of organizational size classes to determine subsidies assignment and development of support programs for SMEs. "These definitions are important when assessing which enterprises may benefit from EU funding programmes aimed at promoting SMEs, as well as in relation to certain policies such as SME-specific competition rules."
113 Cf. Eurostat (2008).

resource base, MCS are more sophisticated, formal, direct and typically dominated by IT systems.[114] By restricting the study to independent SMEs, the researcher ensures the coverage of typical SME MCSs without any influence or input from large organizations MCSs.

Finally, the fourth criterion restricts the study to innovative SMEs. This permits generalizations of this study to support the economic development of SMEs in Germany, as innovative SMEs are associated with the highest growth potential and concordant growth in employment.[115] To determine the level of innovativeness, this study builds on specific industry sectors, ranging from IT, engineering, and automotive industry to bio-technology, sectors that are known to be highly innovative and promise high general growth rates.[116] This approach explicitly excludes pure self-employed activities such as facility managers, hairdressers or shoemakers from this study.

In conclusion, this study chooses profit-oriented small and medium sized organizations with up to 249 employees as its research object. Only organizations that were founded independently by individuals and are not part of a larger organization or spin-offs are selected for this research. This approach ensures the existence of a typical SME-MCS without any biases due to a potential affiliation with larger sized enterprises. In addition to the size aspect, only SMEs from innovative industries are considered in this study. During the remainder of this study the research object is referred to solely as SMEs.

2.1.3 Distinction of management control from other terms

Finally, control needs to be differentiated from similar terms, as they are frequently not distinguished adequately in the literature. In the following section, control is distinguished from the terms controlling, planning and performance measurement.

Controlling.[117] "The controller does not control."[118] This simple but passionate statement highlights an extensive discussion. Due to the common etymological foundations of both terms, controlling being the progressive form of control, both terms suffer from misinterpretations and other conceptual inconsistencies.[119] Especially the unreflected usage of

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[114] For a discussion refer to Chapter 2.3.
[115] Cf. Licht/Nerlinger (1998), p. 1005; Claas (2006), pp. 170-171.
[116] As defined by the Fraunhofer institute ISI Grupp/Legler (2000).
[117] In the Anglo-American literature typically referred to as 'Management Accounting.'
[118] In the original German text "Der Controller ist kein Kontrolleur!" Schäffer (2001), p. 23.
[119] Sjurts (1995), p. 3, explains the misunderstanding resulting from the usage of the continuous form of 'controlling' of the infinitive 'to control.' "So werden amerikanische Arbeiten zur Kontrolle (Control), die dabei naturgemäß das Wort 'Controlling' als Verlaufsform verwenden, immer wieder unzutreffend zur Konzeptionalisierung bzw. Begründung deutscher Überlegungen Controllingfunktion herangezogen."

the term control with the meaning of controlling or vice versa is apparent in numerous literature articles.[120] SCHÄFFER (2001) states that this non-stringent usage of terms is also related to the reluctance of controllers to be associated with the unpopular function of control.[121] In the currently well adopted German rationality oriented approach of controlling, ('Controlling als Rationalitätssicherung des Managements') control is one of the key management functions that are coordinated and supported by the controlling department.[122] This study takes a slightly different perspective which is also aligned with that expressed by other researchers.[123] It defines control as one of the key activities of management and hence assumes it to be a function that is executed by the individual manager, rather than a corporate function.[124] Controlling in the context of the study is a centralized function, located in a separate department or represented by a responsible individual that assists managers to efficiently conduct control. Hence, both functions are interrelated but can be clearly differentiated.[125]

Planning. Planning and control are terms that are frequently used in conjunction.[126] In traditional management cycles, control succeeds planning to ensure that the planned activities are actually implemented.[127] Various scholars discuss if control and planning can be considered as separate management functions or if they are interconnected in such way that they are inseparable.[128] A typical perception concerning this question is that planning is meaningless without control while control is not possible without any planning.[129] STEINMANN/SCHREYÖGG, keeping this perspective, also refer to control and planning as 'sister functions': control without any target values from a previous planning is not meaningful; at the same time, a new planning cycle cannot start without information from a previous control

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120 Even well known authors like Weber (1991) happen to mix up both concepts. In a listing of controlling related definitions, Rathe (1960) is cited, although Rathe specifically considers the management function of control; Hinterhuber (1990), p. 92, similarly cites Goold/Quinn (1990) in a context of strategic controlling, while Goold/Quinn (1990) wrote a paper on "The paradox of strategic control", namely a control function.

121 Cf. Schäffer (2001), p. 23.

122 Cf. Weber/Schäffer (2006), pp. 232-233; the approach was further developed by Ahn/Dyckhoff (2004) who, in particular, detailed the approach in regard to the application on all organizational levels and the underlying management process. Cf. Ahn/Dyckhoff (2004), pp. 504-515.

123 Cf. for example Merchant/Stede (2003), p. 4.

124 As pointed out in detail during Chapter 2.1.1.

125 However, by moderating the long-term planning process or ensuring the availability of plan and actual data, the corporate function of controlling supports the execution of control heavily, but differ significantly in its target: while control aims at changing the individual's behavior in his or her interaction with the superior, controlling ensures and supports managers to do so.

126 Cf. Grünig (2002), p. 28.

127 Cf. Grünig (2002), p. 27; for a cybernetic management cycle model see Küpper (2005), p. 201.

128 Cf. Wall (1999), p. 21.

129 Cf. for example Wild (1974), p. 44.

cycle.[130] Although intuitively correct, this assumption does not hold true for at least two cases:[131]

- In the case of results controls, a typical approach is to control against performance or measures of industry-performance (benchmarks) or the success of other subsidiaries. In this case, a planning activity would not deliver any additional value to the control process.[132]
- Control also does not rely on planning in the case of behavior control: in this control form, managers compare the behavior of people (e.g. in a team work situation) against implicit behavioral expectations. A planning in the sense of a predetermined outcome is not required there.

Building on these considerations, this study assumes that control and planning are actually two important management functions that share important connection points, but also that they are separable. Consequently, planning outcomes will serve as a foundation for certain control forms but will not be reflected explicitly in the research model of this study.[133]

Performance measurement is primarily concerned with the process of quantifying the efficiency in various dimensions and is a part of the overall topic of performance management.[134] Important aspects are the development of measures and performance indicators as well as the design and implementation of such systems. A well known concept in the context of performance measurement is the concept of a balanced scorecard by KAPLAN/NORTON and the associated literature.[135] As described in 1.1, management control aims at describing the mechanisms to influence organizational behavior in general and provides the relevant controls. Performance measurement, in contrast, differs from management control by its focus on quantification and visualization of performance.[136] However, techniques from performance measurement could be used in management control as well, e.g., using a balanced scorecard to monitor outcomes or process performance.

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130 Cf. Steinmann/Schreyögg (2005), p. 12.

131 However, there are different control situations, where control bases on planning outcomes. The examples are used only to illustrate the shortage of the claim that control solely bases on planning.

132 Cf. Küpper/Weber (1997), p. 177 and p. 180.

133 This approach is fully in agreement with that of the other researchers in the field of management control. For example, Merchant (1985a), p. 3, says: "To limit the scope of this book slightly, control is discussed with the assumption that the objectives of the organizations in question have already been decided upon. Knowledge of objectives is a necessary prerequisite for conscious control efforts, as without it, activity can only be described as aimless." It is also in line with other researchers on controlling like Küpper (2005), p. 200.

134 Cf. Charnes et al. (1978), p. 429; Eccles (1991), p. 132; Neely (2005), p. 1266.

135 Cf. for example Kaplan/Norton (1992); Kaplan/Norton (1996); Kaplan/Norton (2008).

136 Cf. Neely et al. (1995), p. 80.

Consequently, both concepts share certain elements, but have to be analyzed independently as they have different focus.

In summary, management control can be clearly distinguished from the terms outlined above despite their semantic proximity. In this study, controlling or planning activities are left out of consideration; however, elements or concepts from the adjacent research fields are used to develop the notion of management control.

2.2 Key concepts of management control and their applications

This section summarizes the key concepts of control and details important aspects for the further application in this study. First, the goals of a control system are discussed, key parameters are characterized and control is integrated into the overall concept of management (Chapter 2.2.1). Chapter 2.2.2 discusses potential research frameworks and the choice of one framework that can be used further in this study. Third, the various control combinations are reviewed in relation to their relevance and potential effects (Chapter 2.2.3). Finally, Chapter 2.2.4 discusses organizational performance as a consequence of control. Despite the relevance of the direct effect of controls on company performance, contingent factors are expected to moderate the control-performance relationship; hence they are presented as well.

2.2.1 Control strategies

Despite the intuitiveness of the term control and due to the frequent usage in colloquial language, it is a rather complex term and understood quite heterogeneously.[137] Before describing the chosen framework for this study, this chapter summarizes the fundamental characteristics of controls in organizations and provides an overview on the concept of control. First, Chapter 2.2.1.1 describes the potential goals for the application of management controls. Key parameters of a control system such as the relevant entities and their relationship are presented in Chapter 2.2.1.2. Finally, as control is considered an important managerial activity, it is integrated into the overall management cycle (Chapter 2.2.1.3).

2.2.1.1 Goals of a control system

Control systems have three fundamental goals: (i) to gather and convey information about desired targets to members of organizations, (ii) to influence individual and group behavior and (iii) to enable learning.

[137] Cf. Rathe (1960), p. 32.

Information is required to facilitate organizational decision-making processes. The availability of sufficient quantity, quality and relevant information can significantly increase the quality of decision-making.[138] Previous research demonstrated the relevance of control for providing information. ITTNER/LARCKER (1997) showed that the use of benchmarking techniques (i.e., the comparison of key performance indicators between companies) was associated with a superior company performance.[139] In a similar vein, YOUNG ET AL. (1998) showed that the aspect of information retrieval of a quality management system has an impact on performance as well.[140] On the other hand, control can also transmit information about desired activities and targets. Instead of only planning and proposing certain processes or results, the introduction of control elements illustrates their importance and relevance and raises awareness about them.

Influencing behavior is the second important goal of control. Due to the separation of decision-making and execution in organizations, managers are required to ensure that employees actually behave in a target-consistent way. Behavioral impact of control typically manifests in setting up explicit norms or standard processes;[141] other mechanisms include aspects of socialization and social processes.[142] Previous research shows that activities conducted in the presence of control are conducted conscientiously, accurately and sometimes even faster.[143] In the same sense, the Hawthorne experiments show that the mere presence of observers itself can influence the behavior of groups.[144]

SCHÄFFER (2001) extends the previous concept of control by incorporating the aspect of *learning*. He argues that control not only facilitates a learning process, but actually is a learning process by itself. The key goal of control in this concept is an increase of the individual's capabilities and an improved alignment of the activities with the desired results as defined by the control subject (e.g. the superior manager).[145] By integrating and combining cognitive and behavioral sciences, SCHÄFFER argues that, besides its documentary purpose, control fulfills two fundamental goals.[146] First, control has an impact on the control object (e.g. employee), which is also referred to as the *enforcement-function of control*.[147] Learning

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138 Cf. Laux (1979), pp. 249-250; Eisenhardt (1989b), pp. 567-571.
139 Cf. Ittner/Larcker (1997), p. 305.
140 Cf. Young et al. (1988), pp. 613-616.
141 Cf. Laux (2006), p. 8.
142 Cf. Laux (2006), p. 9.
143 Cf. Lysinski (1923).
144 The Hawthorne experiments investigate the impact of psychological factors on work performance. See Roethlisberger/Dickson (1939), pp. 379-381. For further discussion see Carey (1967) and Sonnenfeld (1985) also.
145 Cf. Schäffer (2001), p. 41.
146 Cf. Weber/Schäffer (2006), p. 233.
147 In German "Durchsetzungsfunktion der Kontrolle" Schäffer (2001), p. 42; Weber/Schäffer (2006), p. 233.

in this context occurs after conducting control, e.g., by observing and analyzing deviations but can also occur by anticipating control or the sole announcement of control.[148] Second, control also impacts the control subject by increasing its knowledge on target, execution and actual activities in the context of control (*learning-function of control*).[149] As the control subject executes control, it is increasingly able to understand targets and other contingencies relevant to the control process. The subject's learning can then be used for further control activities or other elements of the management process.

To sum up, different goals of control are discussed in the literature. However, the three goals are not necessarily mutually exclusive and can exist in conjunction with each other. For example, if control is considered as a means to address agency issues, control acts with the goal of providing information (overcome information asymmetry) and influence behavior (prevent opportunistic behavior) as well.[150] This study chose to adopt the goals of informational and behavioral aspects of management control, due to the specific research focus on management control in SMEs and the implementation of plans. Nevertheless, control has been shown to foster and influence learning in organizations, but that effect is not addressed further in this study and, therefore, it remains rather as an important notion than a key mechanism.

2.2.1.2 Parameters of a control system

The following chapter briefly summarizes the key parameters of an MCS. The purpose of this section is to illustrate key parameters which an MCS is typically associated with. Specifically, it covers the control subject (Chapter 2.2.1.2.1), the control object (Chapter 2.2.1.2.2), the relationship between subject and object (Chapter 2.2.1.2.3), the intensity level of control (Chapter 2.2.1.2.4) and the potential techniques to implement control in organizations (Chapter 2.2.1.2.5).

2.2.1.2.1 Control subject

Control subjects execute control in an organizational setting. They conduct the relevant control activities by employing specific control techniques.[151] Control subjects are typically visible, especially if control is conducted by superiors in direct interaction. Control subjects can also be invisible, for example, if social control is indirectly performed by other

[148] Cf. Schäffer (2001), p. 42.
[149] In German "Lernfunktion der Kontrolle" Schäffer (2001), p. 42; Weber/Schäffer (2006), p. 233.
[150] Cf. Sjurts (1995), p. 118.
[151] Cf. Müller (1980), p. 1088.

employees.[152] Another indirect form is the 'big-brother' type of control, in which an employee knows about the control activities, but cannot identify the controlling subject at all.

Control subjects in the context of organizations can be categorized into internal and external entities. Basically, all employees can be considered as potential *internal control subjects*. However, enterprises typically tend to entrust control with specialized organizational units or in the upper levels of the hierarchy.[153] As outlined in Chapter 2.1.1, the dominant entity expected or deputed to conduct control in organizations is the manager. Other potential entities are the employees themselves by conducting social controls, and dedicated organizational units such as the controlling or the revision department.[154] *External control entities* typically encompass the supervisory board, certified professional accountants (CPAs), and the owners of an enterprise.[155]

As outlined above, this study considers control to be a key function executed by managers to monitor their subordinates' conformity to the goals. A significant body of previous research focused attention on control subjects from a specific functional field, for instance, the area of research & development or sales & marketing.[156] However, although the results provide evidence for the applicability of specific forms of control, the generalizability of these results is limited. The way an engineer from the research department is controlled does not necessarily apply to a head of a department.[157] In order to address this research gap and to ensure generalizability, this study chose to investigate management control in the field of general management, namely the interaction between the CEO and his direct subordinates. By focusing on this setting application, this study seeks to make an additional contribution to the research on control subject.

2.2.1.2.2 Control object

Control objects are defined as the objects within the organization that control measures aim at gathering information on.[158] The term control object does not refer to a person, a working process or a machine, but rather to the type of information relevant to the control activity.[159]

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[152] Potential other forms encompass electronic control, using information technologies or mystery shopping activities. Refer further to Ball/Wilson (2000), p. 542; Stanton (2000), p. 86.

[153] Cf. Pfohl/Stölzle (1997), p. 193.

[154] Cf. for example Hansch (2006), p. 16.

[155] Besides the aforementioned external control subjects, there are numerous other external parties such as technical certification authorities or rating agencies. Refer also to Hansch (2006), p. 18.

[156] E.g., Davila (2000).

[157] Cf. Hiddemann (2007), pp. 129-131.

[158] Cf. Müller (1980), p. 1086.

[159] In colloquial language the term control object refers generally to the entity controlled. In organizations, the entities to be controlled range from employees and processes to documents and manufacturing machines. However, the consideration of which type of information should be

In the following sections, control objects will be distinguished by (i) nature of the information for the comparison and (ii) the focus of control either on results or the process.

Control horizon. As mentioned before, control builds on a comparison between different figures. In this context, typically actual, target and expected values are used. Actual values represent realized values, amounts or times.[160] Target values refer to desired standards and are regularly derived from a planning process.[161] Expected values are based on actual values, but take the expected future development of the value into consideration and, therefore, have a prognostic nature.[162]

2nd item / 1st item	Plan	Expected	Actual
Plan	Target control	Plan achievement control	Feedback control
Expected	-	Prognostic control	Assumptions control
Actual	-	-	Ex-post control

Figure 2: Potential control comparisons[163]

By combining the three potential sources for a comparison, six control pairs can be derived and they are summarized in Figure 2. A detailed description can, for example, be found in Wall (1999).[164] In essence, control can build on the comparison of different values and is not restricted to the sole comparison of target and actual values.[165]

Results, action and clan control. To gather information on control activities, action control and results control can be distinguished: results control ensures that the desired outcome is

controlled is common across all entities. This section, hence, discusses which types of information are used for the act of control rather than the entities controlled.

160 Cf. Küpper/Weber (1997), p. 180.
161 Cf. Frese (1968), p. 59; Rahn (2000), p. 392.
162 Cf. Hahn (1997), p. 431.
163 Own illustration adapted from Pfohl/Stölzle (1997), p. 76.
164 Cf. Hahn et al. (2002), p. 21.
165 Cf. Wall (1999), p. 21.

achieved at a specific point in time, while action control is concerned with the target achievement process itself.[166]

Depending on the observed timeframe, *results control* can be conducted during the execution of a process (control of intermediate results) or after its completion (final result control). A related management concept in this context is management-by-objectives (MBO), as presented by DRUCKER in his 1954 book *The Practice of Management*, which has its focus on commonly accepted objectives.[167] As results control only monitors the target achievement itself, the entity responsible for the target achievement gains a significant amount of freedom on how to achieve its target.[168] Specifically, when conducted on employees, this increase in individuals' freedom results in an efficiency increase for intrinsically motivated employees. On the other hand, for employees who rather depend on feedback and interaction with their superiors – potentially due to low skill levels or high risk aversion – this control form has a potentially negative effect.[169] In addition, the amount of information from results control is limited: by comparing the actual with the target value, one can only determine (i) if the target was met and (ii) by which amount it was achieved or missed. It specifically does not explain if a potential underperformance results from a personal failure or from environmental changes which could not be influenced by the responsible entity.

Action control can be distinguished by the type of monitored activity introduced into process control and behavior control. In case the process is automated or executed by a machine, it is referred to as process control. Action control is hence not focused on human behavior but frequently builds on technical processes as well. Monitoring activities in this context build on the observation of chemical, physical or information related measures and determine if the processes were conducted according to plan.[170] Despite the relevance of process control, especially in a technical or scientific environment, its application to managerial work is rather limited: numerous processes in organizations are carried out by human individuals and are not of a technical nature. Consequently, this study focuses on behavior control rather than on process control. Behavior control ensures that only those activities are carried out that are known to be beneficial for the organization.[171] SNELL (1992) also summarizes that "formal behavior control regulates the actions subordinates exhibit on the job. More generally, it structures the transformation process of work."[172]

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166 Cf. Müller (1980), p. 1068.
167 Cf. Drucker (1954), p. 119 and 121-136.
168 Cf. Ziegenbein (2002), p. 137.
169 Cf: Thieme (1982), pp. 182-183.
170 Cf. Betz (2002), p. 989.
171 Cf. Merchant/Stede (2003), p. 67.
172 Snell (1992), p. 294. and related findings of Ouchi (1977)

One of the benefits of behavior control is the direct and immediate interaction with the controlled entity. Besides the pure observation of the individual's behavior, it also allows gathering information on the individual's skill set and the effort put into the task.[173] This information can then be used for other purposes within the organization. Furthermore, as behavior control builds on a dedicated set of standards and rules, it is even expected to reduce the effects of uncertainty in organizations.[174] The most important prerequisite for the application is sufficient knowledge of the control subject on the transformation process itself, as this is required for a valid comparison.[175] The decision to utilize behavior control also entails certain disadvantages: by guiding and accompanying the control object behavior, control restricts its decision space. The individual is not able to self-determine the transformation or target achievement process any more. In particular, this form of control is typically disliked by individuals, or even is considered as a form of suspiciousness and potentially results in a lower performance.[176] Secondly, the control subject (e.g. superior manager) can potentially use this control form in a non-intended way, such as increasing his area of influence.[177] Finally, the costs of direct interaction of subject and object in the context of behavior control are significantly higher than the one related to results control.[178]

Decision between results control and action control. Despite the differences between results control and action control that were discussed above, one could argue that the boundaries of the two control forms potentially overlap. The question arises if both control forms can actually be distinguished from each other. The empirical research of OUCHI reveals specific differences and concludes that both control forms are beneficial for specific situations.[179] In his work on the design of organizational control mechanisms, OUCHI presents a model on how to apply results control or behavior control to an organization. As OUCHI focuses on the activities of employees, he considers only the behavior control in detail.

To do so, he proposes two major dimensions. Firstly, the desired outputs must be measurable and the measurement itself has to have a reasonable precision. This characteristic is referred to as the 'output measurability,' which requires that the outcome can be observed at all or measured with appropriate control costs. Secondly, the decision should be based on the ability to understand the transformation process itself. In order to set up certain rules for the control of actions, the control subject requires information about the process. In a highly specialized process, for instance, the research and development of a high-tech coating, a superior manager

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173 Cf. Snell (1992), p. 294.
174 Cf. Ouchi (1978), p. 175.
175 Cf. Ouchi (1977), p. 97; Merchant (1985a), p. 33.
176 Cf. Thieme (1982), p. 182; Pfohl/Stölzle (1997), p. 245.
177 Cf. Thieme (1982), p. 182.
178 Cf. Eisenhardt (1989a), p. 136; Snell (1992), p. 295.
179 Cf. Ouchi (1977), Ouchi (1978), Ouchi (1979).

only has limited knowledge on the process (assuming no previous experience in this specific field).

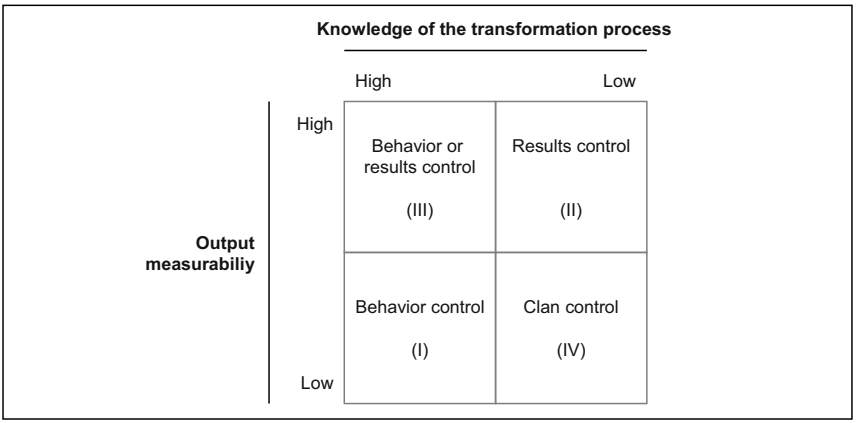

Figure 3: Choice between results and behavior control[180]

Based on the specification of the two dimensions, OUCHI distinguishes four different scenarios and recommends specific control forms. The selection method is summarized in Figure 3.[181]

Both the applicability and usage of results and behavior control has been reviewed by researchers before. However, as outlined in Chapter 1.2, the rather 'soft' forms of indirect control are increasingly gaining attention. Despite their relevance for SMEs with their informal organizational structure, they have only seldom been reviewed.[182] In order to address the deficiency of existing research, this study explicitly investigates the effects of both direct and indirect control forms in SMEs.

2.2.1.2.3 Control relationships

Based on the relationship between the control subject and the control object, researchers typically distinguish two important forms of control: self-control and external control. In case there is a personal union of the controller and the controlled, researchers consider it as self-control. In the cybernetic model of control, self-control integrates the execution and the monitoring of the process/result in one person. Conversely, external control refers to a

[180] Own illustration building on Ouchi (1979), p. 843.
[181] For the orginial considerations and a full overview, see Ouchi (1979), pp. 843-844.
[182] As outlined in Chapter 2.1.2.

situation when control is executed by a subject which is not related to the execution.[183] Although the distinction seems to be clear from a conceptual point of view, the unambiguous assignment of control forms to one of the two groups is rather difficult. Even though the pure forms do not exist, a discussion can build on a tendency towards one of the two models. Due to this nature of control, group control as a hybrid form of both self and external control is presented as well.

Self-control is control with only one protagonist: The self-controlling person takes over the responsibility of target setting, the process of execution and the comparison against the targets as well. In the case of a target misachievement the person punishes himself or rewards himself in the case of target achievement. Typically, targets are derived based on three sources: their previous performance level, the performance level of persons in their environment and the socially accepted minimum performance level. Following the mechanistic or cybernetic concept of control, self-control is occasionally also referred to as self-regulation.[184] In comparison to external control, self-control gained increasing research interest only in the 1980s.[185]

External control builds on the separation of control object from control subject. By externalizing the act of comparison, one gains an increased level of neutrality and objectivity but at the same time this restricts the personal decision space of the controlled individual.[186] External control is the traditional form of control associated with direct controls and wihtin organizations where the control is typically executed by the management. On account of its frequent application in history, there is a growing interest in research that even investigates external control as a professional service. Such external services encompass quality certificates, weight loss programs or external credit ratings and their effect on organizations and individuals.[187]

Another form of external control refers to markets as the subject of control. *Market control* signifies the concept of a perfect market to control and uses it to ensure the validity of factors such as prices. In this concept, the market takes over the role of the control subject and determines the 'fair' value of a good. If a good is not priced adequately, for example, the

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183 Cf. Brettel (2006), p. 22.

184 "Cybernetic engineers attempted to advance the capabilities of machines by creating self-regulating control systems like those that are apparent in goal-driven individuals." Palmer/Pickett (1999), p. 18.

185 Cf. Manz et al. (1987), p. 4, in reference to earlier studies of Tannenbaum and Lawler.

186 Cf. Brettel (2006), p. 22.

187 By analyzing services ranging from weight-loss programs and external credit ratings to accident vehicle data analysis, she develops four alternative types of external controls (external control as a learning function, as signaling the persuasion of third parties, as a self-disciplinary action, as signaling the protection against third parties). Cf. Brettel (2006), pp. 180-193.

market reveals the imbalance and triggers an alternative transaction with a third party. A typical application is the usage of multiple tenders from different vendors for the purchasing of a good. The supervising manager is not required to control each step of his subordinate purchase agents but instead can rely on competitive forces to determine a minimal price for the good.[188]

Group control as a hybrid form. Control within autonomous work entities is also referred to as *group control*.[189] Such a form of control manifests itself in worker groups on the shop floor or in management groups that develop specific cross-functional projects further. The rationale for their implementation is an increased effectiveness in comparison to non-autonomous groups.[190] Within such a group, a third control relationship is prevalent: as groups are measured by their overall target achievement, each individual employee bears an interest in executing external control over the activities of other group members, as the employee is affected by their outcomes.[191] Simultaneously, as the individual aims at achieving the overall target, he is expected to control himself as well. As the mechanisms of control within groups are a combination of self and external control, it is also referred to as a hybrid from of control. The concept of group control is also associated with the concept of social control in which group members take over control activities over one another.

In the context of this study, management control is assumed to be a mixture of different kinds of control relationships: Although it focuses mainly on managers as the primary control subject, the understanding of management control in this thesis highlights that managers also initiate processes that induce self-control within the employees. In addition, by altering the norms and values of an organization, the manager also triggers certain forms of group controls. As all three control relationships are affected by the understanding of MCS in this study, the control relationships are not restricted or selected; rather, the concept of control relationships is used to illustrate the nature of different control forms.

2.2.1.2.4 Control intensity

Another important parameter of a control system is the intensity with which control is executed. It can be described by its frequency, duration, point in time and accuracy. Examples for controls with a low level of accuracy are controls which consider only target achievement in one dimension. In case the control also encompasses other types (e.g. behavior) or builds on an increased number of dimensions (e.g. multiple dimensions/key performance indicators), it is referred to as a more accurate control. Two fundamental archetypes of control intensity

188 Cf. Ouchi (1979), pp. 836-838.
189 Cf. Kirkman/Rosen (1999), p. 59.
190 Cf. Patchen (1962), p. 290; Kirkman/Rosen (1999), p. 66.
191 Cf. Rasker/Post (2000), p. 1170.

can be distinguished: full control encompasses activities with the maximum control intensity;[192] partial control relies on the usage of lower control intensity by, for instance, using only a sub-sample to select the objects to be controlled.[193]

Defining an optimal level of control is an important, but quite difficult task. Previous research failed to provide a best-practice model for this question without excessively restricting the contingent factors.[194] Generally speaking, the optimal level of control is taken to be the level at which the associated control costs over-compensate control benefits. However, both figures are difficult to be measured in an organizational setting. The costs of control consist of the costs for information retrieval of the manager and for the preparation effort of the controlled employee. Control benefit is composed from the decreased deviation of the executed function in relation to the originally developed plan and increased motivation of the employees.[195] Only seldom is the highest level of control intensity also associated with superior organizational effectiveness.[196] However, previous empirical research showed that an increase in control intensity also increases the organizational performance.[197]

As the adoption and implementation patterns in SMEs were previously determined, this study chose to determine the impact of an increase in control intensity further. This approach is also highly relevant for its practical application: once a manager realizes that the pure introduction of an MCS is beneficial for their organization, he is expected to enquire if an increase of usage intensity is also associated with benefits for his organization.

2.2.1.2.5 Control techniques

Mechanisms, techniques or tools are practical elements used to implement and enforce management control in organizations.[198] Numerous management techniques have previously been developed, for instance, in the context of controlling, TQM or HRM.[199] A vast number thereof can be used also in the context of management control. A thorough discussion on all individual tools would exceed the scope of this study. To illustrate the effects of specific

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192 Cf. Laux (1979), p. 282.
193 Cf. Weber (2002), pp. 351-353.
194 Cf. Laux (1979), p. 282; Weber (2002), pp. 351-353.
195 For a detailed discussion on the effects of control forms on principal and agent costs, refer to Chapter 4.1.
196 For a detailed analytical model of the control efforts for routine activities, please refer to Baetge/Schuppert (1991a) and Baetge/Schuppert (1991b).
197 Cf. Otley (1978), p. 146; Snell/Youndt (1995), pp. 728-729; Shields et al. (2000), pp. 197-198; Wijewardena/De Zoysa (2001), p. 362.
198 Despite numerous efforts by various researchers to define and delineate the terms against each other, there is no consistent definitions that distinguish the terms. Hence, this study will use these terms synonymously.
199 Cf. Malmi/Brown (2008), p. 288.

tools, the following section presents a selection of three alternative management techniques and discusses their consequences in the light of management control.

Budgeting uses a structured methodology to define upper limits for organizational expenses.[200] Typically integrated in a business plan or predictive planning, it can be used to control different levels of the organization like projects, groups or the entire organization as such. For example, within development-projects this is achieved by defining maximum levels of expenses for individual components. As a result, the employees are free to pursue the overall project goal, but are restricted in their maximum project spending. However, budgeting does not define any desired behaviors. Its sole purpose is the restriction of the maximum project spending.

The concept of *balanced scorecard* (BSC) uses both financial and non-financial performance measures in four dimensions to track organizational outcomes.[201] By using different dimensions and performance indicators, the BSC allows managers to monitor the activities from a holistic perspective. Hence the manager is able to identify threats at an early stage, control his subordinates, and to react to the critical challenges.

Selecting new employees in a structured process is the key concept of *recruitment policies*.[202] Development of a job profile, testing of psychological patterns and matching the candidate to the job profile do not aim at getting the best people, but the best-fitting people for the job-position. The application of recruitment and staff selection processes ensures that only those employees are hired who are most likely to behave in a way that is consistent with the organizational goals.

In essence, previously established management techniques from, for example, the field of controlling or HRM are used in the context of management control.[203] However, it is important to remember that they do not constitute management control but rather support the comprehensive concept of control by their application. In this sense, management control utilizes management techniques to influence behavior and gather information; however, they are not similar concepts and should not be confused with each other.[204]

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200 Merchant (1981), pp. 815-816.
201 Cf. Kaplan/Norton (1992), pp. 71-73; Kaplan/Norton (1996), pp. 2-3.
202 Cf. Deshpande/Golhar (1994), p. 50.
203 Cf. Hyvönen et al. (2008), p. 46.
204 For an overview on management techniques to achieve management control see also Bloom/Van Reenen (2007).

This study choose explicitly not to refer to individual tools, but rather aims at providing evidence for the effectiveness of different groups of controls (referred to as control forms), which are distinguished by the fundamental principles they address.

2.2.1.3 Integration into the management process

Management control has already been defined as a key activity of management (Chapter 2.1.1). Control aims at enabling efficient execution and implementation of activities. Therefore, it shares a relationship with other managerial activities. In this chapter, control will be related to other relevant activities in the management process. Three relevant configurations have emerged in the literature:[205] Figure 4 visualizes the potential configurations.

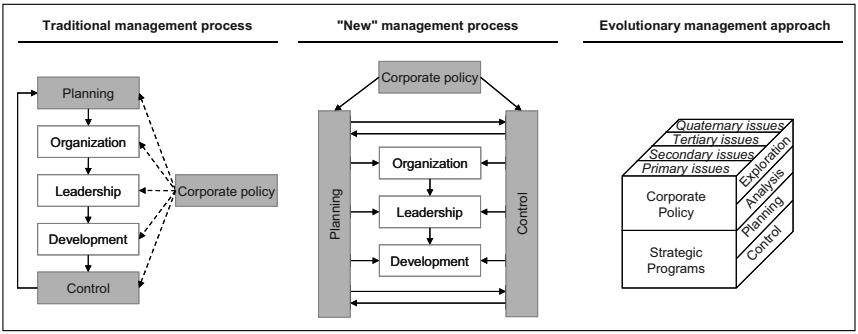

Figure 4: Management processes and the integration of control[206]

Control and its role in the three concepts are now briefly presented in order to point out the integration of control into the management process.

Traditional management process. The traditional management process builds on the primacy of planning. It is closely connected with the understanding of control as an element in a cybernetic control cycle.[207] All subsequent process steps build on the outcomes of planning and serve as means to implement it. Control in this context is understood solely as a function to detect potential/actual plan deviations and to initiate an adaptation.[208] Researchers have argued that this rather mechanistic view falls short of adjusting to the highly dynamic and

[205] Cf. Pfohl/Stölzle (1997), pp. 15-16.
[206] Own illustration adapted from Pfohl/Stölzle (1997), p. 17, 20 and 24.
[207] As described in Chapter 2.1.1.
[208] Adapation can result in an adjustment of plans (e.g. new sales targets for the upcoming week) or in an adaptation of activities to achieve the plan (e.g. increase of resources to meet the desired targets).

complex organizational reality and environment.[209] Similar conceptualizations of management have been developed by other scholars as well, for example, by WEBER/SCHÄFFER.[210]

New management process. The new management process model specifically overcomes the primacy of planning by adapting an understanding of planning as a selection function from the vast amount of information and planning available as a function of pre-control. Important contributors are STEINMANN/SCHREYÖGG.[211] Control in this process is understood as a means to reduce the system's inherent risk.[212] Firstly, it oversees, continuously monitors and interacts with planning activities to ensure planning efficiency and assumption control. Secondly, it constantly interacts with the execution process (organization, leadership and development) to reveal relevant risks. Control has a significantly larger responsibility and interaction with the remaining managerial activities in comparison to the prior management process.

Evolutionary management approach. Instead of being labeled a management process, this concept is considered as a management approach. The evolutionary approach manifests in the complex structure and the simultaneous potential for decomposition into dedicated managerial elements. The approach was primarily developed by KIRSCH and his students to develop a framework for the continuous transformation of an organization with a special focus on strategic management.[213] It can be broken down into three fundamental aspects: firstly, the operational functions can be distinguished into exploration, analysis, planning and control; secondly, the focus is distinguished by the level of abstraction into corporate policy and implemented strategic programs; and finally, the last dimension refers to four different problem areas within an organization.[214] The overall approach is a highly modular concept which ensures adaptability of strategic management to the organization and the environment.[215] Both planning and control are integrated in different dimensions of analysis, not merely in the process dimension. This overlap of concepts and integration into various areas is desired by the representatives of the evolutionary approach to demonstrate the strong interaction with other functions. In line with the new management process, the evolutionary

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209 Cf. Pfohl/Stölzle (1997), p. 18.

210 For the integration of control into the management process refer to Schäffer (2001), p. 46 or Weber/Schäffer (1999), pp. 207-210.

211 For a detailed overview on the concept refer to Steinmann/Schreyögg (2005), pp. 8-13.

212 Cf. Pfohl/Stölzle (1997), p. 19.

213 Cf. Kirsch (1990), pp. 330-355; refer also to his students: Kirsch et al. (1991); Ringlstetter/Knyphausen-Aufseß (1995).

214 Ranging from the availability of goods and services (primary issue), resources (secondary), and methods and techniques (tertiary issues) to stakeholder relationships (quaternary issues).

215 Cf. Pfohl/Stölzle (1997), p. 25.

approach does not build on the primacy of planning as well. An alternative contributor to the evolutionary management approach is MALIK with his 'St. Gallener Management Model.'[216]

This study considers control in its meaning provided by the new management process. The choice builds on two considerations. The first is the requirement of the management process to provide an understanding about how control is used in SMEs; the second, the need for the process to describe interdependencies between control and other management functions in order distinguish them.

In relation to the first criterion, control in this study's understanding interacts with all management functions and serves not solely as the basis for new planning activities. Hence, the rather sequential traditional management process does not apply to this research here. Although the evolutionary approach demonstrates the complex nature of control and its interdependencies, it fails to fulfill the second requirement. Instead of providing a framework on how control specifically interacts with other functions of management, the evolutionary approach is rather of a holistic nature. It assumes that all management functions are somehow interconnected and, therefore, fails to provide concrete insight for the application of control in this study. [217]

Hence, this study considers control as an essential part of the new management process. It continuously influences other management processes steps and does not build on a sequential understanding. However, its relevance for small business management lies in its interaction with the remaining management functions.

2.2.2 Research framework for management control

Theoretical considerations in the previous chapter describe the key elements, processes and actors of management control. However, instead of investigating the effects of the constituting elements, this study aims at providing evidence for the performance effects of different management control forms. Hence, the research framework employed in this study is required to cover the different relevant elements of management control in an exhaustive, but at the same time mutually exclusive, way. This chapter provides an overview of the potential research frameworks for management control. From the broad selection of frameworks available, this study presents six relevant frameworks. After defining the requirements and criteria for the selection, one framework is selected and presented in detail.

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[216] Cf. Malik (2000).

[217] Initially, the evolutionary approach was developed in the context of strategic management, but in course of time it migrated into the field of general management as well. In the opinion of the author, the approach is highly valuable, but too complex to serve as an understanding of control in SMEs. See also Kirsch (1990), pp. 330-355.

2.2.2.1 Overview of potential frameworks

A variety of structures to formalize management controls can be identified. They have been described by various authors as being, "for example, administrative, interpersonal, formal, unitary, intuitive, rigid, bureaucratic, meritocratic, and/or paternalistic, and these are very difficult to compare and contrast."[218] Depending on the notion of management control and the research strategy of the paper, the segmentations differ significantly across studies. The final framework has not emerged from the literature yet. However, a key concern of researchers is that the "variation in the number and type of controls that have been researched makes it difficult to develop a coherent body of knowledge."[219] Other disciplines like marketing research are far more advanced; when investigating, for instance, the concept of market orientation, the framework and key components are, to a large extent, standardized and can be applied across different studies. The comparability of results is increased significantly as a result of this. Instead of building a research set of management controls for this work, the author chose to build on an existing management control framework from the literature.

To structure the presentation of potential research frameworks, this study uses the underlying understanding of control in the specific frameworks. The first group of frameworks considers management control as a cybernetic process based on systems theory and is, therefore, referred to as the *systems-based approach*. [220] In contrast, the *alternative view of control* also integrates a social perspective by explicitly considering social interaction of group members in addition to the formal and structurally defined relationships.

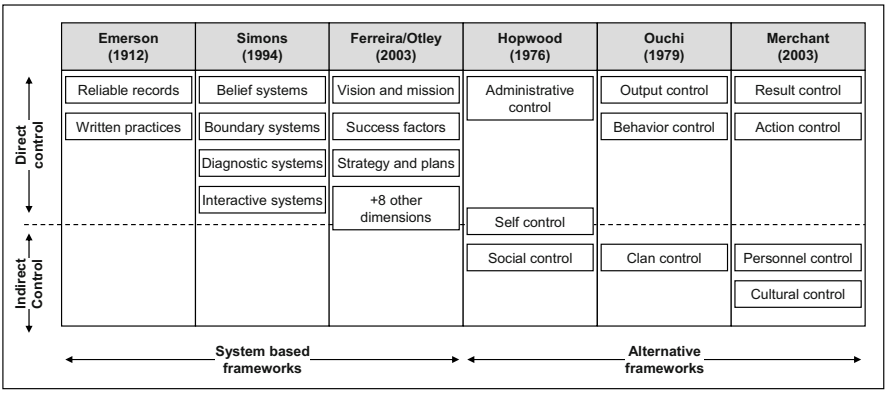

Figure 5: Overview of considered research frameworks[221]

[218] Merchant (1985a), p. 1.
[219] Langfield-Smith (1997), p. 226.
[220] For a summary refer further to Chapter 2.1.1.
[221] Own illustration.

In the context of *system based frameworks*, this study presents three frameworks, those of EMERSON, SIMONS and FERREIRA/OTLEY, which have gained considerable momentum in the area of MCS research.

2.2.2.1.1 System based views of control

EMERSON (1912), one of the first works in the context of control, did not specifically target the topic, but rather developed a framework that can also be applied to management control. In his book *The Twelve Principles of Efficiency* he proposes 12 principles for increasing efficiency in organizations. While the majority of the principles refer to the discipline of operational management, two principles specifically refer to management control or can be interpreted as two of the first proposals of controls for organizations: *Reliable records* and *written-standard practice instructions*.[222] The objective of *reliable records* for him is "to increase the scope and number of warnings, to give us more information than is usually received immediately through our senses."[223] EMERSON argues that *written standards* are especially useful if "advances are not only definitely recorded but when the best practice is carefully and systematically reduced to writing, progress made is held and built upon in an industrial plant or any other undertaking."[224] By this standardization, employees' decision space becomes limited and best-practice processes are established. Despite the general applicability of the approach, the selection of the principles by EMERSON IS rather vague, but it builds an interesting foundation for further work on management control.

SIMONS (1994) proposes four types of MCSs: belief systems, boundary systems, diagnostic control systems and interactive control systems. Managers use *belief systems* to define, communicate and implement key values and directions for the organization. *Boundary systems* set limits and process restrictions on the actions of employees. Potential techniques of a boundary system are explicit standards of execution or codes of conduct that are derived from the risk factors they try to mitigate. SIMONS also proposes the usage of *diagnostic control systems*. Diagnostic systems are considered as formal feedback systems that monitor results and correct deviations in comparison to specified standards of performance, such as business plans or budgets of key performance indicators (KPIs). Diagnostic systems are expected to restrict failure on key business dimensions but also bear the risk of simultaneously restricting innovation.[225] Finally, SIMONS describes *interactive control systems*

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[222] In his book, Emerson aims at deriving principles for effective organizations. Thereby, he develops a set of propositions that are still valid in today's business setting. Other principles encompass clearly defined ideals, common sense, competent counsel, discipline, the fair deal, dispatching, standards and schedules, standardized conditions, standardized operations and efficiency rewards. Refer further to Emerson (1912).

[223] Emerson (1912), p. 206.

[224] Emerson (1912), p. 331.

[225] Cf. Simons (1994), p. 91.

that are employed by managers to interact with subordinates on a regular and personal level during the decision-making process. Through regular meetings with their employees, managers strive to influence their behavior but at the same time generating stimulation, innovation and creative thinking with them. Although it is comprehensive in its structure, the framework lacks clarity; researchers criticize the "ambiguity between diagnostic and interactive, and challenge whether particular structures belong to belief or boundary systems."[226] Although partially covering social aspects in belief systems, SIMONS explicitly focuses on "formal-information based routines and procedures managers use to maintain or alter patterns of organizational activities" and, therefore, excludes informal mechanisms from his framework.[227]

In the context of management control, OTLEY (2003) proposes a new framework for management control analysis. He proposes five relevant dimensions for the analysis: (i) objectives, (ii) strategies and plans, (iii) targets, (iv) rewards and (v) feedback. However, in the opinion of the author of this study, the framework presents a framework for analysis, rather than a descriptive framework, and only extends management control marginally. OTLEY himself admits this himself when he admits that the "central issue in management control can be seen as remaining the same."[228] Building on the previous work of OTLEY (1999) and SIMONS (1994), FERREIRA/OTLEY (2003) develop the framework further. The framework consists of eleven elements and the links between the elements that contribute to the design of an overall MCS.[229] In line with the proposal of OTLEY (2003), he describes the dimensions of analysis rather than the elements of an MCS. Interestingly, both researchers intentionally exclude culture and other external factors from their overall framework; however, they acknowledge a potential impact on the effectiveness of control and integrate it as a contingent factor in their framework.[230]

The main criticism against the frameworks, especially against the latter two frameworks, is that they tend to underestimate and neglect the importance of socio-ideological forms of control.[231] Due to the importance of socio-ideological control forms for organizations, alternative frameworks explicitly address these mechanisms; three relevant frameworks of

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226 Collier (2005), p. 336.
227 Cf. Simons (1994), p. 5.
228 Otley (2003), p. 315.
229 The overall framework consists of the following elements: vision and mission; key success factors; strategy and plans; organization structure; key performance measures; performance targets; performance evaluation at individual, group and organizational levels; financial and non-financial rewards and penalties for achieving or not achieving performance targets; feedback and feedforward information flows; use made of the PMC system (interactive, diagnostic, or combination); changes in the PMC system in the light of organizational and environmental dynamics; and strength and coherence of links. Cf. Ferreira/Otley (2005), p. 53.
230 Cf. Ferreira/Otley (2005), p. 43.
231 Cf. Ditillo (2004), p. 402.

HOPWOOD, OUCHI and MERCHANT are, therefore, presented further for the application in this study.

2.2.2.1.2 Alternative frameworks to management control

HOPWOOD, in his 1976 work on accounting and human behavior, reflects on the changed role of the accountants in enterprises and the managerial use of their figures, while complementing the typical accountants' view with social relationships.[232] The proposed framework for control in organizations consists of traditional administrative control but that is complemented with social controls and self-controls. HOPWOOD defines *administrative controls* as "formal rules and standard procedures to regulate the behavior of subordinate managers and employees."[233] By constraining alternative behavioral patterns, the predictability of actions is increased. In contrast to administrative controls, he also includes the concept of *social control*.[234] In his proposed framework both administrative and social controls are interacting with the third form of control, *self-control*.[235] Although covering important components of a control system, the framework lacks a practical application. Instead of describing mechanisms and organizational controls, it merely describes different positions, from which an MCS in an organization could be reviewed.

OUCHI develops a control framework for the analysis of organizational controls. In one of his first publications on control, published with MAGUIRE in the ASQ journal in 1975, he highlights the relevance of two traditional controls, output and behavior control.[236] Building on previous work by THOMPSON (1967), OUCHI extends both control forms with the aspect of social relationships. By observing the parts distribution division of a large company, he evaluates how the management of the purchasing department and the warehouse department ensures behavior of the employees that is oriented towards organizational goals.[237] OUCHI observes that the foreman, besides using formal control, also employs a form of informal authority, building on the trust and respect of his workers to influence the workers in the desired way. The social network with his subordinates allows him to set "ritualized,

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232 Hopwood (1976), p. XIV.
233 He also subsumes formal rewards, sanctions, recruitment policies and training. However he does not focus on behavior controls at all. Cf Hopwood (1976), pp. 24-25.
234 Hopwood (1976), p. 27.
235 Hopwood (1976), p. 31.
236 Cf. Ouchi (1977), p. 98.
237 Cf. Thompson (1967).

ceremonial forms of control"[238] to achieve desired behavior without strictly enforcing it (clan controls). [239]

In one of his first works, MERCHANT (1985) proposes a categorization of control based on the control object:[240] With regard to which entity is controlled by the activities, he distinguishes results, action and personnel control. During the early years of his research he subsumed the social aspects of control as a sub function of personnel control. Owing to increasing research and also on account of his interest on the importance of the social relationships between the employees he took the social aspects and integrated it as the fourth management control form.[241] Hence MERCHANT proposes a categorization of control into *results, action, personnel* and *cultural control*. Besides on the aforementioned control forms of *results* and *action/behavior control*, his focus also falls on the human resource function of an organization to execute control. By hiring and promoting the best-qualified employees to behave in a desired way, MERCHANT proposes to employ *personnel control*. Finally, his framework proposes the use of *cultural control* to shape the organizations' behavioral norms and use social conventions in groups to influence individuals' behavior.[242]

This chapter summarized six frameworks for management control and related control forms. Despite the fundamental similarities, the frameworks differ significantly in relation to their scope, definition of control forms and covered control forms. In order to identify an appropriate framework for this study, the requirements regarding the framework are developed now.

2.2.2.2 Selection of a framework

After the introduction of six potential frameworks for researching management control, the next step selects one framework for further analysis and operationalization. The following section summarizes two requirements for selecting a framework and then discusses the selection process.

First, the framework needs to be aligned with the overall research objective to study indirect forms of control in SMEs. The key elements of indirect controls are socio-cultural

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238 Ouchi (1979), p. 844.

239 A typical application of market mechanisms in this perspective is the application in the purchasing department. By asking the market to put in bids for a standardized product, the final negotiated price can be assumed to be valid.

240 His initial work can be found in Merchant (1985a). Refer also to Merchant (1985b); Merchant/Stede (2003); Merchant/Otley (2006).

241 Cf. Merchant (1985b), p. 29; Merchant/Stede (2003), p. 4 and p. 77.

242 Merchant/Stede (2003), p. 67.

mechanisms and self-controls. As the three frameworks of EMERSON, SIMONS and FERREIRA/OTLEY do not cover social controls, they are not considered further.

Secondly, the research framework for control typology should provide a specific logic to map specific control practices and tools against the elements. HOPWOOD in his 'pattern of organization control' work describes three distinguished mechanisms: administrative, social and self-control. In the opinion of the author, they are not specific enough for two reasons: the former is that all three forms are highly interconnected, as self-control mechanisms are also a consequence of the other two control types;[243] the latter is that administrative controls encompass all formal processes to influence employee behavior ranging from budgets, incentives, rules, processes, and plans to recruitment policies, training and communication policies. Instead of being focused, the concept of administrative controls is rather broad and out-of-focus. Consequently, as the approach is not specific enough, it is not considered further for application in this thesis.

The frameworks of OUCHI are well recited: however, the concept of clan control is a rather 'fuzzy' construct and does not explicitly relate to any control forms. OUCHI's framework was further developed by MERCHANT, who extended the indirect control forms by integrating the concepts of personnel and cultural control into his framework. This split between direct and indirect forms of control, both specific and comprehensive, is expected to fit the research targets best.

Building on the above considerations, the finding that the framework is applicable to SMEs as well[244] and on the previous usage of the framework,[245] this study uses MERCHANT's approach as the research framework in this thesis. The choice for the research framework is line with recent research that also investigates MCS in SMEs.[246]

2.2.2.3 Description of selected framework

As the two control forms of *behavior control* and *results control* have already been discussed in detail, the chapter focuses on the two indirect control forms proposed by the framework.

Personnel control builds on the natural tendency of employees to control and motivate themselves.[247] The key mechanism of personnel control is self-control, an efficient mecha-

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243 Hopwood (1976), p. 31.
244 Cf. Davila (2005), p. 226.
245 Cf. for example Ditillo (2004); Davila (2005). By building on a previously used research framework, this study ensures the comparability of results as outlined in Chapter 2.2.2.
246 Cf. Sandelin (2008), p. 325.
247 Cf. Merchant/Stede (2003), p. 74.

nism that guides the employees on which goals to pursue and to provide them positive feelings of self-satisfaction if personal targets are achieved. Personnel control controls neither process nor outputs, but focuses on the process of recruiting and selecting the best-matching employees to perform the tasks upfront. Training and development assists this as it continuously communicates desired behavioral standards and provides feedback to the workforce. Personnel control is executed, if both task programmability and outcome measurability are low.[248] Research and development (R&D) departments are a typical field of application, as the final outcome of R&D can hardly be defined upfront and relevant steps for target achievement are not known either. Researchers and engineers are, therefore, selected based on previous successful projects and based on their socialization experiences from good universities, with the presupposition that they will know the necessary steps for target achievement. Standardized recruiting processes, placement concepts, training schedules and development processes are techniques to achieve personnel control.

Cultural control[249] builds on the effect of social interaction amongst the members of a group. It refers to "the pattern of shared values and beliefs that guide norms of behavior within the organization."[250] Instead of influencing employee behaviors and actions, cultural control alters the organizational environment and normative culture.[251] An important prerequisite for the application of cultural control is that group members have strong emotional ties to each other.[252] In collectivist countries like Japan, cultural control plays an important role in everyday business. There, the social and moral pressures of the communities are stronger than any legal contracts. Potential management practices are codes of conducts, group-based rewards, role-models or top-management communication.[253]

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248 Cf. Ouchi (1979), p. 843; Snell (1992), p. 295; Merchant/Stede (2003), p. 75.

249 The terms cultural control and clan control are often used synonymously. However, Ouchi's (1979) definition of clan control requires that there be a norm of reciprocity, the belief in a source of legitimate authority and social agreement on the range of shared beliefs and values for a 'clan' to exist. "Social controls can exist when there is agreement on purposes or outcomes, without there necessarily being shared belief systems." Langfield-Smith (1997), p. 208.

250 Jaworski et al. (1993), p. 58.

251 Cf. Cravens et al. (2004a), p. 243.

252 Cf. Merchant/Stede (2003), p. 77.

253 Cf. Merchant/Stede (2003), pp. 77-83.

	Behavior control	Results control	Personnel control	Cultural control
Definition	Control of employees to enforce positive behaviors	Monitoring and rewarding of target achievement	Input control and development of human ressources	Social control of employees using norms and values
Prerequisite	Task programmability	Outcome measurability Responsibility of employee for KPI	Individual motivation	Emotional tie between employees
Management role	Definition of standard processes Conducting process reviews	Output orientation Encouraging meritocracy	Design of prerequisites	Setting and communication of expected norms and values
Management techniques (examples)	Physcial or administrative restrictions (e.g., poka-yokes) Pre-process reviews Definition of standard processes	Pay-per-performance (incentive systems) Budgeting Non-monetary rewards	Recruiting policies Training Job Design Retention	Mission statement Managers as role models Group-based incentives Interaction

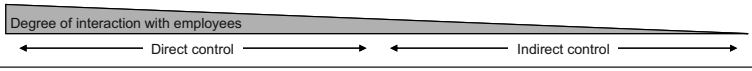

Figure 6: Overview of selected research framework[254]

The four forms are further grouped into two previously described classes of control. Depending on the interaction effect with the employees they are referred to as direct and indirect controls. In case the manager employs process or result standardization, both forms are referred to as direct controls. In case the manager alters the working environment and the rather 'soft' factors, personnel and cultural control are referred to as indirect controls.[255] They are also referred to as being rather unobtrusive.[256]

Previous research used a broad variety of different research frameworks to determine the effects and usage of management controls. Although this could be considered as a sign of a broad and holistic research approach towards management control, it must also be seen as a weakness.[257] It prevents researchers from coming to findings that are comparable across different studies and to build a consistent empirical body of knowledge. To overcome this

254 Own illustration.

255 Jaworski et al. (1993) in their study on management control propose a framework into formal and informal controls that gained a certain acceptance of researchers. They describe formal controls as written management-initiated mechanism, while self- and social controls, and worker-initiated mechanism are referred to as indirect controls. Although both segmentations are valid, however, this study chose not to adopt it as it is potentially misleading: management techniques like budgeting (results control) or recruiting (personnel control) can both be considered formal, as they build on active and defined processes initiated by managers. Consequently, the segmentation into direct and indirect controls is chosen to avoid any misunderstanding.

256 Cf. Styhre (2008), p. 635.

257 Cf. Langfield-Smith (1997), p. 226.

handicap of previous research and to address this research gap, this study chose to select the commonly accepted research framework of OUCHI/MERCHANT.

2.2.3 Combinations of management control forms

After presenting the four control forms in detail, the study now presents an approach to study combinations of the displayed control forms above. MCS consists of different techniques to influence organizational behavior in a desired way. Various studies investigated the effects of specific management control techniques on organizational outcomes.[258] Certain techniques like budgeting were found to be a universal success factor, while other tools like process reviews were found to be beneficial only under specific circumstances. They were investigated separately and the respective direct performance effects were determined.

However, already in early 1950s, ANTHONY (1952) stated that in order to capture fully the impact of management controls, researchers must focus on the simultaneous use of multiple controls.[259] In a similar fashion, HOPWOOD (1976) raises the importance and synergistic nature of controls and hence the requirement to investigate it further.[260] Similarly, JAWORSKI et al. (1993) suggest that, at least in a sales & marketing context, different controls are used simultaneously.[261] Managers tend to use various forms of control, dependent on the desired outcome or information available. Typically, they are part of an overall MCS as managers seek to "balance control and freedom required by subordinates"[262] and utilize the control forms, individual strengths and weaknesses.[263] This balanced approach, however, shows significant sophistication in comparison to the traditional understanding of control being rather mechanistic.[264] Insights are expected to be of high relevance for managers, as they are then able to align their MCS accordingly.

MERCHANT (1985) argues that the benefits of control combinations are twofold. Firstly, "if they are needed and if they are well designed, they should provide better control. They can

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258 For example, the use of performance measures in Ittner/Larcker (1998). Refer also to Chapter 4 for a detailed review on various control forms.

259 Anthony (1952).

260 Cf. Hopwood (1976), p. 35. Despite the early indications, current researchers raised this topic again, e.g., Widener (2007), p. 757.

261 Cf. Jaworski et al. (1993), p. 58.

262 Bart (1993), p. 357.

263 Liao (2005), p. 304.

264 At the same time, the individual control forms are inseparable from one another as they are tied to each other. Alvesson/Karreman (2004) notes on p. 441: "Socio-ideological control is thus intimately tied to bureaucracy and output control. It is not, as claimed by most of the literature on control (e.g Ouchi, 1979, 1980), an alternative to the latter two, useful in situations where complexity and uncertainty make rules prescribing behaviour and the precise measurement of results impossible. In businesses like Global we have in a sense a lot of complexity and uncertainty, but this has been counteracted with efforts to create a vast bureaucratic and output measuring apparatus."

reinforce each other, and they can address a broader set of control problems."[265] In addition, "multiple forms of control provide[s] possibilities for learning, in particular how actions or certain personnel characteristics are related to results. This information can be useful in improving the controls at a later time."[266]

In line with JAWORSKI ET AL., researchers from the field of human resource management such as HUSELID (1995) or MACDUFFIE (1995), acknowledged the relevance of combinations and investigated bundles of different management practices.[267] However, they admit that the concepts are "not linked as much conceptually as they are connected in practice,"[268] but result in favorable consequences like reduced turnover,[269] higher productivity,[270] or increased financial performance.[271] HENEMANN ET AL. 2000 stated that at least in the field of human resource management and especially within SMEs, "the challenge for human resource management is to develop systems of practice that create synergistic effects rather than to develop independent sets of best practice."[272]

However, despite their strong relevance for both researchers and practitioners, only 3 previous studies yielded results in relation to management control combinations. Building on the controlling literature, BART (1993) investigates the difference between the controls of new products in comparison to the controls of established products in 12 large Canadian firms. Using in-depth interviews he found that instead of using only one common control form for new products, general managers "used a variety of 'loose' and 'tight' controls"[273] to "balance the control and freedom required by subordinates with new products."[274] BART actually found that managers were using formal controls in a rather loose way, while the tighter usage of informal controls was applied to balance the rather relaxed formal dimensions. He specifically points out that the reduced usage of formal controls should not be interpreted as an absence of bureaucracy or formal control. Indeed, if a high-output strategy was used, formal controls were an integral part of the control system. BART concludes with the important finding that although formal controls are typically labeled as 'bad', an appropriate level of bureaucracy may in fact be 'beautiful.'[275]

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265 Cf. Merchant (1985a), p. 131.
266 Cf. Merchant (1985a), p. 131.
267 Cf. Tsui (1987); Huselid (1995); MacDuffie (1995).
268 Heneman et al. (2000), p. 22.
269 Cf. Arthur (1994).
270 Cf. Arthur (1994); MacDuffie (1995).
271 Cf. Huselid (1995).
272 Heneman et al. (2000), p. 22.
273 Bart (1993), p. 342.
274 Bart (1993), p. 342.
275 Cf. Bart (1993), pp. 358-359.

JAWORSKI ET AL. in their 1993 paper on control combinations, develop a research framework and investigate the employee consequences of control combinations. By surveying 379 marketing executives, the researchers found that the choice for a specific control combination is predicted by organizational characteristics like size and profitability and task complexity.[276] In relation to the consequences of control combinations, the results indicate that the high control system is associated with the highest job satisfaction followed sequentially by the clan, bureaucratic and low control systems. However, despite the finding of a positive effect on person-role conflict and ambiguity, the study was not able to show a positive effect on job performance.[277]

Building on JAWORSKI ET AL., CRAVENS ET AL. (2004) investigate the control combinations of sales organizations. Using an identical framework of four combinations (high, low, bureaucratic and clan control) they determine the consequences on further dimensions like emotional exhaustion, organizational commitment, turnover intentions of the salesperson, and an extended model of job satisfaction. By using more conceptually grounded hypotheses, he is able to show that "high control combination is associated with the most favorable salesperson consequences whereas low control is linked to the least favorable consequences."[278]

Despite the strong relevance for the entire organization, researchers focus on specific corporate functions (especially sales & marketing). In parts, this is expected to be a consequence of the researcher's desire to ensure comparability of control modes between different functional areas, as different functions have different management requirements.[279] However, this study suggests that the general management of an SME could be a valid research setting to enhance the knowledge on combinations further, as the requirements and responsibilities for executives in SMEs are comparable.[280]

Despite the previous research efforts, contrary results remain. BART (1993) found that both "loose control . . . is equally as bad for new products as is too tight control."[281] On the other side, both JAWORSKI ET AL. and CRAVENS ET AL. found that high controls affect most favorable sales person consequences in a positive way.[282] As previous research provides

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276 Jaworski et al. (1993), pp. 66-67.
277 Cf. Jaworski et al. (1993), p. 6.
278 Cf. Cravens et al. (2004a), p. 246.
279 For example, the study of Hiddemann (2007) reveals that management of R&D operations and sales operations require different sets of operational management techniques. For example, the use of results control is fully appropriate in a sales context to incentivize the sales person, while an R&D manager can hardly be measured entirely based on this target achievements, as his transformation process can be significantly less pre-determined.
280 See also Chapter 6.1 for a discussion on the comparability of control requirements for the top-management team within an SME.
281 Bart (1993), p. 359.
282 Cf. Jaworski et al. (1993), p. 65; Cravens et al. (2004a), p. 246.

contradictory results in relation to the consequences of control combinations and as no previous research covered general management as a research setting, this study will ask two research questions in relation to control combinations: which combinations are actually used in SMEs to control subordinate managers, and which outcome consequences are associated with these combinations.

In order to study control combinations in managerial application, a relevant typology is required.[283] As previously outlined, two basic dimensions of controls can be distinguished, based on the interaction and the perceived rigidity of techniques by the employees: direct and indirect controls. Combinations are defined using the associated control forms of results and behavior control (direct controls) as well as personnel and cultural (indirect) controls. Besides the consideration based on the effects of employed controls, the typology is also in line with the previous work of JAWORSKI ET AL. (1993) and CRAVENS ET AL. (2004).[284] This allows to extend previous research and to build on previous insights on control combinations.

The combinations are defined using the extent of the two dimensions of direct and indirect control. Specifically, the extent of direct control is determined by using the average of the underlying indicators of results and behavior control. Indirect control is constructed accordingly. Finally, combinations are grouped in accordance with their extent into high and low usage on both dimensions and are analyzed in a matrix. High control combinations are considered configurations where managers use both direct and indirect controls in a strong extent. Contrasting this, managers who use low levels of both forms are considered to apply the combination of low control. Organizations employing primarily the personnel and cultural control and thereby trying to alter the working environment to desired behavior are described as 'clan controls' following the concepts of OUCHI (1979, 1980). Bureaucratic control is an MCS focusing on traditional controls such as results and behavior control, while only using low levels of indirect controls. Figure 7 visualizes the four control combinations.

[283] Cf. Malmi/Brown (2008), pp. 288-289.
[284] Cf. Jaworski et al. (1993), p. 59; Cravens et al. (2004a), p. 242.

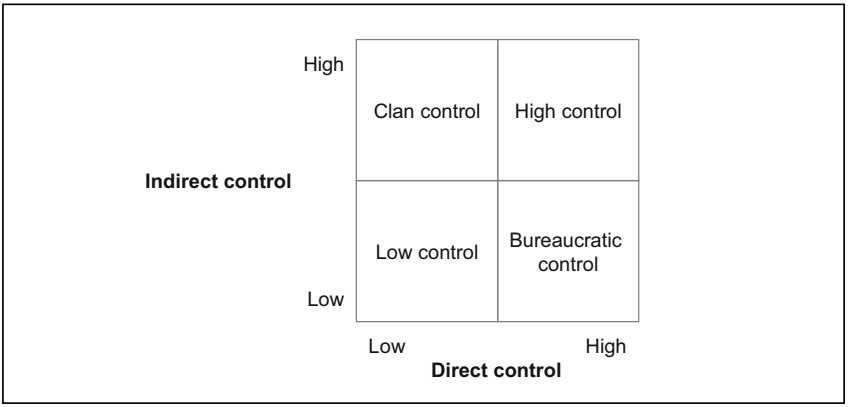

Figure 7: Overview of management control combinations[285]

This study seeks to investigate both the usage patterns amongst SMEs and the performance effects for four distinguished combinations of high and low, and direct and indirect control forms.

To sum up, the control combinations are of high academic and practical relevance as they address a rather configurational management research approach. The only two existing studies on control combinations were conducted in the area of sales & marketing personnel.[286] However, managers in all functional areas tend to use combinations of controls instead of specific forms in isolation. Hence, an extension to control in general management and to SMEs would be beneficial for the field. To specifically address the gap in research, this study chose to investigate control combinations from the perspective of an SME CEO and to develop knowledge on the performance consequences of control combinations further.

2.2.4 Performance consequences and moderating effects

Management control has consequences in organizations ranging from individual perceptions such as job-satisfaction and job stress over group innovativeness to organizational consequences such as increased organizational performance. Before defining a structural model of interdependencies, the core relationships between management control forms and the respective outcomes have to be reviewed.

Initially, the researcher needs to determine the direction of causality of the MCS in their model. Fundamentally, an MCS can be considered as an outcome (dependent variable) or the

[285] Own illustration adapted from Jaworski et al. (1993), p. 59.
[286] Despite a case study on MCS packages in a young, high-growth firm; however, this study is not concerned with the performance impact. Cf. Sandelin (2008), pp. 337-340.

antecedent of other constructs (independent variable).[287] Previous researchers, such as OTLEY/WILKINSON or MERCHANT, already analyzed MCS as a dependent variable of effectiveness[288] or firm performance.[289] Such a direction of causality is of particular interest, if the desired outcomes are MCS usage patterns based on other contingent factors such as task programmability variables.[290] However, as this study seeks to assist managers of SMEs to increase company performance by using management control, it chose to analyze MCS as an independent variable. Besides the strong practical relevance of this research setting, the decision was based on two other reasons. The first is that other researchers suggest investigating MCS as an independent entity as previous research yielded effects in this perspective. Researchers like OTLEY, WILKINSON and, just recently, CHENHALL suggest that "the outcome variables should be some dimension of desired organizational or managerial performance."[291] The second reason is that agency theory by itself suggests a direction of causality: by applying principles from the theoretical suggestions, the respective principal-agent costs decrease, which is then reflected in an increased organizational effectiveness and performance.

In order to define the consequences in detail, researchers need to define four topics: the nature of outcomes, the type of performance effects (best-practice vs. contingent), the direct vs. indirect nature on performance, and the potential existence of a fit relationship.

2.2.4.1 Management control performance consequences

This chapter elaborates on the choice of performance as a dependent variable, and discusses the nature of performance and reviews the interaction with other variables.

Nature of consequences. Management control consequences can be structured into three main blocks. Firstly, researchers considered various notions of the usage and usefulness of MCS in organizations.[292] However, the author considers the outcomes of medium use for researchers

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287 Chenhall (2003), p. 226.

288 Cf. Otley/Wilkinson (1988).

289 Cf. Merchant (1985b).

290 However, MCS could also be considered as an outcome of effectiveness. The following example illustrates this. In the case of a low organizational performance, it could be of particular interest how companies choose to configure their strategy and respective MCS and which forms of control are of particular importance as a consequence of this in this case. Cf. Langfield-Smith (1997), p. 226.

291 Cf. Otley (1980), p. 428; Chenhall (2003), p. 134.

292 For example, its information provision (Mia/Chenhall (1994)); degree of usage (Abernethy/Guthrie (1994); Foster/Swenson (1997); Anderson/Young (1999); Guilding (1999)); usefulness: (Chenhall/Morris (1986); Shields (1995)); beneficial effects of MCS (Chenhall/Langfield-Smith (1998)); importance to product development (Davila (2000)); helpfulness to the organization (Guilding (1999)); satisfaction with systems (Bruns/Waterhouse (1975)).

or practitioners. On the one hand, as employees are potentially forced to use specific tools although they are considered of little use to their operations; thus, these results are interesting rather from a descriptive perspective. Further, linking certain outcomes like usefulness, satisfaction or adoption rates to organizational outcomes is currently considered rather critical.[293] This study, therefore, chose not to measure usage patterns of controls in SMEs.

Secondly, previous work determined the effects on behavioral outcomes of controls. Consequences like job satisfaction,[294] job-related tensions, or stress[295] play an important role in the identification and commitment of employees into organizational goals or strategies and were studied by various researchers. Despite the importance of behavioral consequences of controls in organizations, this study chose not to investigate them in detail, as significant previous research in large and small organizations already reviewed the effects.[296]

Finally, organizational outcomes were used to evaluate management controls.[297] The basic assumption is "that . . . systems affect the behavior of individuals within the organization, which then facilitates the achievement of organizational goals."[298] From a control object's perspective, control can affect outcomes like managerial processes[299] (e.g. R&D management or sales efficiency) or the overall achievement of organizational goals.[300] Organizational performance originates from the achievement of organizational goals the management defined to reach an overall strategic goal or plan.[301] As this study aims at improving SMEs by enhancing their operational performance and guiding them in how to optimize their internal control system, it chose a perspective of the overall organization, rather than an individual or department level perspective. Previous studies in fact suggest an effect of control intensity on performance.[302] The adoption of accounting practices like budgetary controls, balanced scorecards or integrated MCSs were found to be beneficial for organizational performance.[303] Numerous other studies from the related field of HR management controls also showed the direct beneficiary effects of MCS on organizational performance.[304]

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293 Chenhall (2003), p. 135.
294 Cf. Brownell (1982); Chenhall/Morris (1986); Banker et al. (1993).
295 Cf. Hopwood (1972); Hirst (1983); Brownell/Hirst (1986); Shields et al. (2000).
296 For a summary of findings of previous research in SMEs, please refer to Chapter 1.2.
297 Cf. Paauwe (2009), p. 129.
298 Hall (2008), p. 142.
299 Cf. Mahoney et al. (1963).
300 Cf. Govindarajan (1984).
301 Cf. Anthony/Govindarajan (2003), p. 8.
302 Hiddemann (2007) showed this specifically for young firms.
303 Cf. for example Davila (2005); Davila/Foster (2007).
304 Cf. Russell et al. (1985); Kleiner et al. (1987); Terpstra/Rozell (1993); Arthur (1994); Osterman (1994); Pfeffer (1994); Huselid (1995); MacDuffie (1995).

Best-practice vs. contingent approach. Researchers found direct effects of control on performance; others claim that the performance effects are highly dependent on contingent factors. The best-practice approach implies that a certain control form must be of a best-practice nature and have a direct effect on performance, while the contingent approach claims that environmental factors have to be taken into consideration.[305] Diverse literature on management controls in HR, previously also raised the issues of contingent factors on the performance relationship.[306] While investigating the effects of MCS and manufacturing strategy on operational performance, in 97 plants, YOUNDT ET AL. (1996) compared the contingent perspective with universal perspective. They found that a contingent perspective on management control was superior in comparison to a universal perspective.[307] In line with this, YAO-SHENG (2005) also found management control to be associated with a contingent effect, as input control interacted with innovation oriented strategy in its effect on performance.[308] However, YAO-SHENG at the same time found a direct effect of behavior controls on performance. As the discussion shows, the results on the nature of the control effect on performance are ambiguous, which is confirmed by recent research.[309] However, although the final decision about either of the two approaches is desirable, this study follows YOUNDT ET AL. (1996) by assuming that both perspectives are complementary and can be integrated: universal effects of certain controls can demonstrate a broad applicability through different organizations and configurations, while an additional contingent perspective can be beneficial to adapt controls by situation.[310]

This study addresses both perspectives. By investigating the direct effects on performance, it takes a universal/best-practice perspective. On the other hand, by testing the effect of moderators on control effectiveness, it also takes a contingent perspective. A comparison of both approaches is expected to contribute to the discussion of the overall nature of control. In summary, previous research found evidence both for the universal and also for the contingent perspective. In order to address both research streams, this study conducts a comparison of both perspectives.

Direct vs. indirect effect on performance: As outlined before, previous studies predominantly investigated controls directly affecting outcomes.[311] This study takes a similar perspective.[312] However, some researchers chose to include other constructs or causal chains to capture

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305 Cf. Child (1974), pp. 175-177; Youndt et al. (1996), p. 837.
306 Cf. Snell/Youndt (1995), pp. 729-730.
307 Cf. Youndt et al. (1996), p. 858.
308 Cf. Liao (2005), pp. 304-305. For a similar perspective see a following paper Liao (2006), p. 193 or Porporato (2008), p. 4.
309 Cf. Paauwe (2009), p. 133.
310 Cf. Youndt et al. (1996), p. 837.
311 Cf. for example Otley (1978), p. 146; Snell/Youndt (1995), p. 729; Liao (2006), p. 194.
312 This is in line with success factor research in the field of HRM. See Sels et al. (2006).

indirect effects of control. Both approaches are potentially valid, based on the researcher's theoretical considerations and desired practical results. Extending the current state of research in this field, SHIELDS ET AL. (2000) found that on an individual's level, an indirect model with controls affecting job-related stress had a significantly better fit than a direct effect model.[313]

Despite the results, due to the limited transferability of the finding to an organizational level, this study chose to determine the direct effects of controls on performance. After determining the fundamental effect, other researchers could try to extend the model by employing causal chains between controls and performance.

Direct link or a fit relationship. In comparison to the direct effect, the fit relationship builds on contingency theory that explains MCS effects based on contextual factors. High performance is expected where there is strong congruence between contingencies and the resulting MCS configuration.[314] CHENHALL (2003), in relation to the direct effects, states that "compelling theory is required to show how the combination of MCS and the context enable managers to take more effective decisions that enhance organizational performance."[315] Direct effects can, therefore, be supposed, if a strong theoretical foundation suggests so. Both approaches, the direct effects and fit-approaches, were previously used in accounting research and are considered valid. However, this study takes the perspective of a direct relationship between controls and performance as it is building on the well established agency theory. Control forms build on one of three agency problems, decrease principal-agent costs and directly influence organizational performance. Principal-agent theory does not suggest a fit-relationship based on contingent factors. However, this study, by investigating moderating factors and their interaction effects on performance, still considers the contingent effects in the research model. In addition, the direct approach is in line with several other research efforts in this field.[316]

To sum up, this study aims at investigating the direct effect of management control forms on the organizational performance within SMEs. Previous research supports the assumed relationship and suggests a positive effect of controls on organizational performance.

2.2.4.2 Moderators of the performance effect

As detailed in the paragraphs above, a strong body of research developed evidence for the fact that the effect of management controls on performance is actually contingent upon different

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313 Cf. Shields et al. (2000), pp. 196-198.
314 Cf. Huselid (1995), p. 643; Greenhalgh (2000), p. 423.
315 Chenhall (2003), p. 135.
316 Cf. Huselid (1995); MacDuffie (1995); Delaney/Huselid (1996); Delery/Doty (1996); Huselid/Becker (1997); Chandler/McEvoy (2000).

internal and external factors. In order to address these previous findings on the contingent effect as well, this study chose to include moderating factors in its research approach.[317] However, in order to focus on the original purpose of this study (i.e. understanding the effects of indirect controls in SMEs) this thesis focuses on the aspects dealing with the evolution of the organization along the corporate life cycle rather than integrating the vast sum of potential moderators.

As the evolution of organizations and their growth is an integral part of this study (see also Chapter 1.3), it aims at understanding the transition from a start-up to a mature organization. As GREINER proposes in his 1972 and 1998 HBR articles, three key factors are associated with the organizational evolution.[318] First, company age is of specific importance as management practices are not maintained throughout a long time span,[319] and there can be potentially loose effectiveness with time.[320] While managerial behavior becomes increasingly institutionalized, employees' attitude appears to be difficult to change. Secondly, increasing size and sales are associated with evolving issues of communication and coordination, as hierarchies and management functions are required to manage the organization. Thirdly, organizations are mastering critical phases during their life cycle. In order to grow further, they have to master different crises.[321] To overcome them, managers have to determine a new set of organization practices that address these issues. The critical phases are as well associated with the beginning of a new organizational life cycle stage. In contrast to size and age, they bear the advantage of comparability across industries.[322] In essence, this study investigates size (measured in number of employees), age, and life cycle stages as three key moderators.

Extending the research of GREINER about the evolution of firms, research on young firms found that management resources are expected to have an effect on MCS as well. For example, an important step in the life of an organization is the transition from the founder to a professional management team. The idea, "In order to grow, the founder must go,"[323]

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317 To focus this study on the key factors influencing management control effectiveness, this study chose to restrict its focus on moderating factors. However, the factors leading to a specific MCS configuration, especially the choice of indirect controls is of highly important nature as well. In order to address this open research question, there is an undergoing research activity at the chair of management sciences for engineers and scientists of RWTH Aachen University in this area.

318 Cf. Greiner (1972), p. 39; Greiner (1998), p. 56.

319 Cf. Greiner (1972), p. 39.

320 Cf. Greiner (1972), p. 40.

321 For example, crises of leadership, autonomy, or control. Cf. Greiner (1972), p. 41.

322 Transition from one life cycle stage to another cannot be determined solely by the age or size. As Fallgatter (2004), p. 29 notes, "a new firm in one industry can be much older or younger in the absolute number of years than a new firm in a different industry." Wiedenfels (forthcoming), p. 18.

323 Willard et al. (1992).

characterizes this development. The literature suggests "that personal characteristics of most entrepreneurs are well suited for the uncertain environment of a young startup; but these same characteristics are ill-suited to the management of a more structured and larger organization."[324] Previous research showed that the replacement of the founder with a new CEO is associated with the implementation of formal and sophisticated MCS.[325] In relation to the effectiveness of the management control forms, however, this study assumes that it is not the mere introduction of a new CEO that is of importance, but the how a manager utilizes these MCS. Increased experience enables managers to choose relevant control forms and be more effective in their application, as they previously experienced both failures and successful implementations. Independent from the location where they gained their experience as a manager, their familiarity is expected to be beneficial for the application of different control forms. Hence, this study determines the effect of an experienced management team on control effectiveness as well. As previously discussed, MCS and their performance effect are expected to be influenced by internal and external contingencies. This study examines the effects on the control–performance relationship by investigating the contingencies associated with the evolution of an organization.

To sum up, to contribute to the development of management control research, this study chose to extend the consequences of controls investigated significantly. While previous academics focused their research efforts on the adoption and implementation patterns, current research lacks the coverage of organizational performance.[326] Performance in this context is of specific importance as a key criterion to determine the effectiveness of specific management tools. To address this research gap, this study chose to enrich the theoretical discussion by investigating alternative control consequences and to determine the effect of control intensity increase on organizational performance. The results are especially relevant for managers seeking to choose the most efficient MCS for their SME. In addition, this study intends to contribute to research by investigating the nature of management control. The question whether management control is of direct effect or contingent upon other factors remains unsolved up to now.

2.3 SMEs and their liabilities

Firm size is a classic contingency factor in traditional organizational research. CHENHALL (2003), in his review on contingency-based MCS research, points out that only a few studies on MCSs include size as a contextual variable.[327] Studies on management control historically

[324] Davila (2005), p. 228.
[325] Davila (2005), pp. 243-244.
[326] Cf. e.g., Hopwood (1972); Brownell (1982); Hirst (1983); Brownell/Hirst (1986); Chenhall/Morris (1986); Banker et al. (1993); Shields et al. (2000).
[327] Cf. Chenhall (2003), pp. 148-150.

focused on large established organizations and only recently started to focus on small organizations.[328] The major results for large organizations show that as their size increases, firms increasingly use rather formal and developed MCSs.[329]

SMEs are not 'little' versions of large firms.[330] Due to their inherent characteristics, they operate and behave in a manner different from that of large organizations. This paragraph both reviews the overall weaknesses of SMEs in comparison to large organizations and summarizes the resulting consequence for MCSs in SMEs.[331]

Numerous differences exist when comparing small enterprises with large ones. GHOBIDIAN (1996) developed an overall set of 33 dimensions discriminating small and large organizations.[332] To focus on the discussion, three general liabilities of SMEs were condensed, that focus on the requirements of management control. The summary of the findings on the three liabilities builds on the definition of liabilities for young, growing firms as previously applied by other researchers but takes into consideration the specific characteristics of SMEs.[333]

First, SMEs face the *liability of smallness*. Their limited size restricts the endowment with sufficient resources in various dimensions (human resources in general, management and specifically financial resources).[334] To accommodate the resource shortage, SMEs are organized in a rather flat manner with a low number of hierarchical layers. Alternative manifestations of this issue are procedural bottlenecks in their organizations due to limit availability of human resources.[335] For instance, SMEs, especially during their birth, are faced

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328 Cf. Langfield-Smith (1997), p. 213; Luft/Shields (2003), p. 170; Davila (2005), p. 225; Speckbacher/Wentges (2008), p. 1.

329 Cf. Bruns/Waterhouse (1975), p. 199; Merchant (1981), p. 825; Merchant (1984), p. 303; Amat et al. (1994), pp. 119-120.

330 Cf. Welsh/White (1981), p. 18; Brouthers/Nakos (2004), p. 229.

331 As Gruber (2003) notes, the characteristics of young/small firms are not necessarily a disadvantage. A small size and agile organizational structures can also be translated into a significant advantage in comparison to a large and potentially slow competitor. However, this study focuses on the liabilities of SMEs, as they have important implications for the usage of controls in SMEs. See also Engelen (2008), p. 40.

332 Cf. Ghobadian/Gallear (1996), p. 88.

333 The definition of specific liabilities of organizations builds on an analytical framework previously developed at the Chair of Business Administration for Engineers and Scientists of Prof. Brettel (RWTH Aachen). The framework has been adopted to match the requirements of small organizations in contrast to young organizations. For example, on the usage for young organizations refer to Claas (2006), p. 53; Engelen (2008), p. 34; Müller (2008), p. 21.

334 Cf. Welsh/White (1981), p. 18 and 32; Storey (1985), p. 329; McDougall/Robinson (1990), p. 447; Schoonhoven et al. (1990), p. 177; Li (2001), p. 184.

335 Cf. Welsh/White (1981), p. 18; Aldrich/Auster (1986), p. 181; Weinrauch et al. (1991), p. 44;. Ghobadian/Gallear (1996), p. 87.

with a constant "lack of adequate resources regarding accounting functions."[336] No separate organizational development departments are existent; if anyone, the owner-manager also takes over this role. In addition, the degree of functional specialization amongst employees is rather small; SME staff is required to cover rather broad functional areas in comparison to large enterprises.[337]

Missing human and, specifically, management resources potentially restrict the ability to control an SME effectively: having to handle various tasks from strategy development over HR issues to manufacturing operations, top-managers spare only a little time to devote to the topic of management control. But limitations are not only bound to management activities but are also tied to data systems. Limited financial resources also result in the absence of sophisticated controlling processes or elaborate enterprise resource planning (ERP)-systems, that are used in large organizations to provide information and data for control activities.

Second, the *liability of informality* affects SMEs by the absence of a formal structure and a low level of standardization. The rather 'organic' organization is typically characterized by only few layers of hierarchy, compact organization-charts and the absence of standardized processes.[338] As a consequence of little organization and low standardization, the working relationship becomes much more informal and leaves significant opportunities for short decision making chains.[339] The level of informality is also associated with the costs for communication within the organization. The need for individual communication rises quadratically with the number of employees involved.[340] Hence, an inappropriately high level of informality is associated with significant communication costs as well, but can be reduced by the implementation of formal procedures or management accounting systems.[341]
Consequently, informality also restricts the usage of management controls: as organizational structures and standard processes are not clearly defined, control is difficult to be executed due to missing standards to compare against. With growing company size, informal or implicit control mechanisms lose their effect as communication complexity increases exponentially and direct communication with every employee is not an option any more.[342]

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336 Granlund/Taipaleenmaki (2005), p. 31.
337 Cf. Perez-Sanchez et al. (2003), p. 72.
338 Cf. Ghobadian/Gallear (1996), p. 87.
339 Cf. Pichler (1997), p. 12.
340 The number of ties required to communicate with n employees can be calculated N = n * (n-1)/2.
341 Cf. Davila/Foster (2005), p. 1044.
342 The liability of informality is especially important in the context of management control, as it allows this study to research indirect controls in an ideal research environment. However, an alternative approach is to include it in the liability of smallness, as both liabilities are interconnected with each other.

Finally, ownership and management in SMEs are typically integrated in one person (*owner-manager dominance*).[343] Due to the concentration of decisions and controls in the owner, the faithfulness and success of an organization is strongly interconnected with the characteristics of this one person.[344] Owner-managers are typically emotionally involved in 'their' organization, which might lead into deficiencies in decision processes or accumulation of decision-making authority.[345] Another consequence is a rather small management team (besides the owner-manager) with a low level of authority.[346] In comparison to large organizations, where professional managers govern the activities, SMEs' management is rather influenced by pioneering and entrepreneurial spirit.[347]

In relation to management control, owner-manager dominance is neither considered a liability nor an advantage. On the one hand, a central authority for controls emphasizes its effects due to the management attention; on the other hand, a strong concentration on only one person also can be a disadvantage in the case of limited time for control activities (in line with the liability of smallness).[348]

From this review of SME characteristics, one can summarize: first, SMEs have distinct organizational traits that clearly distinguish them from large organizations; second, the charateristics of SMEs also have an influence on the organization as they alter the ability and type of resources available to the management; third, the characteristics of SMEs also influence the design of an MCS substantially by restricting the ability of managers to pursue management control tasks or build on sophisticated IT systems to conduct control. As a consequence of the SME liabilities, this study explicitly considers the organizational characteristics of SMEs when determining the performance consequences of control forms and related moderating effects.

Table 1 summarizes the previous findings and effects on the design of MCSs in SMEs.

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343 Cf. Kazanjian (1988), p. 160; Schefczyk/Pankotsch (2002), p. 24.
344 Cf. Chandler/Hanks (1994), p. 85; Pichler (1997), p. 12.
345 Cf. Pichler (1997), p. 12; ownership structure even influences the effectiveness of management practices: Bloom/Van Reenen (2007) found that when family-owned firms pass management control down to the eldest sons (primo geniture), the management practices were significantly poorer than in the comparison group (pp. 33-34).
346 Cf. Pichler (1997), p. 28.
347 Cf. Ghobadian/Gallear (1996), p. 87.
348 Refer to the section above.

Liability of SMEs	Defining characteristics	Management control constraints
Smallness	Low level of resources • Financial • Human resources • Management • Systems	Limited availability of resources to execute control effectively • Management resources for control activities • Controlling figures/IT systems for control
Informality	Informal organization Organic structures Low degree of specialization	Unclear organizational structures, hierarchies, responsibilities to conduct control No standard processes to ensure process efficiency, effectiveness and conformity of employees Task implementation driven by informal mechanisms
Owner-manager dominance	Small management team or dominant owner/manager Low level of delegation	Concentration of decision-making competencies and strong demand for controls Desire to concentrate key decisions on owner/top-management team

Table 3: Liabilities of SMEs in relation to management control[349]

[349] Own illustration.

3 Theoretical framework

The previous chapter provided the conceptual foundation and selected the research framework for this study. Despite the fundamental importance of the research framework, the confirmatory approach of this study requires a theoretical foundation in order to derive propositions about the relationships between management control forms and performance. A theoretical framework provides an in-depth understanding of the relationships between theoretical concepts and highlights the most relevant questions of a research situation.[350]

By using a solid theoretical framework, this study distinguishes itself clearly from a variety of recent studies on management control in SMEs that predominantly considered contingency theory as their primary theoretical foundation. Researchers like DAVILA (2005), DAVILA/FOSTER (2005), SANDINO (2007) and CARDINAL (2001, 2004) failed, in the opinion of the author, to build their research model on a commonly accepted theoretical foundation to derive their findings, although they included various internal and external factors influencing controls in their research,.[351]

In order to build on a solid theoretical foundation and to overcome this discrepancy, the following chapter presents a structured approach to the selection of an appropriate framework (Chapter 3.1). What follows is a detailed description of both selected frameworks (Chapter 3.2 and 3.3); the application to the research questions raised in this study is also discussed in detail (Chapter 3.4).

3.1 Potential frameworks and selection of a framework

Various theories have previously been associated with control in organizations. SJURTS (1995), during her literature review on theories of control, aggregated nearly 20 theoretical frameworks.[352] The theories range from the traditional cybernetic understanding of control over agency theory to psychological concepts like control as meso-politics.[353]

Theoretical frameworks can be structured by their descriptive characteristics along several dimensions. This study employs the taxonomy of SJURTS to distinguish the theories.[354] Due to space constraints, the taxonomy will not be discussed in detail, but it serves as a structure to identify the most relevant theories. In a first step, theoretical frameworks of control can be

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350 Cf. Picot et al. (2005), pp. 23-24.
351 Cf. Cardinal (2001); Cardinal et al. (2004); Davila/Foster (2005); Davila (2005); Davila/Foster (2007); Sandino (2007).
352 Cf. Sjurts (1995), p. 11.
353 For an overview on all potential theories see Sjurts (1995), pp. 12-109.
354 Cf. Sjurts (1995), pp. 114-115.

distinguished by their goals pursued into *monitoring* and *influencing employee's behavior*. As previously outlined in Chapter 2.2.1.1, this study seeks to analyze control as an integrated function of management and with the goal of changing employee's behavior ex-ante. Therefore, the theories describing behavioral aspects of control are favored for this study.

In a second step, the hierarchical perspective of control can be used to distinguish theoretical foundations: depending on the research questions of the study, one can refer to the *managerial* or the *employee perspective*. This study aims at understanding the effects of management control within small and medium sized organizations and how it is executed by the SME management. Hence, it aims at suggesting to the managers how to interact with their employees and influence their behavior. Hence, a managerial perspective is chosen.[355]

Finally, theoretical frameworks can be differentiated by their relationship to control: theories, in which the effect of control is not the primary concern (considered only as an *auxiliary effect*) such as behavioral accounting[356] or meso-politics,[357] can be differentiated from theories that specifically address control (control as a *primary effect*). Due to this study's specific focus on management control and its consequences, a theory that also captures control in its core is required for this study. The selection process is summarized in Figure 8.

[355] As a consequence, theories focusing on an agents' perspective such as micro-politics within organizations, either as an arrangement as resistance, are not considered further. Cf. Bosetzky (1972); Braverman (1974).

[356] Behavioral accounting focuses on the interaction between accounting practices and the employees. The primary role of accounting figures are for information, while they can induce some sort of control, as they also can be used to perform target-actual comparison. For the intial works see also Hopwood (1973); Hopwood (1974); Hölzer/Lück (1978).

[357] Literature from the field of meso-polictics understands that formal organizational structures are interest related reflections of reality that are aligned with the societal context and develop accordingly. The theory focuses primarily on the execution of control and power, while disregarding any goals or forms of control. Cf. Boreham (1980); Storey (1983).

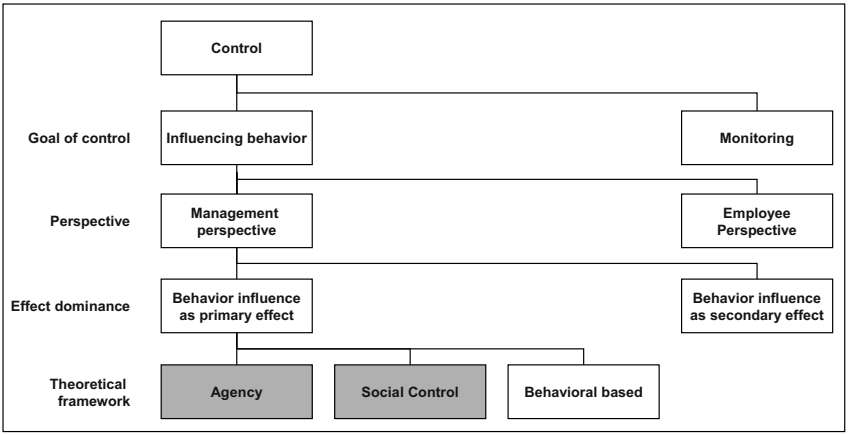

Figure 8: Selection of a theoretical framework[358]

In the following section, the three remaining applicable theories of control, namely, the behavioral based approach of control, agency theory and social control theory are discussed further.

The **behavioral based approach of control** describes control as a combination of (i) employee's behavior influence and (ii) the psychological impact of control.[359] It, therefore, extends the mechanistic view of traditional control and includes the emotions of both the controlling and the controlled persons.[360] TANNENBAUM, as the main contributor, describes institutional control as the circle of a person's intent for a specific action, his attempt to influence the second involved party and the influence on the behavior of the second party.[361] Although he adds the important dimension of psychology in the relationship of the persons executing control and the persons being controlled, he fails to describe a framework to evaluate control forms or review forms of control.

Agency theory describes the problems involved in a separation of decision-making and execution and suggests potential solutions. It can be applied to specific situations in organizations, stakeholder relationship or even politics. The main focus of the theory is a contractual relationship between a risk-neutral principal and his risk-averse agent. Building on

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358 Own illustration.

359 Tannenbaum (1962) and (1968) was the key contributor to this discussion; however, McMahon/Ivancevich (1976) and Todd (1978) also contributed to the discussion, but mainly built upon the work of Tannenbaum (1968). Among others, applications of the approach can be found in Kavcic et al. (1971); Kavcic/Tannenbaum (1981); McMahon/Ivancevich (1976).

360 Cf. Tannenbaum (1968), p. 3.

361 Cf. Tannenbaum (1968), p. 6.

the assumptions of informational asymmetry and differing risk sharing profiles, agency theory describes contractual problems between both parties and proposes countermeasures to overcome the informational asymmetry (i) before and (ii) after contract closure.[362] The major contribution of the theory is a set of potential solutions to heal the agency issue.

Social control theory considers the adoption of the norms or habits of individuals in the context of an organization. It specifically seeks to explain the social processes to increase or secure conformity in organizations. The two involved parties, the individual and the group he enters, aspire at reducing their differences in norms and values. The theory assumes that an individual adjusts his behavior once confronted with a group of individuals who share an alternative value set. In contrast to formal control processes, the social control process builds on the individual's personal desire to reduce the differences in the norms rather than an external stimulus to do so.[363] It specifically points out the need for recruiting appropriate candidates and the social processes happening during the adoption of norms and values.

Behavioral science theory integrates the two important notions of behavioral influence and the psychological consequences of control. However, it does not include the effects of specific control forms and rather lays out the framework in which control forms operate. Hence, due to the lack of specificity to determine the effects of individual control forms and its rather psychological perspective, it is not applied to this study.

Agency theory is an established theoretical concept, appropriate for the specific research setting and has previously been used to explain the effects of management control.[364] It will, therefore, be used to describe the effects of control on the organization. At the same time, as detailed in Chapter 1.1, this study specifically seeks to complement the traditional view of direct management control by investigating the rather indirect effects of management control. In this context, the agency theory is not able to cope with this notion, as the effects are typically based on a contractual relationship instead of a social one. This study, therefore, chose social control theory to supplement the agency theory in relation to the indirect control forms.

Both applied theories are presented in detail below and discussed in terms of their application to management control.

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362 Cf. Jensen/Meckling (1976), p. 308; Eisenhardt (1985), p. 136.
363 Cf. Hopwood (1976), p. 27.
364 Among others cf. Eisenhardt (1985), p. 136; Baiman (1990), pp. 341-342.

3.2 Agency theory

Agency theory is closely interconnected with the transaction cost economics (TCE) framework. While TCE focuses on the general relationship among economic actors, the principal-agent theory specifically refers to situations where the two involved parties can be identified as one party (principal) contracting another party (agent).[365] The main characteristic of the principal-agent configuration is that the actions taken by the agent have a significant impact not only on the benefit level of the agent but also on the benefit level of the principal party himself.[366]

Agency theory aims at explaining effective contracts between the client and contractors and builds on three fundamental assumptions about the involved parties and their interactions:[367]

- Information asymmetry between both parties in favor of the agent
- Conflict of interests between principal and agent
- Opportunistic behavior of agent

Agency theory specifically addresses situations in which the principal delegates tasks to the agent.[368] Typically, this is a result of the increasing specialization of functions and delegation of managerial activities to subordinate employees. Due to the agent's opportunistic nature, he will not always take actions that are in the principal's best interests.[369] The principal, however, can diminish the impact of such aberrant behavior by imposing processes, regulations or incentive that either monitors the agent's behavior or aligns the incentive schemes.[370]

The difference between the outcomes of an ideal configuration without any information asymmetry (first-best solution) and that under the condition of information asymmetry and opportunistic behavior (second-best solution) is referred to as the *agency costs*. The main goal of the manager is the optimal design of controls, incentive schemes and employee interaction in order to minimize agency costs.[371] Agency costs consist of three different types of costs:[372]

- *Signaling costs of agent*: all costs associated with the effort of the agent to reduce the information asymmetry between him and the principal, for instance, by the presentation of performance reports, preparation of application documentation or the efforts for meeting preparation.

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365 Cf. Jensen/Meckling (1976), p. 308; Eisenhardt (1985), p. 136.
366 Cf. Picot et al. (2005), p. 72.
367 Cf. Kieser (2002), p. 211; Bea/Göbel (2006), p. 156.
368 Cf. Eisenhardt (1989a), p. 58.
369 Cf. Macintosh (1994), p. 30.
370 Cf. Jensen/Meckling (1976), p. 323.
371 Cf. Weber/Schäffer (2006), p. 25, Picot et al. (2005), p. 74.
372 Cf. Picot et al. (2005), p. 73.

- *Control costs of principal*: principal's costs to conduct control activities, for example, by meeting with the agent, checking data or having personal interaction with the agent.
- *Remaining residual loss*: the difference between the actual and the theoretically optimal (symmetric information) organizational configuration.

All three cost types are interrelated: by significantly increasing principal's control costs (e.g. through continuous monitoring of the agent's behavior by the principal), the signaling costs and the residual loss can be reduced. However, one configuration is preferable to another, when its overall agency costs are lower. Despite numerous research efforts, the absolute size of agency cost cannot be measured empirically.[373] Typically, it is rather used to model the behavior of principals and agents in numerical simulations.[374]

Since the earliest papers on agent theory by SPENCE/ZECKHAUSER and ROSS, scholars have been striving to develop the theory further and add further aspects to it.[375] As JENSEN points out, two almost separate research streams evolved from the agency theory:[376]

- Normative stream ("principal-agent theory")[377]
- Descriptive stream ("positive agency theory")

Both research streams share a common unit of analysis: the contractual relationship between the principal and his agent. They share common assumptions about people, organizations, and information but differ in their mathematical rigor, dependent variable, and style.[378] The *normative stream* uses formal theories and rigid assumptions to analytically develop efficient incentive systems, while considering different organizational configurations. The most prominent author in this stream is HOLMSTRÖM with his 1979 book *Moral Hazard and observability*.[379] Due to the analytical nature of the stream, scholars criticized the principal-agent approach for being "abstract and mathematical"[380] and, therefore, less accessible to organizational scholars.[381]

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373 Cf. Bea/Göbel (2006), p. 164.
374 Cf. Kieser (2002), p. 224; Weber/Schäffer (2006), p. 25.
375 Cf. Spence/Zeckhauser (1971); Ross (1973).
376 Cf. Jensen (1983), p. 334.
377 Frequently, researchers mix up the different streams into the principal-agent theory. E.g., Picot et al. (2005) do not refer to the normative stream at all; they subsume all agency related theory under the topic of principal-agency theory. To avoid misinterpretation, this study refers from now on to agency theory as its theoretical foundation.
378 Eisenhardt (1989a), p. 59.
379 Cf. Holmström (1979); numerous other researchers developed it further. Refer, for example, to Kiener (1990); Harris/Raviv (1979); Shavell (1979).
380 Eisenhardt (1989a), p. 60.
381 The normative stream strives to derive complex analytical models and system behaviors in order to evaluate the effects of incentive systems. Due to the strict nature of the assumptions,

While the normative stream of the agency theory is rather mathematical and aims at describing the principal-agent relationship from a formalized perspective, the *descriptive stream* of the agency theory has significantly stronger empirical background.[382] It concentrates on the analysis of complex institutions of organizational topics like the interaction between the owner and the executive manager and provides suggestions about how to design optimal contracts.[383]

Both approaches reflect on different aspects of the contracts between the principal and his agent, but share common assumptions. Due to its stronger empirical orientation and less restrictive set of assumptions, this study uses the frequently applied descriptive stream.

3.2.1 Issues and suggested solutions

Depending on the point in time in which the issue of information asymmetry arises, the problems of the agency model can be distinguished into moral hazard (ex-post) and adverse selection (ex-ante).[384] If the principal is unable to prevent the agent from dysfunctional behavior due to specific investments, and if information asymmetry is not the issue, the arising situation is referred to as the hold-up problem. In the following chapter, the three fundamental issues of agency theory are discussed, and it will be followed by a short summary of the potential solutions to solve them.

(I) **Adverse selection**[385] refers to the issues of unobservable agents' attributes that occur prior to contracting. The principal cannot observe all critical characteristics of the agent upfront and will learn about them only after closing the contract (ex-ante issue). The characteristics thus cannot be altered without the occurrence of significant costs.[386] Hence, adverse selection is associated with the risk of contracting an unwanted contracting partner, whose characteristics do not meet the desired standards.

AKERLOF (1970) describes this problem with the help of the used vehicle market.[387] Here, the information about the quality of a vehicle is distributed asymmetrically: the buyer of a used vehicle (principal) has no way to investigate the real quality of the vehicle, while the seller (agent) is informed about its quality. The acceptable price of the principal will range between

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organizational researchers can derive only very few outcomes for organizational design. For an overview on the analytical modeling within the normative stream, refer to Laux (2006).

382 Cf. Kieser (2002), p. 209.

383 Cf. Jensen/Meckling (1976); Fama (1980).

384 Picot et al. (2005), pp. 74-75; Nilakant/Rao (1994), p. 653.

385 Researchers also refer to this term as hidden characteristics, as the principal is unable to observe the agent's qualification or level of motivation ex-ante. Bea/Göbel (2006), pp. 159-161.

386 Cf. Picot et al. (2005), p. 74.

387 Cf. Akerlof (1970), pp. 489-490.

the price of a vehicle of bad quality ('lemon') and of good quality ('plum'). As the seller of a good quality car will have no incentive to sell at such a low price and the seller of a plum will tend to accept this mid-range price (due to the premium of the regular 'lemon' price), the remaining sellers will systematically forced to leave the used vehicle market. Adverse selection can be mitigated by either decreasing informational asymmetry or by alignment of interests. Literature suggests four fundamental solutions: signaling, screening, self-selection and incentive systems/institutions.[388]

(a) During the process of *signaling*, the agent actively provides evidence that his skills or characteristics are sufficient and worth contracting. Potentially, he employs certifications, references or previous education to show his eligibility for the task. In the case of the used vehicles market, the seller of a good quality car might acquire a certification of a vehicle supervisory company (e.g. the German technical certification authority TÜV) to show the superior quality of his vehicle.

(b) *Screening* aims at decreasing the information asymmetry in relation to the agents' attributes. It subsumes all activities of the principal to gather more information on the agents' characteristics, e.g., recruiting tests or test drives. Applied to the vehicle example, the principal could learn about used vehicles' inspection or be accompanied by an engineer to assist the principal in the decision-making process. Screening is associated with monitoring costs for the principal such as time and effort in order to decrease the information asymmetry.

(c) The principle of *self-selection* aims at designing contracts that engage the agent to choose the optimal contract alternative for himself without an interaction with the principal. Insurance companies typically try to overcome their inability to observe the individual's health status prior to contract closure using self-selection principles. By offering contractual alternatives, the agent is expected to choose the most appropriate one for his health status.[389] In the context of recruiting, the employer could communicate rigid recruiting procedures and requirements in order to prevent individuals with insufficient skills from applying.

(d) Introduction of *incentive systems/institutions*: To overcome adverse selection, the buyer of a used vehicle could negotiate a return guarantee (institution) or offer an incentive for a defined mileage (incentive system). Hence, by implementing either appropriate institutions or an incentive system, the principal ensures that a goal-oriented pre-contract behavior is in the best interest of the agent as well.

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[388] For a detailed description of all suggested solutions, refer to Macintosh (1994), pp. 32-35; Picot et al. (2005), pp. 76-80.

[389] Cf. Picot et al. (2005), p. 74.

(II) **Moral hazard**[390] refers to problems that occur after the closing of the contract (ex-post) between the principal and his agent. Moral hazard is a consequence of two potential difficulties: the principal is either not able to observe the agent's actions or he cannot judge them. Examples of limited observability are missing in the case of the principal or a physical distance has set in between both parties. The second reason is the inability of the principal to judge the actions of the agent due to missing expert knowledge, e.g., the missing medical knowledge of a patient about the actions of his physician. As a consequence of the limited observability of the agent's actions or limited knowledge of the principal, the agent follows his opportunistic nature and tends to pursue personal goals differing from those of the principal.[391] This dysfunctional behavior is also referred to as consumption on the job or shirking.[392] An initial discussion of this problem took place in the analysis of insurance contracts, where the insurance company is not able to monitor the agent's duty of care.[393] Scholars suggest two methods to cope with the moral hazard problem:

(a) *Monitoring* of agents' activities by personal contact or information systems: by monitoring agents' actions, the principal increases the information available ex-post and restricts the ability of the agent to shirk. Potential monitoring activities encompass managerial accounting, controlling or specific reports on agent's actions.

(b) *Alignment of interests* uses a mechanism where the interests of both parties converge. For example, this could be achieved by developing a specific contract with a satisfaction clause or the potential loss of reputation in case of misbehavior.

(III) The problem of **hold-up** is not characterized by an informational asymmetry between both parties but is "outside of the control of both the principal and the agent."[394] Although able to observe a dysfunctional behavior of the agent, the principal is not able to switch to another agent as he made a specific investment and hence is constrained to retain the agent.[395] The problem of hold-up could be illustrated in the course of a software development project. Although the manager (principal) contracted a developer to perform a programming task, he observes insufficient behavior and deficiencies during execution (no information asymmetry); but due to the agent's development know-how for this specific development task and the lack of developers on the job market, the principal is unable to replace him. Besides this lock-up between the principal and the agent, there is another problem leading to the incompleteness of contracts–as the principal is not able to define the contract with his agents to the utmost detail,

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390 Researchers also refer to this term as *hidden information* or *hidden action*, as the principal is unable to observe critical information to his personal welfare or agent behavior during execution. Bea/Göbel (2006), p. 160.

391 Cf. Macintosh (1994), pp. 30-31.

392 A detailed review of shirking on the job can be found in Auster (1979).

393 For a study on the application of principal-agent theory in the insurance market, refer to Spence/Zeckhauser (1971); another example in Macintosh (1994), pp. 32-33.

394 Cf. Nilakant/Rao (1994), p. 655.

395 This is in line with the findings of TCE; for a discussion also refer to Kieser (2002), pp. 228-229.

hold-up situations occur. In case the development of fully comprehensive contracts were possible and enforceable in a court of law, the problem of hold-up would be irrelevant.[396] But due to various uncertainties and the associated contract development costs, contracts remain to contain gaps that would have to be decided by a court.

Two potential solution mechanisms address the issue of hold up:

(a) First, by *aligning interests* of both parties, the agent is incentivized to develop a solution with the principal to overcome the situation of incomplete contracts.[397]

(b) In addition to the *avoidance of contract*, *specific investments* limit the potential impact of specific investments in certain agents.[398]

The issue of hold-up and solutions offered are strongly associated with the discussion of specific investments in TCE.[399] However, it never gained significant impact in the context of agency theory.[400]

Figure 9 summarizes the discussion by contrasting the three presented problems and the associated solutions.

Criterion	Adverse selection			Moral hazard		Hold-up	
Information problem principal	Characteristics of agent are not observable prior to contracting			Effort of agent to achieve goals can not be observed in situ		Incomprehensiveness of contracts	
Source of problem	Hidden characteristics of the agent			Inobservabilability of agents' actions (hidden information)		Specific investments in individuals	
Horizon	ex-ante			ex-post		ex-post	
Suggested solutions	Information increase through Signaling/ Screening	Information increase through Self-selection	Alignment through Incentive systems	Alignment through Incentive systems	Information increase through Monitoring	Alignment through Incentive systems	Avoidance of specific investments

Figure 9: Theoretical suggestions from agency theory[401]

The major underlying assumption of the agency theory is that a decrease in agency costs is favorable and results in an increased organizational performance.[402] Organizations tend to select the optimal contract situation based on the contingency factors. If organizations,

396 Cf. Picot et al. (2005), p. 75.
397 Cf. Picot et al. (2005), p. 78.
398 Cf. Williamson (1991), p. 281; Kieser (2002), p. 228; Picot et al. (2005), p. 79.
399 Cf. Picot et al. (2005), p. 76.
400 Cf. Bea/Göbel (2006)Bea, 161.
401 Own illustration building on Picot et al. (2005), p. 77.
402 Cf. Nilakant/Rao (1994), pp. 651-652.

therefore, change their contract layout in relation to their contingency parameters, they could increase the company performance.[403]

3.2.2 Critique

Agency theory complements organizational theory with the aspect of explicit and implicit contractual relationships in an organization, but is also a cause for criticism.[404] The following chapter reviews the criticism in two relevant dimensions: endogenous criticism discusses methodological issues that can be resolved, while exogenous criticism raises concerns about the fundamental validity of the theory.

Five exogenous critical issues can be distinguished, but also addressed by the theory extension:

- Opportunistic behavior in the traditional model is attributed only to the agent, and not to the principal. Nevertheless, this also occurs if a principal is, for example, changing interaction model significantly after the hiring (wages or hierarchies). Researchers extended the agency theory by introducing the concept of double moral hazard.[405]
- Contracts in the agency theory focus on the relationship between one principal and one agent, and, thus, are not covering multiple agent models. Organizational reality, however, is typically confronted with multiple agents in teams. The problems of unobservability of information and action increase in teams, as the principal is unable to observe not only individual efforts but also team results. To address this issue, research extended agency theory to multiple-agent models by designing adapted incentive schemes and control mechanisms.[406] To overcome this issue, this study chose to incorporate social control theory as a secondary theory.[407]
- Agency theory assumes the contracts to be fully specified ex-ante. Ex-post contractual conflicts resulting from adjustment or divergent interpretation of contracts are ignored in the ex-ante perspective of the theory.[408] Hence, the more complex the contractual configuration gets, the less applicable is the agency theory to the problem.
- The static view of the agency theory is another important aspect: while the agency theory assumes single-period interaction, multi-period contacts are of frequent

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403 Cf. Eisenhardt (1989a), p. 69.
404 Cf. Baiman (1990), pp. 344-345; Macintosh (1994), p. 36; Hansch (2006), pp. 78-81.
405 Cf. Cooper/Ross (1985); Agrawal (2002); Chang et al. (2003); Corbett et al. (2005); Chau et al. (2006).
406 Cf. Holmström (1982), p. 325; Kieser (2002), p. 223.
407 Refer also to Chapter 3.3.
408 Cf. Meinhövel (1999), p. 172; Kieser (2002), p. 222.

occurrence. Hence, restricting the model to single periods ignores the principal's learning and experience effects building on agent observation. From a formal, analytical perspective, an extension of the model to multiple periods is possible, but results, however, in an increasingly complex set of additional assumptions.

- Agency theory is concerned with individually negotiated contracts and does not cover externally imposed contracts such as regulatory impact of governments. However, previous research from people like MEINHÖVEL (1999) was able to integrate these regulatory aspects into agency theory.[409]

Furthermore, agency theory is criticized for four shortcomings that are theory immanent (*exogenous criticism*):

- Agency theory builds on two critical behavioral assumptions. Firstly, it assumes that the preferences or goals of agents and principals are known. The behavioral assumptions cover only opportunistic actions during execution but not the goal development process itself. Hence, in case the preferences of both contracting partners are not explicitly known, the agency model does not apply.[410] Secondly, while the assumption of entirely opportunistic behavior holds true for most western countries, less individualistic countries from, for example, South-East-Asia, potentially show a different behavioral pattern and are, therefore, not covered by agency theory.[411]
- Shirking or unwillingness is not the only cause for dysfunctional behavior of the agent. However, the possibility for a lack of respective skills is not covered by the fundamental assumptions of the model.[412]
- Agency theories' primary focus is on the contractual disadvantages in the forms of agency costs and it neglects benefits.[413] The typical approach of the management to address both costs and benefits is not applied in the theory. A contract selected only on the basis of agency could be disadvantageous even to other contracts.
- Finally, researchers point out the limited possibility to verify the suggestions empirically, as a result of the difficulties to measure agency costs explicitly.[414] However, as this study primarily employs the general contract-design suggestions from the descriptive stream instead of the formal, analytical from normative, this is of limited impact on this study. The overall applicability to the organizational sector

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409 Cf. Meinhövel (1999), pp. 171-212.
410 Cf. Spremann (1989); Göx et al. (2002).
411 Sharp/Slater (1997), while investigating the impact of sunk costs on project escalation, determine that agency theory supports findings in North America, but fails to predict behavior in Asia; see Sharp/Salter (1997), pp. 115-116.
412 Cf. Müller (1995), pp. 70-71.
413 Cf. Meinhövel (1999), pp. 108-113.
414 Cf. Meinhövel (1999), pp. 143-164; Kieser (2002), p. 224.

was accepted in organizational research[415] or as ANTHONY (1989) points out: "agency theory makes contributions to organization theory, is testable, and has empirical support."[416]

3.3 Social control theory

"Effective control is a much more complex and subtle process than the limitation of behavior by either administrative devices or the use of personal power."[417] Besides a formal relationship, all individuals of a group share a social relationship as well. The effect of this is that mechanisms resulting from these social relationships are the central element of social control theory. Typically, social control is not only exercised by superior managers but also executed by individuals on all levels over one another.

Social control processes build on a shared pattern of beliefs and expectations. These beliefs and expectations influence the development of norms that shape the behavior of individuals and groups.[418] Two effects prevail. The first is the natural tendency of an individual to reduce the difference in norms and values between him and a group and reach conformity.[419] The second is the pressure exerted by group members who realize that the individual is acting against their shared morale and value standards.[420] In contrast to formal control processes, the social control processes are initiated by the individual or other group members rather than an external stimulus from a superior manager. The advantage of social control is its perceived lower level of external authority: "With formal systems people often have a sense of external constraint which is binding and unsatisfying. With social controls, we often feel as though we have great autonomy, even though, paradoxically, we are conforming much more."[421] Early empirical research found that individuals' acceptance and the relationships between workers are more important than economic incentives offered by the management.[422]

The concept of social control was first developed in the research field of behavioral sciences and sociology, where it describes the individual's changes in norms and values after his integration into a group. The term 'social control' was first used prominently in the writings of ROSS who, while working at Stanford University in 1894, realized that the idea of social

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415 As a result, numerous research efforts from various disciplines used the approach and it found its way into various text books for academic education. For an exemplary application to organizational problems refer also to Laux (2006), pp. 1-19.
416 Eisenhardt (1989a), p. 70.
417 Cf. Hopwood (1976), p. 27; Türk (1981), p. 44.
418 Cf. O'Reilly (1989), p. 12.
419 Cf. Türk (1981), p. 45.
420 Cf. Hopwood (1976), p. 30.
421 O'Reilly (1989), p. 12.
422 Cf. Roethlisberger/Dickson (1939), pp. 554-558; in the same sense developed by Homans (1992).

control serves him as a "key that unlocks many doors."[423] He used his concept to explain in detail how men "live closely together and associate their efforts with that degree of harmony we see about us."[424] After his detailed reviews on the exact mechanisms of social control, the topic was further developed in the upcoming research stream of sociology.[425] Besides the usage in sociology, the theory of social control was used extensively in the field of criminology to explain why (the reasons other than punishments) men do not commit crimes.[426] Social control theory finally found its way into management, when OUCHI derived a framework on how to integrate social control into the management of organizations.[427]

The core definition of social control considers it as the sub-conscious processes to increase or establish conformity within organizations or groups.[428] After being exposed to new values or stances, the individual reflects, internalizes and finally adapts to the formerly external values. Besides this mechanism, social control also induces external control by building up peer pressure from colleagues that do not accept the individual's deviation from the norms and values of the company. Implicitly, the theory of social control includes a comparison between two normative systems–one of the individual and the other of the organization.[429] The two research objects of the theory are the individual and the organization. However, the direction of adaptation is assumed to initiate from the group to end at the individual. An adjustment of the group norms based on external impulses is not suggested by the social control theory. This process of adapting to defined values can also be described as a learning process[430] or secondary socialization of humans.[431]

Researchers even argue that the level of required formal control decreases with increasing social control: "The more effective the selection, the less need for socialization, the more

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423 Ross was technically not the first author to cover the topic control in the behavioral sciences. Spencer in his work in 1892 already used the term 'control' (Spencer (1892), p. 115) but did not give it a special importance in his research. Based on his research, Ross was inspired to develop the topic of social control and developed his ideas further. For details, see Spencer (1892); Ross (1901); Ross (1936).

424 Janowitz (1975), p. 89.

425 Social control theory gained significant importance in the field of sociology and was considered to be a core concept to analyze social organizations at that time. See Janowitz (1975), p. 89.

426 Cf. for example Reiss (1951).

427 Cf. Ouchi (1979).

428 For this definition see Dalton/Lawrence (1971), p. 13; Ouchi (1979), p. 845; O'Reilly (1989), p. 12; Sjurts (1995), p. 53.

429 Sjurts (1995), p. 54.

430 Cf. Berger/Liuckmann (1980) and Schein (1971).

431 Cf. Hebden (1986); Louis (1980). Mintzberg (1983), p. 41 uses the term of indoctrination that he defines as "the label used for the design parameter by which the organization formally socializes its members for its own benefit."

effective socialization, the less need for supervision."[432] Some even propose that social controls could be the primary basis of control in organizations.[433]

Behavioral assumptions. Social control theory builds on two key assumptions. First, it assumes the relevance of social acceptance and recognition for humans in their workplace.[434] Scholars showed that employees work significantly more efficiently if they cooperate in an environment of respect and appreciation with their colleagues and superiors than in a workplace with strict rules and limited social interaction.[435] In this context, social control theory expects the employees to behave in the sense of the social-man and not the homo-economicus as proposed by agency theory. SCHEIN (1980) describes this in the sense that the motivational structure of working humans is not only induced by the specific work they are performing but also by the acceptance and positive relationship to their colleagues.[436]

Secondly, social control theory assumes that employees accept a certain change of their personal norms and values. While being confronted with conflicting attitudes, individuals are willing to change themselves to a certain extent. Only if this threshold of accepting personal change exists, will social control theory affect a person's behavior. The mechanisms, goals and processes are explained by the social control theory itself, but rely on the basic premise of the 'willingness to change' of the employee.

3.3.1 Issues and suggested solutions

Social control theory aims at explaining how individuals act in social groups and how their behavior can be influenced. Therefore, the main concern of the theory is a sociological understanding of adaptation effects within groups.[437]

Building on sociology, social control theory describes two primary mechanisms by which social control influences organizations: first, the social regulatory effects of the group, and second, the anticipatory effects of the individual for social control.

(I) Primary effect mechanism is the socialization of the individual with the established rules and values and the adoption process. The individual, hence, adjusts his personal values, beliefs and attitudes; he also learns, adopts and internalizes the values and finally identifies

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[432] Etzioni (1965), p. 657.
[433] Ouchi (1979), p. 837.
[434] Cf. Hopwood (1976), pp. 28-29.
[435] Cf. Roethlisberger/Dickson (1939), pp. 517-521; Steinmann/Schreyögg (2005), pp. 60-63.
[436] Cf. Schein (1980), pp. 56-59.
[437] Social control theory is a concept that describes effect mechanisms of social control rather than associated problems (in comparison to the problem of moral-hazard in agency theory). Hence, it rather focuses on the preconditions for social control and how it affects the individual's behavior.

himself with the corporate values.[438] This process can both occur implicitly without group interaction but as well after a small 'kick-start' from other socially adopted group members: "When someone deviates from these norms, he may be good-naturedly kidded about it at first, but if it is an important norm to the other members of the group, the kidding will get a sharp edge to it and may be escalated into ostracism and hostility if the deviator doesn't swing back in line"[439] As outlined above, a minimum level of willingness to adapt is required for social control to have an effect on employees.

To ensure this, organizations specifically select their new employees to match this requirement. On the one hand, employers could choose to specifically hire employees who already match their required profile in relation to their norms and values.[440] However, only a minor percentage of potential employees are expected to already share a majority of norms and values. On the other hand, organizations choose to hire new employees based on their expected adaptability to conformity. They may not already share the same norms, but as they are shown to have been adaptable during education, in their personal life or during previous employments, they are expected to behave accordingly again.[441]

(II) The second effect of social control is anticipation. As new employees observe social norms and realize their existence, they are expected to anticipate the related social pressure to enforce them.[442] Consequently, employees are assumed to adjust their behavior accordingly before even interacting with other group members. This effect can also be associated with self-control, as the individual compares his own behavior against the norms and values of the organization and derives countermeasures to conform to the general norms.

After discussing the key mechanisms, the levers for management are now reviewed further. As the function of self-control cannot be triggered directly by management, two solutions to influence employee behavior emerge:

a) *Shaping corporate norms and values.* By explicitly determining the desired corporate norms, as well as bringing them into the organization, managers are able to shape a corporate culture that, once deployed, initiates social control processes.[443] Initiating and building norms takes different facets and tools, ranging from behaving as a role-model, and specific staff communications all the way to training and feedback

438 Cf. Türk (1978), p. 129.
439 Dalton/Lawrence (1971), p. 14.
440 This requires (i) an explicit knowledge of the required values of the company and (ii) a dedicated process of employee selection to ensure minimum errors in the different levels of selection.
441 While this selection process could be expected to be directed only from the organization to the individual, previous research found that employees also select their future employer based on the adaptability of his personal norms with the organization's.
442 Cf. Türk (1981), p. 49.
443 Cf. Hopwood (1976), pp. 25-26.

processes. As the individuals are confronted with the corporate norms and face potential social control processes, proleptic effects are initiated as a result.

b) *Personnel selection processes*: The second key mechanism is the selection of human resources that are expected to be susceptible for social control effects and open for conformity adoption (capability control).[444] Despite the fact that susceptibility for social control is a complex attribute, it can be evaluated like the capacity for teamwork or any other social skill using techniques from rigid interviews and educational background to role plays.

Hence, two mechanisms were identified to increase employees' adoption to corporate values and, thereby, to influence employee behavior. These mechanisms can be attributed to different control forms in the research framework and are integrated into the framework in the following chapter.

The *performance effect* of social control builds on the assumption of an optimized usage of the existent organizational resource base. As outlined in the conceptual foundations of control,[445] the aspect of efficient resource allocation enables organizations to achieve their strategic goals with minimum levels of resources involved and, thereby, ensures effective execution of strategies and plans. In addition, conformity and social acceptance are expected to raise individuals' motivation and hence improve outcomes. Although social control theory does not predict enhanced performance as its main objective, the outcome – an adoption process of employees – supports the optimal resource allocation that finally results in increased organizational performance.

In relation to *control combinations*, social control is expected to interact with other controls in a substantial way. On the one hand, control practices that focus on selecting human resources with a matching skill, motivation and experience set are expected to support social control, as they can ensure a minimum level of adaptability.[446] On the other hand, previous researchers argue that internalized norms are able to replace formal control mechanisms.[447] An application of both practices together is, therefore, expected to be beneficial as well.

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444 Cf. Etzioni (1965), p. 657; Hopwood (1976), p. 25; Ouchi (1979), pp. 840-841.

445 Especial focus on the performance effect of control is described in Chapter 2.2.4.

446 Personnel selection reduces the need for social control during organizational membership, as it selects employees who are expected to adapt to social norms. Consequently, in order to execute social control, less effort is required to influence individuals' behavior.

447 Cf. Skinner (1971), p. 84; Merchant (1985b), pp. 40-43.

3.3.2 Critique

Limited critique has been developed of the social control theory in the context of management control. Potential critique could be articulated in terms of (i) the applicability to management control in general and (ii) the assumption of employees being 'social-men.'

First, critics could argue that despite its explanatory power for social processes, it does not apply to management control, as a consequence of the limited suggestions of enforceable management techniques. Instead, it focuses on the mechanisms behind techniques that drive individuals' behavior and interaction with others. But although less accessible than other theories, it developed a body of previous research that describes consequences for organiational application as well.[448] As the theory contributes to the explanation of the effects of socialization in the context of an organization and as these effects can be observed in organizations, this study assumes its applicability to management control.

Secondly, one could question the assumption of employees being social-men. The alternative is to assume employees to be 'homo oeconomicus' or 'rational economic man' that is primarily motivated by monetary incentives and intrinsically maximizes his personal welare.[449] Feelings or social interaction are not part of his motivational structure and are hence neglected in this economic model.[450] In this case, the mechanisms described in social control theory by JANOWITZ would not apply. However, the view of men as social men acquired broad acceptance and was even further developed into the concept of "self-actualizing men."[451]

Hence, as the consequences of social control can be observed in organizations and as employees are actually considered to behave like social men in SMEs, social control theory will be applied during the course of this study.[452]

3.4 Application of the research framework

After selecting and describing both theories, the study now aims at integrating them into one theoretical framework and applying it to the overall research problem of management control in SMEs. The related issues raised in the theories are then discussed to illustrate their

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448 For an example on the practical application in the area of leadership, see Türk (1981), pp. 126-188.

449 Cf. Brentel et al. (2003), p. 117.

450 Cf. Schein (1980), pp. 53-54.

451 Cf. Brentel et al. (2003), pp. 116-117.

452 Even if individual employees would not behave like social men, socialization mechanisms would apply to the remaining men that would then start to initiate countermechanisms to the actions of the individuals. For the regulatory effects of society on indivuals refer to Ellickson (1987), pp. 69-70.

contribution to the overall research problem. Finally, the two theories and related suggestions are integrated into one approach that is matched against the management control forms presented by the research framework of MERCHANT in Chapter 2.2.2.3.

3.4.1 Contributions to the problem of MCS in SMEs

Within SMEs, there are numerous *principal-agent relationships*.[453] In the manager-subordinate relationship, the manager delegates tasks to his subordinates to implement and execute planned tasks. Hence, the problem of information asymmetry arises, as the manager is not aware of all the information required to implement the tasks successfully or prevent his subordinate from shirking. In addition, employees can be expected to bear a certain opportunistic behavior and have interests different from those of their supervisor.

Besides the agency assumptions, the issues presented by agency theory are of particular relevance for this study as well. (i) As the manager typically receives no or limited information on the effort put into activities by the agent during implementation, the issue of *moral hazard* arises. An agent could easily lower his efforts of implementation, without being realized by the principal. (ii) At the same time, the skill set and attitude towards pursuing and achieving organizational goals is not transparent to the principal prior to employment. A potential employee (agent) interested in contracting with the principal is not interested in revealing full information on his qualifications and, hence, is subject to the problem of *adverse selection*. (iii) Finally, in case the employer is bound to an employee, although the employee obviously does not perform the tasks as agreed upon, the issue of *hold-up* potentially applies well. Due to the validity of both the underlying agency assumptions and the three agency problems, agency-theory is expected to deliver valuable insights for this research study.

On the other hand, SMEs are characterized by a *social interaction* between the individuals. The dominance of the owner-manager and low degrees of formal organization lead to frequent interaction amongst group members. In fact, certain advantages of SMEs, such as quick decisions and innovative products, are a consequence of high levels of interaction amongst the employees with all their related social aspects.[454] Especially, the low degree of formalization, with all its associated aspects such as the requirement to develop processes, builds informal structures and the requirement to cooperate with other employees to solve organizational issues, and fosters social interaction within the entity.[455] Hence, individuals within SMEs are

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[453] Besides the relationship covered in this study, numerous other relationships exist: investor vs. top-manager, team leader vs. employee, or headquarter vs. foreign branch.

[454] Cf. Pichler (1997), pp. 24-25.

[455] Cf. Pichler (1997), p. 12.

expected to interact in a social way and a theory covering this aspect will provide valuable insight for this research study.

Although agency theory provides a solid understanding of the design of controls in organizations, it is deficient in its explanatory power in the aspect of social relationship amongst organization members. Or as EISENHARDT points out in her renowned paper on agency theory, it "ignores a good bit of the complexity of organizations."[456] To address this issue, this study specifically builds on her proposition to turn to other social science disciplines, by complementing agency theory with social control theory. Using two theoretical frameworks in an integrated way allows this study to deal with the characteristics of SMEs and to derive hypotheses for all four control forms. Both theories are valuable especially in their combination, as both cover rich areas of management control, in particular, the differentiation between formal and informal control.

3.4.2 Relationship between theories and control forms

Integrating both theoretical concepts into one research framework enables us to predict the effects of management control. This is achieved in three steps. First, the issues and aspects covered by both theories are integrated, as they are relevant to the research objects. As outlined in the paragraph above, all four issues raised in the theories apply to SMEs and the function of management control. Hence, they are considered being equally relevant to this study and are used to describe the overall situation. Second, the related suggestions to solve these issues are incorporated into an overall theoretical framework. Each theory suggests different mechanisms ranging from alignment of interests over monitoring activities up to personnel selection processes. The suggestions are then clustered by their related problems. During the final step, the proposed management control forms are mapped against suggested solutions to show how management control can address the overall questions. Each management control form, as derived from the management control framework of MERCHANT, is then evaluated in relation to its contribution to the different solution elements.

There is a manifest rationale behind this approach. As the suggested solutions of the two fundamental theories have been developed and empirically tested by a number of previous scholars, they can be considered established. In case this study is able to match the proposed management control forms against the previously established and accepted solutions, a direct effect of the control forms, as proposed by the fundamental theories, can be assumed. In the following paragraphs, both theories are presented in their relationship to describing the different control forms.

[456] Eisenhardt (1989a), p. 71.

As outlined in Chapter 3.2, **agency theory** addresses three problems and presents potential solutions for the problems: (i) moral-hazard – monitoring and alignment of interests, (ii) adverse-selection – signaling, screening & self-selection, and (iii) hold-up – alignment of interests.

- *Results control* in essence consists of setting specific targets for individuals and following up on their achievement. It can also be understood as an alignment of interests between the principal and the agent by designing an appropriate incentive system for the agent: only in the case where the employee reaches a minimum level of performance will he receive the defined incentive. By this means, the principal aligns his interest with the agent's opportunistic desire to increase his personal welfare. This allows the principal as well, to ex-post monitor the performance of the agent and to act accordingly, by adjusting goals or work parameters during the subsequent work sequence.
- *Behavior control* relates to monitoring employees behavior. By defining standard operating procedures, the principal/manager can efficiently monitor his agents' behavior against these standards. The initiation of this form of control also results in a limitation of the individual's decision space and constraints his behavior. Therefore, behavior control can be regarded as a manifestation of solutions, among others, of the moral hazard problem.
- Detailed recruiting and development processes are part of the concept of *personnel control*. It addresses the solution of the adverse-selection problem by intensifying the screening process. Detailed interviews and skill profile matchmaking processes ensure that the potential employee matches both explicit and implicit company requirements. The communication of the agent during the application process can also be understood as a form of signaling. By showing his technical skills and personal attitudes in his application and the interviews, he actively presents the desired characteristics to the potential employer.

Social control theory, on the other hand, depicts the effects of socialization and the resultant control effects in organizations. It delivers two basic propositions for management control. First, it describes the importance of selecting employees who (i) already match the required norms of the group and values or (ii) who are open to adapt them. This process of selecting the best-matching human resources can also be understood as a function of *personnel control* over the workforce. Second, the theoretical framework describes the effect of commonly accepted norms on the behavior of individuals and the desire of men to reach conformity. *Cultural control*, by its core means, aims at designing and communicating behavioral norms

and values to employees and, thereby, influencing them. Hence, cultural control can also be linked to the mechanisms of social control theory.[457]

The relationship of the theoretical frameworks, suggested solutions and related management control forms are summarized in Figure 10. The leftmost column represents the two frameworks and the related proposed solutions. The x-axis of the summary shows the four proposed management control forms. Every proposed solution from the theoretical framework is related to a certain management control form, while their relationship is represented by a tick mark. The figure illustrates that all four management control forms can be linked to suggestions from the chosen theoretical frameworks.

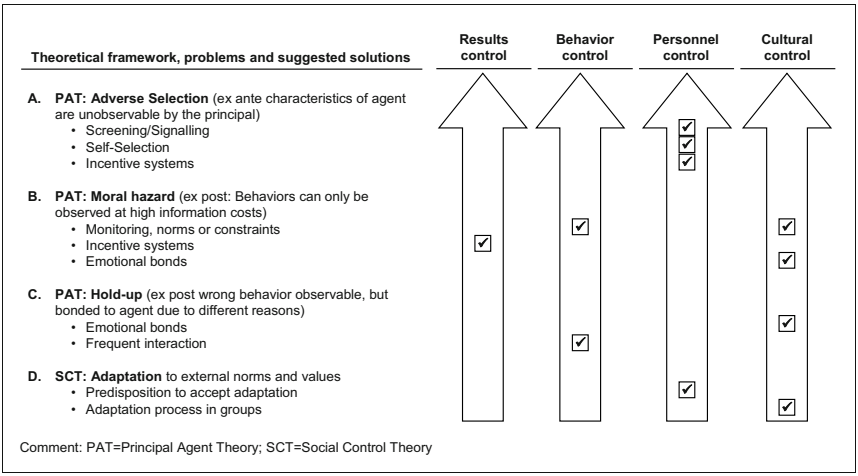

Figure 10: Conceptual relationships between control theories and research framework[458]

In summary, this sub-chapter described how the two selected theories, agency and social control theory, can be used to describe the consequences of management controls. By addressing critical management issues that are part of the concept of management control in SMEs, both theories add significant conceptual value to this study. To determine the effects of each individual control forms, the control forms are then matched against previously suggested solutions. All four management control forms are expected to have an influence on

[457] Agency theory could also be linked to cultural control: although primarily developed to describe formal contracts, conventions and shared norms could be considered as non-formal contracts that constrain individual behavior. (For formal vs. non-formal contracts see also Rees (1985), p. 3; and Sjurts (1995), p. 35.). But as social control theory was specifically developed to cover cultural and social elements, it can be easily applied to this study.

[458] Own illustration.

organizational performance, as they all contain important aspects of the theories. Hence the next step is to formulate hypotheses to test the assumed effects against empirical data.

A variety of potential theories were reviewed to explain the effects of management control on company performance. After comparing the available theories with the requirements put forward by the research design, a detailed selection process reveals two frameworks that fit the objectives best. Both theories, agency theory and social control theory, are then reviewed with regard to their concept, assumptions and offered solutions for control. By matching the proposed theories to the chosen management control framework by MERCHANT, this study suggests a positive effect of the different management control forms on company performance. In addition, the combination of the control forms is expected to be beneficial in comparison to the use of a single form. As the theoretical foundation for this study is defined now, the following chapter develops the hypotheses and the research model.

Despite the conceptual applicability of both theories to the research problem, academics critizice agency theory as it "ignores a good bit of the complexity of organizations."[459] At the same time, agency theorists argue that it is "hardly subject to empirical test since it rarely tries to explain actual events."[460] Consequently, in addition to using both theories as a theoretical foundation, this study also aims at contributing to the ongoing theoretical discussion about its applicability to management control. By using agency theory and complementing it with the concept of social control theory, this study seeks to provide empirical evidence for the suitability of both theoretical concepts. To achieve this, both theories are used during the hypotheses formulation and finally are evaluated at the end of the study with regard to their theoretical contribution to the overall research questions.

[459] Eisenhardt (1989a), p. 71.
[460] Perrow (1986), p. 224.

4 Hypotheses and research model

This study aims at answering four distinct research questions. Firstly, this study seeks to provide evidence for the beneficial effect of indirect controls on company performance. The hypotheses for all four control forms are thus developed in Chapter 4.1. Secondly, the assumed consequences of control combinations are described in Chapter 4.2. Thirdly, the hypotheses for research questions two and four, which concern age (research question two) and other life cycle oriented moderators (research question four) are discussed in Chapter 4.3. Finally, Chapter 4.4 combines the hypotheses and presents the overall research model.

4.1 Direct effect of management control forms

This study employs a three step approach for its hypothesis development. First, it builds on theoretical considerations to determine the linkage between the chosen theoretical framework and the management control framework. Then, it presents relevant empirical research from large corporations and related disciplines. Finally, findings from the SME literature complement the hypothesis formulation.

As outlined in Chapter 3.4, this study uses agency theory to determine the effects of management control forms on organizational performance. To complement agency theory and to account for the focus on indirect forms of control, social control theory is considered as a second theoretical foundation. The fundamental assumption of this study is that the four management control forms can be attributed to the solutions provided by the agency and social control theory. The conceptual relationships used to derive hypotheses are summarized in Figure 10.

Each management control can be considered to build on different solution techniques from the theories. For example, the overall concept of personnel control consists of techniques that address issues both from the problem of adverse selection and ensure the predisposition to adapt to external norms. Executing management controls will, therefore, reduce or eliminate the presented issues. By addressing the underlying problems, management control exerts influence on employees' behavior and aligns it with the company's overall objectives; in turn, this is expected to improve organizational performance due to the increased resource effectiveness. The following chapters build on this assumption, explaining how management control forms are associated with the suggested solutions and linking it to previous empirical results.

4.1.1 Results control

4.1.1.1 Theoretical considerations

Results control influences organizational actors by measuring the results of their work efforts and incentivizing them in the case of target achievement. The process of how to achieve defined targets is not predetermined and is to be defined by the agent. The encouragement to ensure goal consistent behavior in this case is the *incentive system*. Results control addresses the agency issue of *moral hazard*. As the principal cannot observe all agents' actions he uses an incentive system to partly transfer risk to the agent and provides him with freedom to pursue the goal without further interaction.

By using an incentive system and only a little interaction, the principal is able to reduce his overall control costs, while ensuring an alignment of interests. The overall control costs are expected to be moderate, as the agent, besides taking the risk of underperformance, has only negligible control or signaling costs.

SME related liabilities. As the fundamental mechanisms of interest alignment remain identical in small organizations, the characteristics of SMEs are not expected to influence the positive effects of results control.

4.1.1.2 Results control in large organizations

Previous research on results control can be attributed to both the field of accounting (budgeting, performance measurement) and incentive systems. Hence, research from both areas is considered in this study.

Accounting. OTLEY (1978), in an early study of the evaluation practices of managers, found that there is a "considerable interaction between the style (loose vs. tight to budget), budget accuracy and unit profitability."[461] Similarly, MERCHANT (1981) found a positive relationship between budgeting practices and corporate performance in the electronics industry. This performance effect even increased in large corporations.[462] While investigating the effects of external uncertainty on the relationship between budgeting systems and company performance in 440 publicly held Taiwanese companies, DUH ET AL. (2006) found a positive effect of budget updating frequency, finance personnel participation and lower-level manager involvement on self-reported company performance.[463]

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461 Otley (1978), p. 146.
462 Cf. Merchant (1981), p. 813.
463 Cf. Duh et al. (2006), p. 353.

Incentive systems. Previous research on results control yielded considerable information on organizational performance. HILTROP (1996), for instance, found that an incentive based compensation system has positive effects on product quality, change acceptance and firm performance.[464] For large manufacturing, construction and retailing firms, BHARGAVA (1994) was able to show a small positive effect of profit-sharing programs on the financial performance.[465] Besides the employee level, the performance effect of an incentive system too showed to be valid for executives as well. LEONARD (1990), by using the data from 439 large U.S. enterprises, found that long-term incentive plans result in significantly greater increases in return on equity than companies without such plans.[466] Retained profits and bonus payments were shown to be a driver of success in other countries as well. YAO (1997), in his study on 400 state-owned enterprises in China, was able to show that the productivity growth was primarily driven by the incentive system in the organization.[467]

Contrasting the previous positive findings, results control can also have a dysfunctional effect on performance. Despite the suggestions from agency theory, authors have noted that just the opposite may occur.[468] Since results control requires the subordinates to bear more risk for the firm, they potentially take safer courses of action, pursue short-term oriented opportunities and neglect long-term innovative opportunities.[469] For example, in line with the previous results of SNELL/YOUNDT (1995), LIAO (2006) shows in her study on HRM controls that results control was not associated with a positive impact on performance in her sample of 215 large Taiwanese corporations.[470] Following the previous results and conceptual considerations, outcomes of results control are ambiguous and can, at the same time, be both beneficial and dysfunctional. In order to reconcile this contradictory statement, the aspect of "crystallized standards of desirability"[471] is taken into consideration. Previous research revealed that results control is typically used when standards of desirability are clear and performance-standards well defined.[472] In the opinion of the author, the findings of SNELL ET AL. are in fact a consequence of the choice of large organizations. In comparison to SMEs, large multidivisional organizations have highly complex operations and a large amount of

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464 Cf. Hiltrop (1996), p. 17.
465 Cf. Bhargava (1994), pp. 1049-105.
466 Cf. Leonard (1990), p. 26.
467 Yao (1997), p. 294.
468 Cf. Jaeger/Baliga (1985), pp. 127-128; Snell/Youndt (1995), p. 715 and 729.
469 For example, Rost/Osterloh (2007) conducted a meta-analysis of 75 studies (covering 123,797 companies). They found a negative impact on company performance as a consequence of a pay-per-performance of CEOs. For a discussion on the potential reasons for the remaining application of pay-per-performance, refer especially to pp. 14-16.
470 Cf. Liao (2006), p. 194.
471 Thompson (1967), p. 84; also referred to as outcome measurability by, for example, Ouchi (1977), p. 105.
472 Cf. Hofstede (1978), pp. 455-456; Ouchi (1977), p. 105; Ouchi (1978), pp. 843-844.

resources. The development of "crystallized standards of desirability" is expected to be rather difficult and complex for such a large variety of different businesses.

However, as this study investigates the effects of results controls in SMEs, with comparable smaller management ratios, rather focused resources and less organizational complexity, results control is expected to retain its positive effect on organizational performance.

4.1.1.3 Results control in SMEs

Budgetary control is not only helpful, but especially important for SMEs. WIJWARDENA ET AL. (2004) found that significantly more companies were able to increase sales in case they were using simple or sophisticated budgets in comparison to companies that do not use budgets.[473] In the same fashion, building on US sample of SMEs, CARLSON ET AL. (2006) revealed that organizations with a strong sales-growth performance were using cash incentive compensation to encourage and motivate their employees.[474] Especially, firms in the early phases of a life cycle have to decide whether to implement budgets or use their management resources for other topics. While investigating the effects of adopting budgetary control in young enterprises, DAVILA/FOSTER (2005) showed the beneficial nature of budgetary control: They find "a positive association between the adoption of operating budgets and company growth for early-stage companies."[475]

As results control can be understood as a combination of established measures to address the problem of moral hazard in the agency theory, this study hypothesizes a positive effect on the overall company performance. Empirical studies from both small and large organizations, suggest a positive performance as well.

> *H1a) Results control usage intensity is positively related to the company performance of SMEs.*

4.1.2 Behavior control

4.1.2.1 Theoretical considerations

Behavior control influences an individual's behavior by implementing and tracking standard procedures, behavioral restrictions and frequent interactions. Managers introduce review

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[473] Using ANOVA analysis, found "that only 34.5% of the firms with no written budgets were able to increase significantly or slightly the sales over last three years, while 54.8% of firms using simple budgets and 75.1% of companies using detailed budgets achieved similar increases in sales." Cf. Wijewardena et al. (2004), pp. 213-214.

[474] Cf. Carlson et al. (2006), pp. 538-540.

[475] Davila/Foster (2005), p. 1065.

meetings with employees or design work systems which allow proceeding further only if standard procedures are met. By tracking the behavior against defined standards, behavior control can be associated with the concept of *monitoring* in agency theory to solve the problem of moral hazard and to decrease the information asymmetry between principal and agent. Behavior control also has a secondary effect: by meeting and reviewing the intermediate steps of the target achievement process, the principal builds up a personal relationship with his employee and realizes unexpected behaviors such as skill-set deficiencies earlier. Such a frequent and *personal interaction* can also be understood as a technique to reduce the impact of the *hold-up* issue. Behavior control is associated with significant control costs, as it typically involves interaction efforts for the principal as well as significant signaling costs for the agent for review preparation. However, as it can be associated with solution mechanisms of agency-theory, its effect on employee's behavior and subsequently the organizational performance is expected to be positive.

SME related liabilities. In relation to the performance effect of behavior control, the liabilities of SMEs are expected to be significant. Firstly, the liability of smallness, resulting in an overall shortage of resources, impacts behavior control and reduces the principal's ability to spend time on intensive employee interaction: the principal's cost for frequent interaction with his subordinate employees is significant, especially considering the principal's opportunity costs of strategy development or other management activities. Secondly, the strong cohesion between members of SME and adequate level of independence is potentially decreased by the implementation of behavior control systems. As they are typically perceived as the most direct control form, an application potentially results in a decreased level of motivation, entrepreneurial orientation and subsequently overall performance.[476]

4.1.2.2 Behavior control in large organizations

To focus the discussion, three relevant studies are presented, which have investigated organizational performance consequences of behavior control. No significant effect of behaviour control usage on individual sales performance was found by Jaworski et al. (1993) while analyzing sales & marketing MCS.[477] In relation to the effectiveness of behavior control in large organizations, SNELL/YOUNDT (1995) found the peculiar importance of behavior control intensity executed by executives for the Return-on-Assets and sales growth. As previously suggested by OUCHI (1979), they also found that the effect was moderated by a thorough understanding of process details and cause-effect relationships in their subordinates'

[476] Particularly, the decreased performance materializes in the principal-agent model as welfare costs; they describe the difference between the optimal and the second best solution of a principal-agent situation. Picot et al. (2005), p. 73.

[477] Cf. Jaworski et al. (1993), p. 64; in a similar research setting Cravens et al. (2004a); Baldauf et al. (2005).

working environment.[478] In her study on human resource practices in Taiwanese companies, LIAO (2005, 2006) found a positive effect of behavior control on company performance. However, the results were moderated by corporate strategy and organizational life cycle stage.[479] In essence, the findings suggest an effect on company performance.

4.1.2.3 Behavior control in SMEs

SME literature discusses behavior control in the context of feedback or performance appraisals. Authors focus on, however, on the group interaction or psychological consequences. To the best of the knowledge of the author, there is no current paper investigating the direct effects of behavior control on performance. Research on HR practices in SMEs rather omitted these practices and focused on HR topics like training/development, recruiting or morale issues.[480] In comparison to the other three control forms, behavior control is rather 'underresearched' at the moment.

Adoption of behavior control elements is considered to be extremely beneficial. JONES ET AL. (1993) investigated the consequences of the introduction of monthly feedback meetings and performance reviews on a small retail corporation. They found that the adoption of the feedback meeting was associated with a performance increase of the department.[481] In line with this, DAVILA/FOSTER (2007) found that start-ups implementing control tools (behavior control tools is part of it) early in their life-cycle were more successful in comparison to late-adopters.[482]

To confound the hypotheses further, this study also reviewed adjacent areas of management research and found evidence in the field of total quality management (TQM). As one of its elements is a strong process orientation, it can be used to draw a conclusion on behavior control from it. In the context of TQM implementation, TAYLOR/WRIGHT (2003) show that a decrease in the time-to-adoption of TQM techniques is associated with an increase in subjective company success.[483] CHANDLER/MCEVOY (2000) found that the behavior/process oriented management approach of TQM was associated with a positive performance impact if supported by personnel control techniques. However, TQM showed no effect in the direct model without interaction.[484]

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478 Cf. Snell/Youndt (1995), pp. 720-724.
479 Cf. Liao (2005), p. 301; Liao (2006), p. 194.
480 Cf. Carlson et al. (2006), pp. 537-539; a review on HRM practices in SMEs also shows no elements of behavior control. Cf. Heneman et al. (2000), p. 14.
481 Cf. Jones et al. (1993), p. 287.
482 Cf. Davila/Foster (2007), pp. 921-939; however, behavior control is only one element of the MCS.
483 Cf. Taylor/Wright (2003), p. 104.
484 Cf. Chandler/McEvoy (2000), p. 51.

To sum up, despite the low amount of empirical evidence on a performance effect for SMEs, the fundamental principles of agency theory and the beneficial empirical findings in large organizations still suggest a similar positive effect of behavior control on performance and, therefore, state:

> *H1b) Behavior control usage intensity is positively related to the company performance of SMEs.*

4.1.3 Personnel control

4.1.3.1 Theoretical considerations

One of the major problems in the agency framework is adverse selection. It describes the difficulties of a principal to judge the characteristics of an agent prior to contracting. By implementing personnel control and the associated techniques as described in Chapter 2.2.2.3, it addresses three potential solutions of the problem: first, by implementing rigid interview and recruiting procedures, the principal engages in a detailed *screening* process; second, by setting minimum levels of qualification and encouraging the agents to present their skills during the recruiting processes, agents are engaged in a *signaling* activity to reduce the information asymmetry of the principal; and finally, as more and more agents understand the required skill set for the position, one can assume that the ones not meeting the skill requirements will not apply for the job, due to fear of rejection and, therefore, there will develop *self-selection* activities. As personnel control encompasses three different suggested solutions for the agency issue, this study assumes the concept of personnel control to be a solution as well. Building on these findings and considering personnel control a solution, this study assumes personnel control to have a positive effect on company performance.

Personnel control can theoretically be understood from another perspective as well: in the concept of *social control theory*, it ensures that either new the employees already share certain norms, values and principles or just show the potential to adapt to them. In this concept, personnel control builds the foundation for cultural control: personnel control ensures that new employees are accessible for the effects of cultural control. Only if they are willing to accept external initiated norms, can cultural control take effect in the organization. So a key task in staffing within personnel control is to ensure the adaptability of the recruitees to the organization. Personnel control also carries a secondary effect, when analyzed in the light of social control theory: by giving feedback about past behavior or conducting job trainings, companies typically transmit norms and values as well. Besides the explicit knowledge

transmitted in trainings or discussions, implicit knowledge, such as the organizational values or basic principles of cooperation, are also introduced and discussed with the employees.[485]

SME related liabilities. The low level of resources is not expected to be a disadvantage for the application of personnel control. As management resources are scarce, personnel control is expected to be beneficial, especially in SMEs. It ensures behavior conformity while requiring only limited principal's control costs of implementation and monitoring. Therefore, the beneficial effects of personnel control are not assumed to be reduced by the liabilities of SMEs.

To sum up, from a conceptual perspective, personnel control is expected to have a positive effect on the organizational performance.

4.1.3.2 Personnel control in large organizations

The empirical relevance of personnel control has already gained significant interest among scholars. The Academy of Management Journal (AoMJ) even devoted a full issue to the analysis of the composition and organizational outcomes of personnel control.[486]

Several researchers previously investigated the relationship between HR practices and organizational performance.[487] BECKER/GERHART, in their 1996 AoMJ review on the impact of human resource management on organizational performance, state that previous results suggest a link between HR systems and performance. While reviewing theoretical and empirical evidence, they state that "choice of HR system can have an economically significant effect on firm performance."[488]

In fact, the implementation is not only beneficial for the organization structure; its effect can have a significant economic impact. While reviewing the HR practices in large organizations, HUSELID (1995) found that a considerable increase in system sophistication results in an increased market value of >18.000 USD per employee.[489] Building on financial databases

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485 This can, in turn, also be understood as a form of communication.

486 Refer further to the AoMJ issue number 4 of the year 1996.

487 Cf. for example Delaney/Huselid (1996); Delery/Doty (1996); Huselid (1995); Olson/Schwab (1997); Pfeffer (1995); Yeung/Berman (1997); however, "this body of research is relatively small, and most of the key questions are sorely in need of further attention," Becker/Gerhart (1996), p. 779.

488 Becker/Gerhart (1996), pp. 796-797.

489 Huselid (1995) investigates the impact of an increase of one standard deviation in high performance work practices and its impact on the overall company valuation. For further details refer to Huselid (1995), pp. 667-668.

complemented by a survey, he found evidence for both an effect on short and long-term measures of corporate performance.[490]

In their 1996 study on the effects of HR systems on operational performance in 97 manufacturing plants, YOUNDT ET AL. found that an "HR system focused on human capital enhancement was directly related to multiple dimensions of operational performance (i.e. employee productivity, machine efficiency, and customer alignment)."[491] Cross-cultural research shows that the performance effect of an HR system is consistent across different national cultures. LE CHIEN/TRUONG (2005) in their study of 137 Vietnamese enterprises found that both training and development activities had a significant effect on market and organizational performance as well.[492] Besides the full HRM system, individual HRM functions such as training was also found to be beneficial for a large organization.[493]

4.1.3.3 Personnel control in SMEs

Yet, there are only very few studies that identify HRM practices in SMEs and even less studies that seek to relate HRM to organizational performance.[494]

ASTRACHAN/KOLENKO (1994), while surveying 600 family-owned businesses, found a positive association between gross revenues and HRM practices in family-owned businesses.[495] Consistent with that finding, LEON-GUERRERO ET AL. (1998) found a positive correlation between the usage of formal HRM practices such as formal employee reviews, written job descriptions, incentive compensation plans and revenues.[496] Just recently, CARLSON ET AL. (2004) found that training/development, recruitment package, the use of performance appraisals and competitive compensation are of superior importance for the organizational performance of family-owned SMEs.[497] With regard to the HRM intensity in SMEs, SELS ET AL. (2006) found a positive linear effect of HRM intensity on small business productivity.[498]

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490 Cf. Huselid (1995), p. 667.
491 Youndt et al. (1996), p. 836; Youndt et al. define an HR system as a combination of staffing, training, performance appraisals and compensation techniques. The first two directly link to this study's construct of personnel control, while the compensation technique reflects on this study's construct of results control. Refer also to p. 849.
492 Cf. Le Chien/Truong (2005), pp. 1841-1842.
493 Cf. Delaney/Huselid (1996), pp. 965-966.
494 Cf. Heneman et al. (2000), p. 21.
495 Cf. Astrachan/Kolenko (1994), p. 255.
496 Cf. Leon-Guerrero et al. (1998), p. 116.
497 Cf. Carlson et al. (2006), pp. 537-540.
498 Cf. Sels et al. (2006), p. 94.

Despite recent findings of scholars to the contrary, if HRM practices from large firms are applicable to small firms at all,[499] this study assumes a positive effect of personnel control on organizational performance in SMEs. To support this claim, the thesis builds on both agency and social control theory. In addition, prior empirical studies on human resource systems in small and large organizations suggest the positive relationship:

> *H1c) Personnel control usage intensity is positively related to the company performance of SMEs.*

4.1.4 Cultural Control

4.1.4.1 Theoretical considerations

By developing, maintaining and enforcing norms and values in organizations, cultural control communicates a desired level of morale and standards.[500] In the framework of the agency theory this technique is linked to the problems of moral hazard and its unobservability of agent actions ex-post. By setting a desired norm or implicitly communicating a desired organizational behavior, the agent receives a guideline on how to behave or which goals to pursue. In addition, social control theory suggests the existence of group mechanisms and individual socialization processes that alter organizational behaviors as well. Cultural control, thus, addresses three issues of the underlying theories: first, by setting morale and value standards for the organization (e.g. by communication or acting as a role model) and establishing an emotional bond between the employees, it addresses the *moral-hazard* problem; second, increased emotional bonds with the employees are valuable to reduce the risk of *hold-up*, when the agent is emotionally attached to the organization, the impact of hold-up then being expected to be significantly lower; finally, employees with diverging norms and values *adapt their normative system* according to the desired standards when confronted with a stable and settled corporate culture. As cultural control can be attributed to three alternative solution mechanisms, the application of cultural control is also expected to influence the individual's behavior. The increased focus and resource allocation is then expected to influence company performance in a positive manner.

SME related liabilities. The working environment in SMEs is expected to be significantly influenced by the owner/manager as he carries a dominant role in these organizations. On the other hand, small organizations are known to have a strong cohesion between the individual employees. Within such an SME that significantly builds on social relationships and that is influenced by a strong leader, cultural control is expected to be of special relevance.

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[499] Cf. Chandler/McEvoy (2000), p. 52; Deshpande/Golhar (1994), pp. 54-55.
[500] Cf. Pelham/Wilson (1996), pp. 29-30.

4.1.4.2 Cultural control in large organizations

Research on organizational cultures was conducted many times in the past.[501] However, the notion of corporate culture as a means to control behavior and as the linkage to organizational performance is rather underrepresented.

MARCOULIDES/HECK (1993) test the effect of organizational culture on performance.[502] Utilizing 392 respondents from 23 organizations and the methodology of structural equation modeling, the research team was able to show that organizational culture, represented by three key dimensions,[503] in fact affects performance. The researchers found evidence for the effect of the worker's attitude (how he internalized the proposed norms and values[504]) directly on the organizational performance. In addition they were able to show that the organizational values and climate have an impact on the worker attitude as well.[505] In essence, these findings support the notion of cultural control significantly: if an organization is able to design and alter organizational values, they are then actually adopted by the worker and affect company performance.[506] Finally, by stating that "managers might attempt to reshape the normative structure of poorly-performing organizations, as well as changing task organization processes to improve both climate and performance,"[507] MARCOULIDES/HECK describe the fundamental effect of the mechanisms of cultural control.[508]

Similarly, the satisfaction with mission statements[509] as the formal manifestation of norms, values and purposes of the organization, was found to be associated with an increased organizational performance as well.[510] BART/BAETZ (1998) assume that once a mission statement is accepted and incorporated into the organization it will in fact have an impact on performance.[511]

In their review article DETERT/SCHROEDER/MAURIEL (2000) also point out the fact that issues of control or coordination are typically associated with aspects of organizational culture and

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501 Denison (1990); Gotwon/Ditomaso (1992); Soerensen (2002).
502 Marcoulides/Heck (1993), p. 209.
503 They find a culture to consist of a "*sociocultural system* of the perceived functioning of the organization's strategies and practices, and *organizational value system*, and the *collective beliefs* of the individuals working within the organization." Marcoulides/Heck (1993), p. 209.
504 Cf. Marcoulides/Heck (1993), p. 221.
505 This effect from organizational values over worker attitude to organizational performance is then considered an indirect effect. Marcoulides/Heck (1993), p. 222.
506 Cf. Marcoulides/Heck (1993), p. 219.
507 Marcoulides/Heck (1993), p. 222.
508 See also Chapter 2.2.2.3 for the definition of cultural control.
509 Mission statements are an integral part of cultural control as they represent the implicit norms and values of an organization. Cf. Chapter 2.2.2.3.
510 Chenhall et al. (2008) found that an MCS in fact has an effect on the social capital in organizations and increases the social bonding between members of the organization (pp. 40-41).
511 Cf. Bart/Baetz (1998), pp. 842-843.

hence are inseparable from the term culture.[512] OGBANNA/HARRIS (2000) in the same manner, while researching established organizations, found that the performance of a firm is significantly influenced by the type of culture (e.g. bureaucratic or innovative culture) and the style of leadership. An externally oriented culture like competitive or innovative culture was found to significantly influence corporate performance, while more internally oriented culture like bureaucratic and community culture are not directly linked to performance.[513]

Corporate culture in fact interacts with management practices: XENIKOU/SIMOSI (2006) found a significant relationship of two cultural orientations (achievement and adaptive orientation) to business unit performance. In their structural model, cultural orientation even mediated the effect of transformational leadership on company performance.[514]

In general, various researchers previously found a significant relationship between organizational culture and performance.

4.1.4.3 Cultural control in SMEs

As already outlined in Chapter 1.2, indirect forms of control and, particularly, cultural control in SMEs, have been underrepresented in previous research. Prior studies of management control in SMEs focused rather on established and well-known direct control forms such as the Balanced Scorecard (BSC).

However, a significant body of research had aimed at understanding the consequences of a market orientation. KESSELL (2007), in his work on market oriented corporate culture, finds a significant positive effect of market orientation as a corporate culture on the performance of a young firm.[515] He argues that market oriented values and norms translate in an adjusted employee behavior that is actively seeking for insights from their customer base and incorporates this into his operational work. Various other researchers were able to replicate this effect of market oriented culture on company performance while for example, investigating antecedents, impact of national culture on the relationships, or moderating environmental factors.[516]

CHANDLER/MCEVOY (2000), in their paper on the effects of HRM systems and total quality management (TQM) orientation, found that another aspect of cultural, group based incentives has a significant effect on company performance. Using a survey of 66 SME manufacturing

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512 Cf. Detert et al. (2000), p. 857.
513 Ogbonna/Harris (2000), p. 781.
514 Cf. Xenikou/Simosi (2006), pp. 574-577.
515 Cf. Kessell (2007), p. 218; Brettel et al. (2008a), pp. 1207-1208.
516 Cf. for example Claas (2006); Engelen (2008).

firms, they found that a TQM strategy was most effective when complemented with relevant training (personnel control) and group incentives (cultural control).[517]

COLLIER (2005), while describing the overall MCS of a young organization, emphasizes entrepreneurial control, as on of the success factors of an Australian based multinational packaging company (TNA). He finds that "crucial to the control of TNA, however, is the role of the entrepreneur through the social control he exercises over employees."[518] While using a spreadsheet model for formal sales and marketing control, the owner heavily employs social control to ensure goal-oriented behavior of his employees. Typically, he "spends his evenings with his employees while traveling."[519] This interaction allows him to stay connected to his widely distributed employees, but also to serves as a mean of control: "Social control prevented any challenge to the authority of Taylor [owner-manager, J.H.], and legitimized his power."[520] The entrepreneur describes the benefit of cultural control for his venture as the ability for fast adoption: "because of the high level of communication in TNA we have been very adept at anticipating downturns and upturns. I have trouble seeing how any financial system could predict trends in the market. I think people do this much better."[521]

Building on empirical results of previous studies on corporate culture and cultural control, this study hypothesizes a positive effect of cultural control and company performance.

H1d) Cultural control usage is positively related to the company performance of SMEs.

4.2 Control combinations

As shown in 4.1, this study assumes that there is a discernible effect of the four individual management control forms on company performance. However, as controls are used simultaneously,[522] this study also aims at enhancing the knowledge on control combinations.

4.2.1 Theoretical considerations

Control combinations are perceived rather as more "collaborative than command-and-control forms of management."[523] Control combinations can be conceptually understood from the two perspectives of agency and social control theory.

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517 Cf. Chandler/McEvoy (2000), p. 43.
518 Collier (2005), p. 321.
519 Collier (2005), p. 331.
520 Collier (2005), p. 334.
521 Collier (2005), p. 332.
522 Cf. Simons (1994), p. 5.
523 Cf. Cravens et al. (2004a), p. 214.

Agency theory. In the theoretical model of agency theory, three fundamental issues are presented that are caused by the relationship between a principal and the agent. Moral hazard, adverse selection and hold-up are considered as three separate issues that management control thrives to reduce. Addressing each separate issue with a control form was shown to be beneficial in the previous chapter.[524] To determine if high control combinations are in fact associated with the highest performance, this study uses the two dimensions of control costs and benefits from agency theory to develop an understanding of the effects.[525]

- For the *principal*, the key benefit of a high control combination is the increased performance feedback using different controls. He is then able to build his decisions on increased information and recognizes a potential target misachievement earlier.[526] Although implementing a larger number of controls, the manager is expected to use the most efficient alternative with the most favorable outcomes, which facilitates mitigating the disadvantages of all four control forms. This increased efficiency in decision making and control execution is expected to outbalance the additional control costs resulting from the application of the high control combinations.
- The *agent* is expected to be able to reduce his individual signaling costs as the principal receives feedbacks from different forms of control. Once a principal retrieved performance information using one control form, there is no need to receive this information from an alternative control form again. By doing so, the signaling costs of the agent are not expected to increase linearly with the introduction of more controls. The second positive effect of the high control combination is the increased feedback on desired actions to the agent. As this information is transmitted by using four controls simultaneously, the employee receives a rather holistic view on his organizational targets. This increased feedback and information has previously been shown to raise motivation and is also expected to increase the overall performance.[527]

Social control theory. Behavioral effects of this theory build on the mechanisms of socialization. Social controls complement direct controls, but are not expected to replace them. HOPWOOD (1976) elaborates that control is in fact "not only achieved by formal means but also by pressures exerted by individuals over another."[528] As social control theory was developed to extend the view of traditional controls, its purpose was to complement the other

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524 Refer to Chapter 4.1 for the development of hypotheses on the direct effects.

525 The basic assumption of the approach is that both control costs and benefits add up, but do not decrease in their effectiveness. Agency theory does not establish or explain any interaction effects between the measures to solve agency issues. Hence, this study assumes that the corresponding management control forms add up in their effectiveness as well.

526 The approach of increasing information from control can also be related to the strategy of increasing the control potential (in contrast to decreasing the control requirements.) Cf. Schäffer (2001), pp. 126-141.

527 Cf. Cravens et al. (2004a), p. 214.

528 Hopwood (1976), p. 27.

forms and not to replace them. Especially the application of the controls in conjunction is expected to be beneficial, as the use of social control sustains the application of administrative controls.[529] HOPWOOD suggests an example of two managers using identical direct controls. Their performances vary with respect to the application of their social controls and skills.[530] Hence, from the perspective of social control theory, a strong application of the combination of both direct and indirect controls is expected to be most beneficial for an organization.

Despite the assumed positive effects on the principal-agent relationships, control combinations are considered by the agents as being too restrictive.[531] An explicit combination of different controls could be intriguing to employees. However, this study takes an alternative perspective: as the principal is able to deploy different control forms simultaneously, he is also able to use different controls in appropriate situations. In case he uses all four available control forms he can systematically choose the appropriate control form from his control forms portfolio. In addition, personnel and cultural control are only visible to a small extent and rather provide the feeling of increased autonomy.[532] Hence a high control combination is not expected to be visible to a great extent in an organization.

Besides the theoretical considerations discussed above, direct and indirect controls are also expected to interact with another, rather practical, perspective: personnel control, with its elements of feedback and training are expected to support direct controls. Once having received training or feedback sessions, an employee understands the requirements for and the processes of direct control, which are then expected to increase the effectiveness of direct controls. Hence, the application of direct controls is expected to profit from executing personnel control. Cultural control was also previously shown to influence employee behavior. Consequently, once a manager implements cultural control, he is able to reduce his efforts put into direct controls. CRAVENS ET AL. (2004) argue in a similar vein when stating that "[h]igh levels of informal (professional and cultural) control are expected to reinforce high levels of formal control."[533]

In essence, both the theoretical frameworks and the practical considerations suggest the positive effect of high control combinations on the organizational performance.

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529 Cf. O'Reilly (1989), p. 12.
530 Cf. Hopwood (1976), p. 27.
531 According to feedback from SME owners/managers during the initial interviews. Contrary to this, Jaworski et al. (1993) found that high control combinations were associated with the highest job satisfaction in comparison to other combinations. (p. 66).
532 O'Reilly (1989), p. 12.
533 Cravens et al. (2004a), p. 242.

4.2.2 Control combinations in large organizations

Three researchers had investigated the effects of control combinations and provided evidence on which this study has been built. Previous research on control combinations reveals a mixed picture of the consequences: while investigating the control approach of general managers on new vs. established products, BART (1993) found that managers typically used a set of loose formal controls as well as tight informal controls (clan control in the terminology of the study's control combinations framework).[534] He argues that the informal controls were used to balance formal controls, although formal controls are considered helpful for the task.[535] However, BART does not suggest the use of one particular control combination, as one of his key findings is that the most beneficial control configuration is highly contingent on the type of the new product and its desired product output frequency.[536]

In contrast to the findings of BART (1993), JAWORSKI ET AL. (1993) and CRAVENS ET AL. (2004) found that a high control combination is associated with various dimensions of beneficial employee behaviors and performance consequences. JAWORSKI ET AL. presented a study that investigates the consequences of control combinations in the functional area of marketing. Using a survey of 379 marketing executives, the researchers illustrate that high control systems are associated with the highest levels of employee satisfaction and low levels of person-role conflicts and ambiguity.[537] At the same time, the study was not able to determine any positive effect of management controls on job performance.[538] However, they argue that a high control system should be preferably be implemented and if formal controls are necessary for target achievement, they should be complemented with informal controls to "ensure high morale and group cohesiveness."[539]

In line with the findings of JAWORSKI ET AL. (1993), CRAVENS ET AL. (2004) too found that the combination of high levels of direct and indirect controls (high control combination) was associated with beneficial consequences.[540] Building on a sample of 1042 salespeople across various industries and sectors, they found that high control combinations were related to increased job performance, higher levels of job satisfaction, and both lower burnout and role stress. Contrasting JAWORSKI's findings, CRAVENS ET AL. (2004) were in fact able to show

534 Cf. Bart (1993), p. 342.
535 Cf. Bart (1993), p. 359.
536 Cf. Bart (1993), pp. 357-358.
537 Interestingly, Jaworski et al. (1993) did not develop the hypotheses using theoretical considerations, as they state "[g]iven the novelty of the control combination concept, we acknowledge that these hypotheses are speculative" (p. 60); Cravens et al. (2004a), come out with a similar view (p. 242).
538 Cf. Jaworski et al. (1993), p. 67.
539 Jaworski et al. (1993), p. 67.
540 Cf. Cravens et al. (2004a), p. 246.

that high control combinations had a positive effect on individuals' sales performance as well.[541]

BART's findings are not considered further in this study as they cover the field of new product launch and the findings are of a rather technical nature. Hence its transferability to the problem of execution or plan implementation is rather limited.

This study, on the other hand, assumes that the findings of previous studies on management control combinations in sales and marketing departments can be used as a foundation for this study. Both sales executives and top-managers are assumed to share a distinct set of characteristics. First, both share a certain area of responsibility. The manager is responsible for his department, while the sales force employee is responsible to achieve sales in his market area. Second, both share a high desire for significant amounts of information. Sales force employees are motivated by them,[542] while managers consider them relevant for the interaction with other departments.[543] Finally, both share a strong desire for autonomy in their work. Although behavioral controls seem to be necessary, both are motivated to achieve their goals without an excessive amount of interaction with their direct manager. Due to these three similarities this study assumes a significant amount of similarity between both employee groups to be present and thus uses the previous results of control combinations to derive the hypothesis:

> *H2) A high control combination is associated with superior performance in comparison to all other control combinations in SMEs.*

4.3 Moderating effects on management control forms

As outlined in Chapter 2.2.4, the performance effects are expected to be influenced by certain moderating factors during the life cycle of an SME. Moderating effects are reviewed from a theoretical perspective and contrasted with previous empirical findings. However, as empirical results for the control-performance relationship are sparse, the findings on related results of learning processes are integrated where useful.

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541 Cf. Cravens et al. (2004a), pp. 246-247.
542 Cf. Cravens et al. (2004a), p. 242.
543 Or even learn from the outcomes, cf. Schäffer (2001), pp. 27-43.

4.3.1 Age

4.3.1.1 Theoretical considerations

Company age is associated with organizational learning.[544] With increasing age, managers and employees are able to assess different approaches, processes, configurations or settings of control.[545] Initially, organizations carry out a trial-and-error process, but ultimately select the process that fits the organization best. Accumulated knowledge of the organization is expected to increase the quality of managerial decision making. This finding is independent of organizational growth in size: even if an organization does not grow in size, learning about management practices also translates into an increased knowledge and increased efficiency.[546] Developing knowledge requires experience and rounds of trial and error before the appropriate routines are selected.

Taking the perspective of agency theory, this study assumes that learning reduces management control costs, as organizations learn about the most effective control forms and how to execute them efficiently. Managers thus need less preparation for meetings, reviews or processes as they are already able to identify the best practices to fit their requirements. Agents at the same time are accustomed to controls and the processes associated with them. They learn from previous control activities, anticipate new controls and respond more efficiently to the use of controls. In essence, age is considered to be beneficial for all control forms.[547]

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544 Cf. Davila (2005), p. 227.

545 Despite its positive effect, Davila (2005) argues that the impact of age is potentially of a non-linear nature: "[a]ge may not have a linear relationship with the emergence of MCS (Luft/Shields (2003)). While age may initially be associated with learning, as firms become older they may also become set in their operating ways and unable to change (p. 227)." Although accepting the potential impact of age on MCS adoption profiles, this study considers this effect not to be present in its particular empirical analysis: control is expected to increase its quality with growing age. Only because an organization gets older, it does not imply that the quality or outcomes of management control decrease. Hence an effect of control effectiveness is not assumed.

546 Cf. Davila (2005), p. 227.

547 In particular, all four controls benefit from an increasing organizational age. Results control profits as both parties learn how to conduct review meetings and design relevant incentive schemes. Behavior control efficiency increases as well as principal gain task knowledge and both are able to direct the underlying behaviors more efficiently. In a similar fashion, personnel control profits from control cost reduction as recruiting processes, required employees' skill-sets and retention approaches continuously improve along the timeline and get refined. Cultural control is influenced by the age of the organization: with increasing age, norms and values become more settled and stable and managers increasingly learn which techniques (e.g. role models vs. group incentives) operate best given the prevalent corporate culture. To sum up, managers are expected to behave in a more efficient manner and apply only beneficial control techniques; at the same time, agents are expected to learn from previous control experiences and decrease their signaling costs by review preparation or preemptive goal-oriented behaviors.

4.3.1.2 Empirical findings

Previous research work on the impact of age on MCSs focused on the composition and adoption effects in organizations. DAVILA/FOSTER (2005) found that low age is associated with a dominance of rather informal control systems, while an increasing age leads to rather formalized and mechanistic MCS.[548] In particular, age was found to be of particular importance as it is "relevant through its impact on the variation, selection, and retention processes where the experimentation and learning of an organization is codified over time into formal management systems."[549] This particular understanding of a change in the MCS composition with increasing age is present in numerous other research papers investigating MCS in SMEs. Researchers were able to demonstrate that the composition of an MCS in fact changes with the age and growth of an organization.[550]

However, no research has yet been conducted on the effect of age on the performance effect of an SME. Despite the difference in configuration, one might assume that the effect of control intensity on performance can also change with increasing age. To address this issue, this study concentrates on literature on organizational learning and its impact on management. Organizational learning was identified as a key success factor. LEVINTHAL/MARCH (1993), for example, state that "[m]any have come to view the ability to learn as an important, indeed in some accounts unique, source of sustainable competitive advantage."[551] Previous research found that organizational learning in fact has an impact on the execution of certain management techniques: researchers revealed that the performance effect of leadership proficiency and skills is in fact positively moderated by the age of the organization; the older the organization gets, the stronger the impact of leadership skills on performance.[552]

Although studies considered age as an important factor in the adoption of MCS in SMEs, findings on the moderating impact of age on the control-performance relationship are still lacking. This study assumes that an increasing age supports management control by providing learning experiences; it thus concludes that company age has a positive impact on management controls and states:

> *H3) The usage intensity of the four management control forms is associated with a stronger effect on performance in older SMEs in comparison to younger SMEs.*

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548 Cf. Davila (2005), p. 243.
549 Cf. Davila (2005), p. 243.
550 Cf. Boag (1987); Amat et al. (1994); Romano/Ratnatunga (1994); Perren/Grant (2000); Greenhalgh (2000); Moores/Yuen (2001); Wijewardena/De Zoysa (2001); Wijewardena et al. (2004); Cardinal et al. (2004); Granlund/Taipaleenmaki (2005); Collier (2005); Davila/Foster (2005); Davila (2005); Davila/Foster (2007); Sandino (2007); Berthelot/Morrill (2007).
551 Cf. Levinthal/March (1993), p. 103.
552 Cf. Woiceshyn/Hartel (1996); Hayton (2003); Spicer/Sadler-Smith (2006).

4.3.2 Size

4.3.2.1 Theoretical considerations

As outlined in Chapter 2.3, SMEs are facing the liability of smallness. In comparison to large organizations, they suffer from their low endowment of resources.[553] At the same time, growing organizations are faced with increasing communication complexity. The number of required communication paths between employees exhibits a quadratic growth pattern with an increasing number of employees.[554] Consequently, internal processes are also affected by this situation and have to be adjusted accordingly.[555]

Size is expected to have a negative impact on *direct controls*: with every additional employee, control costs (preparation and conducting control) are expected to increase; hence their efficiency is expected to decrease.[556] Due to the traditionally low hierarchies in SMEs, a growth in the number of employees is not expected to correlate with the growth in management resources. Hence, increasing size distributes the managerial resources even further and is, therefore, expected to decrease management control quality and, thereby, the performance.

In contrast, *indirect controls* are assumed to be positively impacted by company size. The principal's costs of indirect control per employee decrease with growing size, as defining recruiting profiles or development paths are primarily associated with an initial set-up effort.[557] Once a manager has decided how to communicate relevant norms and values in the organization, the marginal cost of communicating them comes down. In the same way, personnel control activities share a common base (e.g. required employee skills or training schedules) as well. Once this initial set-up of HRM techniques is developed, the initial costs and ongoing control costs can be distributed across an increasing number of employees which results in an overall control cost reduction per employee. Hence, indirect control forms are expected to be more efficient for larger organizations.

4.3.2.2 Empirical findings

Few studies considered size as a contextual variable, even less as a moderator of the performance effect of controls. In essence, several studies provide evidence for an effect of

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553 Cf. Welsh/White (1981), p. 18 and 32; Storey (1985), p. 329. Refer also to Chapter 2.3 for further discussion.

554 Number of required communication paths between employees ($N_{ComPaths}$) is calculated using the number of employees (n): $N_{ComPaths}=n * (n-1)/2$. Cf. Davila (2005), p. 226.

555 For example previous informal working relationships do not continue to be efficient and have to be formalized. Cf. Chenhall (2003), p. 148.

556 Cf. Davila (2005), p. 227.

557 Snell (1992), p. 320.

organizational size on the extent of MCSs implemented in the organization.[558] In addition, size was found to be one of the key drivers for the adoption of various management accounting practices.[559] Personnel and cultural controls are also affected positively by company size. SNELL, in his 1992 study on HRM systems, states that "as firm size increases, executives make greater use of input controls."[560] In line with these findings, DAVILA/FOSTER (2007) reveal that the adoption intensity of 46 (predominantly direct but indirect control forms as well) different MCS tools is associated with increasing company size.[561]

Researchers investigated the impact of company size on the performance effect of control only to a minor extent. In their review on participative budgeting and their performance impacts, SHIELDS/SHIELDS (1998) found that only one out of 47 studies actually considered organizational size as a moderator.[562] MERCHANT (1981) came to the conclusion that size is in fact positively interacting with the performance effect of budgeting.[563] Even the extensive literature review of LUFT/SHIELDS (2003) on 275 papers on management accounting practices presented only the research of MERCHANT (1981) in relation to the impact or organizational size on the performance effect of controls.[564]

Again, the majority of previous studies on SMEs focused on the adoption and usage patterns with growing organizational size. However, building on the theoretical considerations and preliminary empirical evidence, this study assumes that size has only a negative effect on direct controls and a positive effect on indirect forms of control. This leads to the formulation of the following hypotheses:

> *H4a) Results control usage intensity has a lower effect on performance in larger SMEs in comparison to smaller SMEs.*
> *H4b) Behavior control usage intensity has a lower effect on performance in larger SMEs in comparison to smaller SMEs.*

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558 Cf. Wager (1998); de Kok/Uhlaner (2001); Davila (2005).

559 Here, for example, the adoption processes of activity based costing: Cf. Drury/Tayles (1994); Innes/Mitchell (1995); Bjørnenak (1997).

560 Snell (1992), p. 320.

561 Cf. Davila/Foster (2007), p. 918.

562 Cf. Shields/Shields (1998), p. 74. The study actually presents Merchant (1984) as a second study that supposedly uses organizational size as a moderator. Merchant (1984) provides evidence for an effect of size on formality of controls, but does not formally include organizational size as a moderator of a performance effect; it is rather included as an element in the fit-relationship and its performance effect.

563 Cf. Merchant (1981), pp. 826-827. In addition, Merchant (1984) found that fit relationship of controls deployed in alignment with organizational characteristics (formal control usage in larger organizations) is associated with a higher organizational performance (p. 302).

564 Cf. Luft/Shields (2003), p. 212.

H4c) Personnel control usage intensity has a stronger effect on performance in larger SMEs in comparison to smaller SMEs.
H4d) Cultural control usage intensity has a stronger effect on performance in larger SMEs in comparison to smaller SMEs.

4.3.3 Life cycle stage

As outlined in Chapter 2.2.4, the corporate life cycle significantly influences organizational characteristics.[565] Typically, the management faces certain challenges during the course of the corporate life cycle that have to be addressed in order to achieve growth and enter the next development stage.

4.3.3.1 Theoretical considerations

In relation to management activities and management accounting practices, early phases of venture development are associated with more different characteristics than later development steps. Early development phases in SMEs and especially in innovative SMEs are characterized by more focus on R&D activities and less on accounting or sales and marketing activities. Thus, dedicated management and personnel resource to the topic of management control are rather scarce. During later life cycle stages, management focus switches from product development to sales and marketing activities in order to generate initial revenues and strengthen customer relations. Simultaneously, the management style required transfers the focus from a rather creative manager personality to a management characterized by delegation and coordination.[566]

This shift of management styles is also expected to be associated with learning. By transferring from one to the next lifecycle stage, managers overcome crises and learn from failures and successes. This learning process is assumed to be applicable to management control as well. The effects of learning on the agency costs of management control are identical to the considerations illustrated in Chapter 4.3.1.

4.3.3.2 Empirical findings

Previous empirical findings suggest an effect of the corporate life cycle on the design of MCSs; however, only one investigated its effect on the control-performance relationship.

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[565] Granlund/Taipaleenmaki (2005) also state that corporate life cycle models are superior in describing management accounting practices, as size or age are only static factors, but corporate life cycle models describe the actual phases of young ventures.

[566] Cf. Greiner (1972), pp. 41-45; Voll (2008), p. 61.

In one of the first studies on MCS in SMEs, ROMANO/RATNATUNGA (1994) illustrate that the implementation of a formal planning and control system is an important part in the evolution of a firm and is contingent on a number of variables.[567] Using 18 case studies of SMEs, the research team found that formal planning and control systems are especially important for organizations operating at stages of mature growth. Companies which did not implement the systems, however, showed a significant lower overall growth rate.[568] In a similar fashion, MOORES/YUEN (2001) show that high growth firms in the apparel and footwear industry typically increase the level of formality of their management accounting system along the corporate life cycle. Very importantly, the stage of company growth[569] dominates other stages in creating the need for a formal management accounting.[570] GRANLUND/TAIPALEENMÄKI (2005) partially support this finding, while investigating the MCS in eight new economy firms (NEF). While also showing an increasing level of formalization during the NEF life cycle, they were able to show that MCS in NEF also bear significant, different characteristics in comparison with established industries:[571] NEFs, driven by a desire to meet the expectations of external parties like VCs or other stakeholders, emphasize short-term planning activities rather than over controls. MCS in the early stages are implemented very selectively (focus on statuary techniques) with a strong temporal orientation (time pressure) and are typically supported by only very limited personnel resources.[572]

LIAO (2006), one of the few studies on the moderation of the HRM-performance link, found that organizational life cycle stage, in fact, moderates the relationship: she found that while behavior control had a stronger impact on performance during later stages, output control had a negative performance during the later stages of the life cycle.[573]

Despite the previous empirical research on the evolution of MCS along the corporate life cycle, the evidence on a performance impact remains sparse. Previous studies showed that later life cycle stages influence the choice of formal/direct control systems. However, this study aims at investigating its performance effect. As the shift from one life cycle stage to the next is assumed to be linked to organizational learning, this study assumes that the life cycle stage has a positive impact on management control effectiveness. Therefore, it leads to the following hypothesis:

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567 Managerial contextual variables included life cycle stage, education, previous experience, management typology, and leadership style. Cf. Romano/Ratnatunga (1994), pp. 179-188.
568 Cf. Romano/Ratnatunga (1994), pp. 190-191.
569 Second life cycle stage in the applied life cycle model (life cycle model of Miller/Friesen (1984)).
570 Cf. Moores/Yuen (2001), p. 383.
571 Cf. Granlund/Taipaleenmaki (2005), p. 42.
572 Cf. Granlund/Taipaleenmaki (2005), p. 48.
573 Cf. Liao (2006), p. 195.

H5) The usage intensity of the four management control forms is associated with a stronger effect on performance in the later phases of the life cycle in comparison to the earlier phases of SMEs.

4.3.4 Management experience

4.3.4.1 Theoretical considerations

Management experience is associated with the previous learning of managers about how to behave in the role of a manager and how to use MCS to influence employees' behavior. In case a manager has already gained experience in a similar management role, he is exposed to the problems involved both in the introduction and operational execution of management control. He is able to try different execution alternatives and pick the optimal solution for the organization. This conceptual and process knowledge is transferable and can be used in a new position as well. Initial consequence of the learning process is the earlier introduction of MCS, as the manager previously experienced the benefits of control. Simultaneously, once an MCS is installed, the manager will execute it with a very high quality due to the application of his knowledge.

In the model of agency theory, the principal is expected to profit from reduced control costs (as he can profit from previous optimization to limit his personal involvement) and improve his benefits (by designing an MCS specifically for his needs). At the same time, agents can also profit from experience, as useless requests and inconsistent controls are reduced with growing management experience. Hence, management experience is expected to decrease agent's control costs. However, the employee's individual benefits from management control (feedback and feed forward) are assumed to remain constant.

4.3.4.2 Empirical findings

The impact of previous experience on management practices was previously determined empirically in the context of general management and entrepreneurship.

Early research revealed that the quality of decision making[574] is also associated with an increased managerial experience. Once a manager completed a sizable number of years as a manager, his decisions were found to be superior.[575] However, TAYLOR (1975) points out that the decision-maker's age has an even stronger impact on decision making quality. Still,

[574] Based on different dimensions such as decision time, confidence, and flexibility: Taylor (1975), p. 78.

[575] Taylor (1975), p. 81.

managerial experience allowed the principal to come to better decisions, a key requirement for the execution of control.

STUART/ABETTI (1990) found that relevant experience is associated with the increased success of an organization. While investigating the effect of entrepreneurial experience on the success of a new venture, they determined that previous entrepreneurial experience had a significant impact, while the more general criteria of age, technical knowledge or experience as a manager had no effect on the venture's performance.[576] Applied to the problem of management control and managerial experience, the study indicates that an increased specific experience (managing of employees) is beneficial for the application of control as well. Similarly, MCGEE ET AL. (1995), while investigating the performance of young ventures, found that the orientation of cooperative strategy is moderated by previous management experience. Hence, previous management experience increased the effectiveness of cooperative behavior. Management control can also be understood as an element of cooperative behavior, as it includes interaction with the employee to ensure appropriate behavior.[577]

Only very little research has emerged on the interaction of MCS and managerial experience: researchers showed that experienced managers tend to implement more MCS and to adopt them faster.[578] Contrary to these results, in their 1994 study on small manufacturing firms, ROMANO/RATNATUNGA (1994) were not able show a significant impact of previous experience on the usage patterns of formal planning and control systems.[579]

No empirical studies, however, are currently known to describe the effect of management experience on the performance consequence of controls. Therefore, in line with the considerations of company age, a positive effect of management experience on the control-performance relationship is assumed in this study.

> *H6) The usage intensity of the four management control forms is associated with a stronger effect on performance while being executed by a more experienced manager in comparison to a less experienced manager in SMEs.*

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576 Cf. Stuart/Abetti (1990), pp. 160-161.
577 Cf. McGee et al. (1995), pp. 577-578.
578 Cf. Davila/Foster (2005), p. 243. Maes et al. (2005), pp. 29-31, found no impact of managerial experience on the performance of a young venture, but only an impact on the application of management techniques.
579 Cf. Romano/Ratnatunga (1994), p. 188.

4.4 Research model and summary of hypotheses

During the course of the previous three chapters, this study developed hypotheses on the outcomes of management controls in SMEs. Figure 11 provides an overview of the developed hypotheses which will be tested empirically in the course of the subsequent chapters.

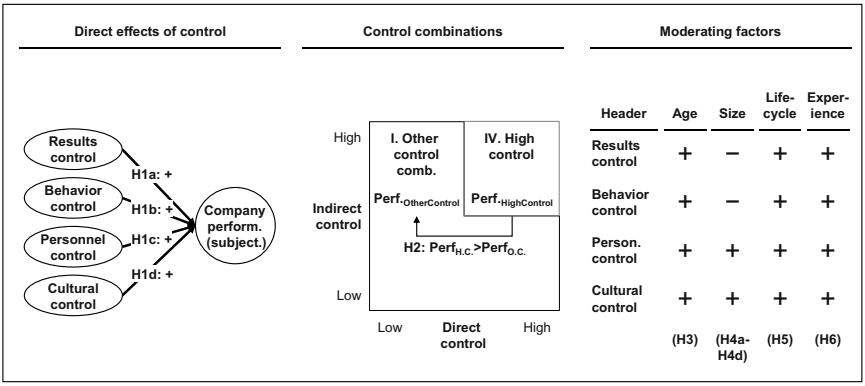

Figure 11: Summary of hypotheses[580]

[580] Own illustration.

5 Preparation of empirical analysis

This chapter summarizes the analytical methodology to test the previously developed hypotheses. Building on the research goals of this study, the potential methodologies for structural equation modeling are evaluated and the selected partial-least-square is reviewed in the course of Chapter 5.1. In addition, the measurement model is presented in Chapter 5.2.

5.1 Methodology

The appropriate research method has to be chosen according to the desired insight of a study. Exploratory methods are used to investigate existing behavior and to develop theories to describe these observations. In contrast, confirmatory methods build upon the findings of previous exploratory research and aim at rejecting or confirming predefined hypotheses. As different exploratory studies concerning the effects of management control[581] as well as studies that test the liabilities of SMEs in the past[582] exist, it seems legitimate to apply a confirmatory approach to this study. This is reinforced by EDMONDSON/MCMANUS who propose a strong methodological fit between the research approach and the existing knowledge on the investigated phenomena.[583] If a study encompasses precise theory and is being supported by previous research in varied settings, it can be seen as built on a mature theory. Then, a confirmatory approach to test developed hypotheses is suitable to extend academic knowledge.[584] The proposed requirements for a confirmatory study are met as well, as this study builds upon a large number of previously used constructs and measurements.[585]

5.1.1 Selection of analysis methodology

This section summarizes the selection process of the multivariate methodology to study the different effects of controls (Chapter 5.1.1.1) and details the concept of structural equation modeling as the chosen statistical approach (Chapter 5.1.1.2).

5.1.1.1 Multivariate statistics

Multivariate statistics are used to measure and investigate the interaction between multiple variables. The effects of a number of different management control forms on company performance are of particular interest for this study. Therefore, multivariate statistics are required to capture these interdependencies. Multivariate statistics were developed in the 1970s and

[581] See Chapter 2.2.4; the majority of previous research on management control in SMEs was conducted using exploratory research methods. For an overview on the studies refer also to Chapter 1.2.
[582] See Chapter 2.3.
[583] Cf. Edmondson/McManus (2007), p. 1060.
[584] Cf. Edmondson/McManus (2007), p. 1059.
[585] Cf. Edmondson/McManus (2007), p. 1060.

slowly replaced the use of previously used uni- and bivariate statistics. Important elements of the first generation of multivariate statistics are factor analysis, cluster analysis and multiple regressions.

Starting in the 1980s, the second generation of multivariate statistics were developed to overcome certain disadvantages of the first generation. The new generation was then able to (i) handle multiple exogenous and endogenous variables, (ii) utilize non-observable (latent) variables, (iii) incorporate measurement errors and (iv) enable confirmatory testing procedures.[586] Among the second generation statistics, structural equation models (SEMs[587]) reached superior importance in the field of business administration, as they were extensively used in the field of marketing.[588] SEMs became frequently adopted in the academic world and are currently the state of the art methodology for the analysis of complex relationships. For the publication in certain top journals such as the Journal of Marketing Research, the use of SEMs is even considered a quasi minimum requirement.[589]

As this study aims at performing confirmatory testing procedures to determine the influence of different control forms on performance of SMEs, this study chose to employ multivariate statistical methodology of the second generation. In particular structural equation modeling was chosen as the method for analysis.

5.1.1.2 Key principles of structural equation models

Structural equation modeling allows researchers to study causal relationships between multiple variables. The alternatively used term 'causal analysis' is somehow misleading: from an epistemological perspective, the phenomenon of causality cannot be proven by the use of only an SEM.[590] In order to test for causal relationships, an accompanying theory is used to define the direction of effects and the respective hypotheses, that are then tested with an SEM. Despite this inconsistency in terminology, the term causal analysis became synonymous for structural equation modeling and will be applied further in this study.

The most prominent contribution of SEM is the ability to analyze complex relationships between latent (non-observable) variables that are represented by manifest (observable) variables.[591] Latent variables are "abstract, unobservable properties or attributes of a social

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586 Cf. Chin (1998b), p. 297; Betzin/Henseler (2005), p. 20.

587 The term also refers to the activity of conducting an analysis with SEMs (structural equation modeling).

588 Cf. Homburg/Baumgartner (1995), pp. 1092-1094; Homburg/Pflesser (2000b), p. 635; Homburg/Klarmann (2006), p. 727.

589 Cf. Homburg/Baumgartner (1995), p. 162.

590 Cf. Homburg/Hildebrandt (1998), p. 17.

591 Cf. Fassott/Eggert (2005), p. 34; Homburg/Pflesser (2000b), pp. 635-636.

unit or entity,"[592] while manifest variables can be observed within the population. As management controls, especially indirect forms of control, cannot be observed or described solely by their number or their appearance, this study choose to use latent variables.

SEM provides the possibility to integrate both latent and manifest variables by specifying two models:[593] The first, the structural model, encompasses all latent variables and the interrelationships between them. The second element of an SEM is the measurement model, which connects the latent variables to the observable indicators. The core of the analysis, the interaction between the theoretical constructs, is represented in the *structural model*. It represents the direction and relationships between the variables as derived from theory. Exogenous and endogenous variables are distinguished in relation to the direction of influence in the model. Exogenous (independent) variables have an influence on and change the extent of endogenous (dependent) variables. As both exogenous and endogenous variables are non-observable, they have to be represented by observable variables. This is done separately in the *measurement model* for each latent variable. By doing so, each latent variable is represented by a set of manifest indicators which represent the latent variable.[594] Both networks of variables are also referred to as the inner (structural) and outer (measurement) model.[595] The combination of the structural model and the related measurement models is called the structural equation model. It defines the overall relationships between theoretical constructs and the required manifest indicators to measure them. An overview of a typical structural equation model is visualized in Figure 12.

[592] Bagozzi/Phillips (1982), p. 465.
[593] Cf. Ringle (2004), p. 5; Götz/Liehr-Gobbers (2004a), p. 716; Betzin/Henseler (2005), p. 50; Zinnbauer/Eberl (2005), p. 567.
[594] Cf. Diamatopoulos (1994), p. 108.
[595] Cf. Götz/Liehr-Gobbers (2004a), p. 716.

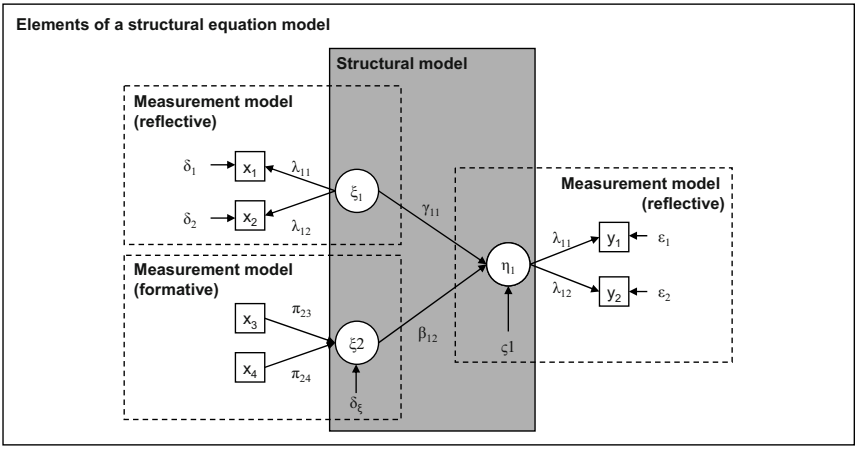

Figure 12: Composition of structural equation models[596]

The figure summarizes a simple structural equation model with three latent variables.[597] The exogenous variables ξ_1 and ξ_2 influence the endogenous variable η. The strength of the effect of the exogenous variables on the endogenous variable η is represented by the path coefficients γ and β. As it is not possible to predict the value of the endogenous variable by using the two exogenous without any error, an error term ζ is included in the equation. The measurement models define the relationship between the latent variables ξ_1, ξ_2 and η and their respective manifest indicators x_1, x_2, x_3, x_4, y_1 and y_2. Each pair of manifest indicators reflects one theoretical construct in this model. Depending on the operationalization of the constructs, the theory distinguishes a reflective and a formative measurement models.

The indicators in *reflective measurement model* can be understood as consequences or results from the latent variable. This relation is visualized with an arrow from the construct to the related indicators in the measurement model of the latent variable ξ_1. The measurement of ξ_1 with the two indicators is associated with a measurement error.[598] The error is related to each of the two indicators and is denominated δ_1 and δ_2. The strength of the relationship between the indicator and the latent variable is represented by the so called loadings λ_1 and λ_2.

In a *formative measurement model*, the construct is represented by a combination of complementary indicators. In the case of the formative construct ξ_2 the two indicators x_3 and x_4 cause the construct, which is reflected in the direction of arrows from the two indicators to

596 Cf. own illustration building on Götz/Liehr-Gobbers (2004a), p. 716.
597 For further overview, refer also to Götz/Liehr-Gobbers (2004a), p. 718.
598 Cf. Gerbing/Anderson (1984) offer an extensive overview on measurement errors on the indicator level starting p. 576.

the construct. The strength of the effect indicators to the construct is represented by the weights π_{23} π_{24}. These weights can also be interpreted as coefficients of a multiple regression. Again, as the measurement of a formative measurement model is also associated with an error term, it is denominated as δ_{ξ}.

5.1.2 Choice for variance based analysis with PLS

Structural equation models can be solved using two different solving approaches. Covariance-based algorithms minimize the difference between the covariance matrices based on empirical data and the one based on theoretical parameters.[599] Hence they aim at optimizing the covariance matrix of the model in a way that it matches the covariance matrix of the empirical data best by using a maximum-likelihood estimation algorithm.[600] Up until recently, researchers nearly exclusively used covariance-based SEMs. This fact can also be attributed to the availability of sophisticated and user-friendly software systems like LISREL or AMOS.[601] Already in the 1970s, JÖRESKOG/SÖRBOM, two of the key contributors, had developed the software package LISREL that gained significant importance in the field of management research. Currently, the software has reached its eighth release version and is still considered state-of-the-art research method in various areas of research.[602]

The variance-based approach, in contrast, aims at maximizing the amount of explained variance of the dependent variable.[603] It builds on the estimation algorithm of partial-least squares which was initially developed by WOLD and was further refined by CHIN.[604] Various software packages are available to support the analysis of variance-based structural equation models (PLS-Graph, smartPLS, VisualPLS).[605] Besides the previously well-published PLS-Graph package by CHIN,[606] the software suite smartPLS, developed by a research team at the University of Hamburg, is gaining increasing attention and acceptance in top journals.[607]

Besides the algorithm logic itself, both approaches can be distinguished by certain characteristics that recommend the usage of either one of them. Four criteria are typically discussed to determine the choice of one method four analysis: (i) suitability of research goals

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599 Cf. Haenlein/Kaplan (2004), p. 290.
600 Cf. Diamatopoulos (1994), p. 112.
601 Cf. Chin (1998b), p. 297.
602 Cf. Homburg/Hildebrandt (1998), p. 19; Fassott/Eggert (2005), p. 20.
603 Cf. Fornell/Bookstein (1982), p. 443.
604 Herman Wold previously deployed the denomination NIPALS or. NILES (nonlinear iterative [partial] least squares). Cf. Wold (1966), p. 399; Wold (1982), p. 327; Chin (1998b), p. 297.
605 Cf. Voll (2008), p. 90.
606 Cf. Götz/Liehr-Gobbers (2004a), p. 714; Homburg/Baumgartner (1995), p. 1095; Fassott/Eggert (2005), p. 21. For a summary of other PLS based SEM studies refer also to Wold (1980), pp. 68-69.
607 Cf. Hennig-Thurau et al. (2007).

and method, (ii) distribution assumptions, (iii) sample size requirements and (iv) specification of constructs employed.

(i) Both statistical approaches produce similar results for hypothesis testing: they deliver path coefficients and factor weights, but in fact have opposing testing philosophies. The covariance-based approach aims at achieving the highest prediction precision of the coefficients.[608] Once a researcher builds upon a well based theory, the covariance approach can be utilized as a confirmatory approach to increase the exact knowledge about the effect of sizes within the theoretical framework.[609] The variance-based method, in contrast, tries to maximize the prediction quality of the overall model.[610] It can be used in an earlier stage of theory development or in a new research environment as it has a more explorative character, although being a confirmatory testing procedure.[611]

(ii) In addition, both algorithms differ in terms of their requirements towards the distribution of indicator values. The variance-based PLS algorithm does not require any distribution assumption, while the covariance-based approach builds upon a multivariate normal distribution.[612] As this assumption is rarely true in most social science studies,[613] a robust approach is favored here.

(iii) In order for a covariance-based algorithm to converge, it requires a relatively large sample size to achieve stable results. The variance-based algorithm of PLS can already be performed with a significantly lower number of data sets. The quality of the overall model can be assessed by using re-sampling methods (jackknifing or bootstrapping). As these methods draw on multiple drawings from the same sample base, they are far less influenced by a smaller sample size. Still, the variance-based method requires a minimum sample size.[614] This study aims at showing the effects of management control under the influence of different contingency variables. In order to do so, it subdivides the sample into smaller subgroups and compares the effects within these groups.

(iv) The final criterion to determine the use of one approach is the specification of constructs to be used in the study.[615] Previous researchers argue that covariance-based systems such as

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608 Cf. Fornell/Bookstein (1982), p. 450.
609 Cf. Fassott/Eggert (2005), p. 26.
610 Cf. Chin (1998b), p. 295.
611 Cf. Chin (1998b), p. 295; Götz/Liehr-Gobbers (2004a), p. 720.
612 Cf. Fornell/Bookstein (1982), p. 442; Herrmann et al. (2006), p. 38.
613 Cf. Dijkstra (1983), p. 76; Dijkstra (1983), Scholderer/Balderjahn (2005), p. 88.
614 Cf. Chin/Newsted (1999), pp. 326-327; Gopal et al. (1992), p. 57. A minimum number of data sets remain for this study. They are calculated based on the maximum number of either path coefficients to the dependent variable or the number of indicators of the largest formative measurement model. This study uses four independent variables and uses a formative measurement model with 7 indicators. Thus, the analysis requires a minimum number of 35 data sets per subgroup.
615 Cf. Engelen (2008); Müller (2008).

LISREL are not able to incorporate formative measurement models. [616] However, they were proven the opposite as covariance-based SEMs are in fact able to include both types of measurement models.[617] Hence, this fourth criterion will not be taken into consideration further.

To study management controls in SMEs, this study utilizes conceptual elements that were previously used in large organizations. As such, it builds upon previous knowledge, but applies it in a new research environment. Despite aiming at testing hypotheses, this research approach has a rather explorative character. In addition, the restrictions of sample sizes and distribution assumptions of the covariance-based method are not likely to be met during this study. Consequently, this study utilizes the variance-based PLS approach for estimating factor weights and path coefficients. As such, this study is in line with the methods and findings of various researchers, especially in the field of marketing that turned to variance-based models for analysis, in order to overcome similar restrictions.[618] This study utilizes the software smartPLS 2.0b for all SEM related calculations.[619]

5.1.3 Partial least square algorithm

Chapter 5.1.3.1 describes the analytical algorithm being used in the variance-based PLS approach. The approach for comparing effects within specific groups is further elaborated in Chapter 5.1.3.2.

5.1.3.1 General description

In order to estimate the parameters accordingly, the algorithm uses a four step iterative process that is conducted until the solution converges. The estimation process contains four process steps in each pass that are shown in Figure 13.

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616 Cf. Götz/Liehr-Gobbers (2004b), p. 1, by mistake argue that covariance-based algorithms could not incorporate formative measurement models.

617 Cf. Scholderer/Balderjahn (2005), p. 93.

618 Cf. Ringle (2004), p. 28; Fassott/Eggert (2005), pp. 46-47; Hennig-Thurau et al. (2007), p. 11.

619 The statistical software smartPLS 2.0 can be downloaded from the website www.smartPLS.de. It is being developed under the supervision of Prof. Hansmann at the University of Hamburg, School of Business, Institute for Operations Management and Organizations by Dr. C. M. Ringle and his team. Cf. Ringle et al. (2005).

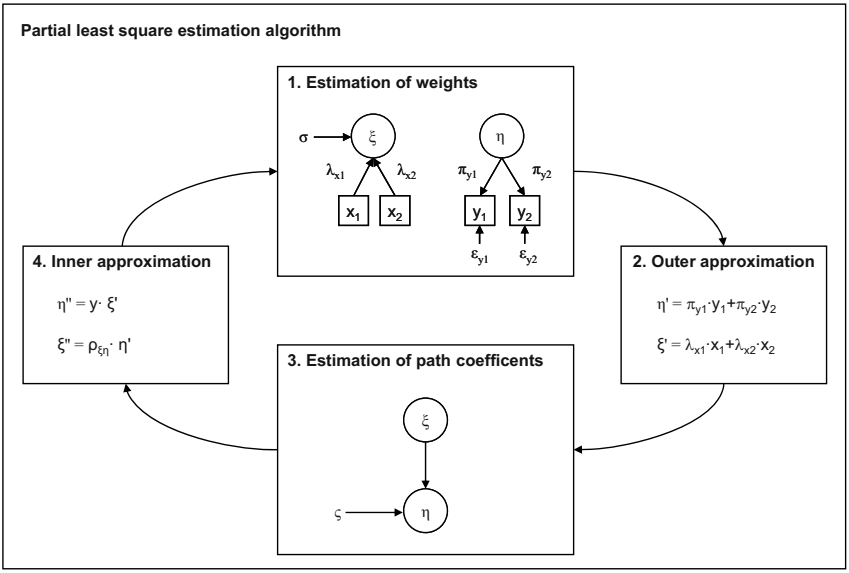

Figure 13: Partial least square estimation algorithm[620]

The indicator weights of the outer model are calculated in step 1. Depending on the measurement model, the weights are calculated by either a simple (reflective construct) or multiple (formative construct) regression analysis. The initial weights of the indicator weights are typically set to 1 or are derived from a randomized data and are only used once in the algorithm. Step 2 uses the weights and the indicator values to aggregate latent variable scores. Step 3 encompasses the estimation of path coefficients between the latent variables. During the final step, the algorithm estimates the new latent variable scores based on the previously determined path coefficients. The new latent variable scores are calculated using the weighted values of the adjacent constructs. After completion of the fourth steps, the algorithm starts again with process step number 1 until the parameters converge and the values do not change any more.[621]

Although the PLS algorithm fits the research purpose and approach, it also bears the risk of biased estimated parameters.[622] The issue of 'consistency at large' reflects the fact that the latent variables are being estimated as an aggregation of the indicators. As this measurement is associated with an error, the algorithm tends to overestimate the construct values (outer model) and tends to underestimate the path coefficient (inner model). If a construct is

620 Own illustration.
621 Cf. Haenlein/Kaplan (2004), p. 291.
622 Cf. Chin (1998b), p. 329.

measured by a larger number of indicators, this effect decreases. This study copes with this problem by utilizing constructs, each with a sufficient number of indicators.

5.1.3.2 Moderating effects and group comparisons

Contingent variables are expected to moderate the performance effect of management control forms. To analyze this, the PLS approach offers two distinct approaches:[623] The interaction term approach and the group comparison method.

The first potential approach is the *interaction term approach*. This approach incorporates the effects by multiplying the moderating factor with the supposingly influenced variable. For the analysis of a moderating effect between reflective constructs, this is done by multiplying the standardized indicator values of both variables. In the case of an interaction between formative constructs this can be achieved by multiplying the standardized latent variable scores. To investigate the potential effect of the moderator on the exogenous variables, the resulting 'new' variable is then integrated as a new exogenous variable into the overall structural model. Due to the nature of this approach, the interaction term approach is only capable of determining linear moderating effects.

The second method is the *group comparison approach*. During the first step, the moderating variable is used to split the full sample into multiple groups.[624] Then the structural equation models are treated as separate models and are, therefore, estimated independently from each other. Finally, the path coefficients are tested for significant differences between the groups using the following formula:[625]

$$t = \frac{Path\_Coefficient_{group_1} - Path\_Coeffcient_{group_2}}{\left[\sqrt{\frac{(m-1)^2}{(m+n-2)} \cdot SE^2_{group_1} + \frac{(n-1)^2}{(m+n-2)} \cdot SE^2_{group_2}}\right] \cdot \left[\sqrt{\frac{1}{m} + \frac{1}{n}}\right]}$$

In this equation m and n represent the sample size of the respective sub samples, while SE stands for the standard error of the respective path coefficients. The t-values calculated can then be compared against theoretical t-values to determine the significance of the differences in path coefficients.

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623 Cf. Avolio et al. (1999), pp. 219-221; Chin et al. (2003), pp. 191-193; Homburg/Klarmann (2006), p. 730.

624 For example this could be done by the median, average of modulus of the underlying data.

625 Cf. Keil et al. (2000), p. 315.

In relation to the group comparison method, CARTE/RUSSELL (2003) point out that a valid comparison requires a *comparability of constructs*.[626] As the structural equation models are estimated for the different groups separately, different construct values for the same constructs could result. The resulting path coefficient differences can, therefore, either result from a different indicator weight structure or are related to other objective reasons in the two groups. Therefore, the group comparison method requires a similar construct structure.[627]

The two groups incorporated in the group comparison can also be understood as two separate samples from different cultures. Hence, previous research on intercultural management studies can be taken into consideration. Following the proposal of ENGELEN (2008), this study considers two potential approaches to determine the comparability of the constructs across cultures:[628]

- Use of separate measurement models
- Comparability tests on constructs level

The initial alternative employs culture specific measurement models (emic approach) to each of the different cultures. This ensures that the construct within the respective culture actually measures the desired construct. Hence it avoids potential misunderstandings of the constructs in the different cultures.[629] As the population of the survey is based in Germany and all respondents were located in Germany, this study assumes that managers within the German culture have a sufficient common understanding of the construct meanings. Hence, no separate measurement models were used in this study. This decision is also affected by the type of analysis employed: as the overall data is cut into different subsets based on the moderator parameter values, numerous sub-samples are generated to determine the impact of the moderator. As a consequence, the sub-samples potentially overlap and can, therefore, not be measured with different measurement models each.

Second, in case a common measurement model is used, it needs to be assessed in terms of its nomological equivalence across different cultures. TRIANDIS (1994) states that "[w]e must get empirical evidence that the construct operates the same way in another culture . . . before we use it to compare the cultures."[630] MALHOTRA ET AL. (1996) claim, in the same sense, that "[c]omparability is a prerequisite for valid cross-cultural comparisons."[631] CARTE/RUSSELL

[626] Carte/Russell (2003), pp. 493-494.
[627] Cf. Engelen (2008), p. 196.
[628] Cf. Holzmüller (1995), p. 199; Engelen (2008), p. 206.
[629] Cf. Holzmüller (1995), p. 152.
[630] Triandis (1994), p. 69.
[631] Malhotra et al. (1996), p. 10.

(2003) propose two tests to determine measurement model equivalency in their paper on the errors in moderating effect measurement:[632]

- "Subgroups cannot be compared without evidence that they do not vary significantly in construct score weighting."[633] Indicators and the relevant loadings/weights to the construct play a superior role in the overall calculation of the structural model. Hence, the authors suggest the comparison of indicator weights between groups and testing them for significant differences. This ensures that indicators have an identical impact on the overall construct composition. Researchers assume an adequate level of factor weighting equivalence, if a maximum of 30% of the indicators have a significant indicator loading difference, based on 10% confidence level.[634]
- CARTE/RUSSELL (2003), building on HARMAN (1976), propose the use of the coefficient of congruence as the second assessment for the measurement model equivalency. It addresses the desired equivalency of the indicator loading structure of the overall construct. Similar factor loading structures are an indicator for identical construct equivalence. "(T)he absence of significant intercountry differences in factor loadings for each measure in the model indicates construct equivalence across countries."[635] The coefficient of congruence for the construct level is defined as follows:[636]

$$CoC = \frac{\sum Loading_{Group1,i} \cdot Loading_{Group2,i}}{\sqrt{\left(\sum Loading^{2}_{Group1,i}\right) \cdot \left(\sum Loading^{2}_{Group2,i}\right)}}$$

The CoC reaches values between 0 and 1, where a CoC of 1 indicates an identical factor loading structure of two constructs. Although a commonly accepted threshold does not exist, researchers suggest a minimum level of 0.9 in order to ensure construct comparability between groups.[637]

5.2 Measures

The following chapter presents the constructs used in the main model, moderators and control variables. As outlined in Chapter 5.1.1.1, this study employs latent variables that are

632 Cf. Carte/Russell (2003), pp. 493-494.
633 Carte/Russell (2003), p. 496.
634 Cf. Heinemann (2007), p. 276; Hiddemann (2007) p. 150; Engelen (2008) p. 210.
635 Deshpande et al. (2004), p. 15.
636 Cf. Harman (1976), p. 344; Teel/Verran (1991), p. 70; Engelen (2008), p. 211.
637 Cf. Teel/Verran (1991).

represented by a measurement model that consists of different manifest indicator variables.[638] In addition to the presentation of constructs used, the specification process of the measurement models is discussed.

Specific emphasis was put on the use of constructs previously used in management control research to ensure the adaptability to previous studies and to address the concern raised by LANGFIELD-SMITH (1997) that the "variation in the number and type of controls that have been researched makes it difficult to develop a coherent body of knowledge."[639] All measurement models were tested with managers from SMEs and academics during expert interviews and formal pre-tests to ensure comprehensibility of the indicators.[640, 641]

Specification of constructs. This section reviews the importance of the specification process for the research methodology and presents a framework for specification. Finally, the constructs used in this study are being presented. During the specification of the constructs the researcher determines the relationship and the direction of cause between the construct and the indicators. As outlined in Chapter 5.1.1.2, indicators that reflect the construct are referred to as reflective constructs. In case the construct consists of the indicators or can be constructed from them, it is considered a formative measurement model. Unfortunately, the misspecification of constructs is a common mistake in empirical research. Recent studies suggest that up to 29% of all constructs in four major journals (Journal of Marketing Research, Journal of Marketing, Journal of Consumer Research and Marketing Science) between 1977 and 2000 were specified incorrectly.[642] A similar study in Germany in the journal Marketing ZFP even yielded a misspecification rate of 81%.[643] The majority of inaccurate specifications were made in the context of formative constructs that were mistakenly specified as reflective ones. Potentially, this is due to the fact that formative constructs just gained importance and practical application in recent years.[644]

As an answer to the frequent misspecifications in the past, researchers developed particular guidelines for specification of constructs.[645] The approach of JARVIS ET AL. became well accepted and will be applied to this study.[646] It consists of four criteria for specification: (i)

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638 Cf. Herrmann et al. (2006), p. 36.
639 Langfield-Smith (1997), p. 226.
640 Pre-tests were initially conducted using the written survey instrument and were extended to the online survey tool after completion. The selected testers were asked to provide feedback on comprehensiveness, methodology and potential alternative aspects of the constructs.
641 Cf. Brettel et al. (2006), p. 12.
642 Cf. Jarvis et al. (2003), p. 206.
643 Cf. Fassott/Eggert (2005), pp. 42-45.
644 Cf. Helm (2005); Reinartz et al. (2004).
645 Cf. Edwards/Bagozzi (2000), pp. 155-157; Rossiter (2002), pp. 305-306.
646 Cf. Jarvis et al. (2003), pp. 202-205 and the discussion of this approach in Homburg/Klarmann (2006), p. 731; Götz/Liehr-Gobbers (2004a), p. 718 and Fassott/Eggert (2005), pp. 71-72.

direction of causality, (ii) interchangeability of indicators, (iii) covariance of indicators, and (iv) existence of a nomological net. First, the direction of causality determines the type of construct. In a reflective construct the direction of causality runs from the construct to the indicators. The construct influences the indicators; a change in the construct is, therefore, reflected in the indicators.[647] In case the causality runs from the indicators to the construct, it is referred to as 'formative.' A change of the indicators determines a change of the construct. Second, if the indicators are interchangeable and can be replaced by another indicator, they are regarded as reflective as well.[648] In contrast, if an indicator is dropped and the overall construct meaning changes significantly, it is considered to be of formative nature.[649] Covariation among indicators can be used as a third criterion to determine the construct's specification. A construct is considered to be formative, if an increase of one indicator does not increase other indicators in the construct simultaneously.[650] Finally, the existence of equal antecedents and consequences between all indicators can be utilized to determine the specification. The indicators of a reflective construct share the same nomological net. On the other hand, indicators of a formative construct can result in or from different determinants.[651]

An overview of the criteria and the characteristics of both reflective and formative constructs are visualized in Table 4.

[647] Haenlein/Kaplan (2004), p. 288; Fornell/Bookstein (1982), p. 442.
[648] Cf. Bollen/Lennox (1991), p. 308.
[649] Cf. Bollen/Ting (1998).
[650] Cf. Götz/Liehr-Gobbers (2004a), p. 718.
[651] Cf. Jarvis et al. (2003), p. 203.

	Reflective model	Formative model
Direction of causality	From construct to indicators	From indicator to construct
	Indicators are manifestations of the construct	Indicators are defining characteristics of the construct
Indicator interchange-ability	Indicators should be interchangeable	Indicators need not be interchangeable
	Dropping indicators should not alter the conceptual domain	Dropping indicators may alter the conceptual domain
Indicator covariation	Indicators are expected to covary with each other	Not necessary for indicators to covary with each other
Nomological net of indicators	Indictors are required to have the same antecedents and consequences	Indicators are not required to have the same antecedents and consequences

Table 4: Construct specification decision rules[652]

The Tetrad-test[653] as a potential statistical specification test, proposed by BOLLEN/TING, is not carried out in the course of this study, as it neither indicates a specification nor disproves it.[654] This decision is in line with HOMBURG/KLARMANN (2006) who also propose a qualitative specification approach.[655]

5.2.1 Main model

As outlined in Chapter 2.2.2.3, this study investigates the impact of the four important management control forms – results control, behavior control, personnel control and cultural control – on the performance of SMEs. The following section describes the constructs and their specification as reflective or formative constructs.

Results control is operationalized by using the construct output control from the study of JAWORSKI ET AL. (1993).[656] JAWORSKI ET AL. (1993) adapted and expanded the 5 indicator constructs from a previous work of OUCHI/MAGUIRE in 1975. It has already been used in previous publications. The construct of JAWORSKI ET AL. combines three major control

652 Simplified from Jarvis et al. (2003), p. 203.
653 Cf. Bollen/Ting (2000), pp. 5-8.
654 Cf. Eberl (2006), pp. 657-659.
655 Cf. Homburg/Klarmann (2006), p. 731.
656 Cf. Jaworski et al. (1993).

perspectives of defining, measuring and incentivizing target achievement. During previous publications, this construct has been used from the perspective of an employee that is being controlled by his supervisor. As this study considers management control to be the technique executed by a managers with their subordinates,[657] the perspective of the construct was changed from an 'I' point of view to a 'My direct employees' point of view.

The direction of causality runs from the indicators to the construct, as they reflect subsequent process steps of results control. The expected covariation amongst the indicators is of a medium level and the indicators cannot be exchanged. Consequently, the construct is specified as formative.[658] Table 5 summarizes the construct and its indicators.

Construct	**Results control**
Specification	Formative
Source	JAWORSKI, STATHAKOPOULOS & KRISHNAN (1993), p. 67 Building on OUCHI & MAGUIRE (1975), p. 560-561
Question	Please describe how the statements below characterize your relationship with your direct subordinates (do not agree at all, fully agree).
Item	**Description**
1	Each employee has individual goals.
2	Target achievements of my employees' goals are controlled by me.
3	Employees have to comment if they do not meet their individual goals.
4	My employees get feedback on their goal achievement when projects / tasks are accomplished.
5	Salary increases and bonus payments (or other compensation components) of our employees are linked to goal achievements.

Table 5: Operationalization "Results Control"[659]

The measurement of *behavior control* builds on the construct "behavior control" used by JAWORSKI ET AL. (1993) in their study on control combinations in marketing.[660] It describes

[657] See Chapter 6.1.1 for a description of the key-informant of this study.

[658] This specification as a formative construct is in contrast to other researchers, such as Engelen (2008), p. 223 or Claas (2006), p. 525 both of which specify this construct as reflective. As already stated in this chapter, recent studies suggest frequent misspecifications in the marketing area and a detailed review of previous specification is, therefore, necessary.

[659] Own illustration.

the consequences of behavior control in the daily management and asks how strong they are present in the respondent's organization. Similar to results control, the measure was previously developed for an employee to evaluate his superior. It was, therefore, adjusted to match the perspective of this superior executing control over his subordinates.

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The measurement model is specified as reflective, as the direction of causality for this construct runs from the construct to the indicators. The indicators reflect the outcomes of behavior control and are, therefore, expected to show significant covariation.

Construct	**Behavior control**
Specification	Reflective
Source	JAWORSKI ET AL. (1993), p. 67. Building on OUCHI/MAGUIRE (1975), p. 560-561.
Question	Please describe how the statements below characterize your relationship with your direct subordinates (do not agree at all, fully agree).
Item	**Description**
1	My employees discuss the necessary work steps for achieving their targets with me.
2	If targeted results are not achieved, my employees discuss the next relevant steps with me.
3	During projects, my employees always know where they stand in respect to their target achievement.
4	My employees and I define the most important work steps for routine tasks.
5	My employees discuss the necessary work steps for achieving their targets with me.

Table 6: Operationalization "Behavior control"[661]

The concept of *personnel control* was operationalized by the construct "input control" from the 1992 study of SNELL on strategic human resource management. It captures "the degree of emphasis placed on rigorous staffing procedures and the opportunity provided for subordinate training and development."[662] Although the study offers a principal component analysis and a

[660] Cf. Jaworski et al. (1993), p. 67. Similar to the proposed construct of results control, the measure was orginally developed as well by Ouchi/Maguire (1975), pp. 560-561 and was further developed by Jaworski et al.

[661] Own illustration.

[662] Snell (1992), p. 326.

discriminate analysis, it lacks a formal specification for the construct. The indicators describe the different aspects of a tight HR management control in place and, therefore, cannot be replaced. As the implementation of the HR management techniques also result in the implementation of management control, the indicators can be understood as antecedents of personnel control and they result in a formative specification of the measurement model. Skipping one indicator would also significantly change the meaning of the overall construct.

Construct	**Personnel control**
Specification	Formative
Source	SNELL (1992), p. 326.
Question	Goal oriented behavior of employees can be achieved by specific recruiting and development processes. Please describe how the statements below characterize your organization (do not agree at all, fully agree).
Item	**Description**
1	Applicants have to pass a number of interviews and evaluations before they are hired.
2	Applicants have a number of opportunities to show the range of their skills.
3	We place emphasis on hiring the best-suited applicant for a particular job position.
4	We regard the training and development of talented employees as an important necessity.
5	We have put much effort into establishing a well-suited recruiting process for our company.

Table 7: Operationalization "Personnel control"[663]

Although JAWORSKI ET AL. offer a reflective approach to *cultural control*, their approach to measure cultural control with two indicators is rather focused on the feelings of an individual towards the overall organization rather than reflecting cultural control.[664] Following the proposal of HIDDEMANN in his study[665] of operational management in young enterprises, this study utilizes a modified construct previously used by JOHNSON ET AL. (2002) [666] which was originally developed by MOWDAY ET AL. (1979). [667] In the research field of organizational

[663] Own illustration.
[664] Cf. Jaworski et al. (1993), p. 67.
[665] Cf. Hiddemann (2007), p. 75.
[666] Cf. Johnson et al. (2002), pp. 1159-1160.
[667] Cf. Mowday et al. (1979).

commitment, this construct has already been used numerous times.[668] It combines the perceived level of loyalty of the employees towards the enterprise and the perception of corporate culture in five indicators.

The direction of effects is expected to run from the construct to the indicators, as the indicators represent the successors and consequences of cultural control rather than tools or techniques. The indicators are expected to covariate strongly and share the same nomological net. In accordance with the previous research of HIDDEMANN, the measurement model was specified as reflective.[669]

Construct	**Cultural control**
Specification	Reflective
Source	JOHNSON ET AL. (2002), p. 1159-1160;
Question	Corporate culture can complement results control. Please describe how the statements below characterize your organization (do not agree at all, fully agree).
Item	**Description**
1	Our employees are ready to work more than expected for contributing to our company's success.
2	Our employees are very loyal to our company.
3	There is a high congruence of our company's values and the individual values of our employees.
4	Our company's destiny is very important to our employees.
5	Our employees tell their friends, that our company is a good employer.

Table 8: Operationalization "Cultural control"[670]

The measurement of *company performance* can be based either on objective or subjective criteria. Objective indicators typically consist of financial data like revenue, market share, or return on assets, while a subjective measurement builds on the personal judgment of key stakeholders on key indicators, typically in comparison to own plans, competitor achievements or the industry average. There are two basic disadvantages associated with the measurement of objective performance. First, in the context of young firms, numerous researchers criticize the use of objective performance measures. Previous research yielded

668 Cf. Price (1997), p. 336; Ketchand/Strawser (2001), pp. 222-223; Hiddemann (2007), p. 78.
669 Cf. Hiddemann (2007), p. 79.
670 Own illustration.

significant differences between young organizations in terms of different business targets,[671] accounting standards[672] or duration to break even.[673] The outcomes of an objective performance measurement, therefore, would have only a very limited comparability across life cycle stages and industries.[674] Second, objective performance measures typically have a low acceptance rate by the respondents of small enterprises as certain data is not available[675] or the answer even requires divulging predominantly non-public financial data[676] to the researcher.

Choosing the appropriate construct to capture company performance is highly relevant for the correct interpretation of the findings. For example, the control researcher LANGFIELD-SMITH (1997) argues that "[w]hile Simons (1987a) and Merchant (1985b) defined effectiveness as financial performance, it can be argued that this is not always an appropriate definition. For example, in a prospector [in this case a strategic orientation, J.H.] that focuses on product innovation high (short-term) profits may not be considered a good measure of the effectiveness of their strategy. Criticisms have also been voiced concerning whether ROI is even adequate for measuring the performance of financially-oriented firms . . . If the measure of effectiveness is not appropriate for all the firms studied, then the results of analyses must be interpreted carefully."[677] Thus, measures for organizational performance should be selected carefully and appropriately.

In order to ensure comparability of results and to reduce the risk of non-response to the survey, this study employs a subjective performance measurement. This measurement still bears the risk of measurement error due to the personal estimation of the respondent. In relation to this risk, DESS/ROBINSON showed in their comparative study of subjective and objective measures on organizational behavior, that the "perceptions of relative improvement were strongly correlated with objective measures."[678]

This study uses the subjective company performance construct of BRETTEL ET AL. (2005) that has been used in various previous research efforts,[679] which has been complemented with an indicator from HOMBURG/PFLESSER, as used by MÜLLER (2008).[680] In relation to the

[671] Cf. Knecht (2002), p. 107.
[672] Cf. Dess/Robinson (1984), p. 267.
[673] Cf. Ven et al. (1984), pp. 90-91; Chrisman et al. (1998), p. 7.
[674] Cf. Goedecke (2007), p. 172.
[675] Cf. Sapienza et al. (1988), p. 46.
[676] Cf. Dess/Robinson (1984), p. 266.
[677] Langfield-Smith (1997), p. 226. For further details see Simons (1987) and Merchant (1985b).
[678] Dess/Robinson (1984), p. 271. For a second study on the relationship between subjective and objective performance measurement refer to Chandler/Hanks (1993), p. 393. This study also encompasses a summary of relevant key indicators and a detailed ranking in terms of acceptance.
[679] Brettel et al. (2005), p. 11; Kessell (2007), p. 145; Hiddemann (2007), p. 78.
[680] Cf. Homburg/Pflesser (2000b), p. 460; Müller (2008), p. 122.

applicability of the construct to the target population, the construct has been previously used both in the context of young and established[681] organizations and is, therefore, expected to measure performance in both populations. The direction of causality of this construct runs from the indicators to the construct, as the overall success of a company is composed of different facets such as growth, market share or level of customer loyalty. Because the indicators cover different aspects of company success they can neither be seen as interchangeable nor can a significant covariation be expected. Finally, there is no difference between the nomological net of the indicators. As the first three criteria match the formative specification, the measure is specified as a formative construct. Table 9 summarizes the construct composition and lists up the seven indicators employed in this study.

Construct	**Subjective company performance**
Specification	Formative
Source	Brettel et al. (2005), p. 20; Claas (2006), p. 167; Hiddemann (2007), p. 78; Kessell (2007), p. 145; Müller (2008), p. 122.
Question	Please complete the following statements in relation to the development of your organization (not satisfied at all, very satisfied)
Item	**Description**
1	Compared to our most important competitors we are … with the economic development of our company.
2	Compared to our most important competitors we are … with the growth of our company.
3	We are … with the profit forecast for the next years.
4	Compared to our most important competitors we are … with the success of our products.
5	Compared to our most important competitors we are … with the new customers.
6	Compared to our most important competitors we are … with customer retention.
7	Compared to our most important competitors we are … with our advancements in market share.

Table 9: Operationalization "Subjective company performance"[682]

In addition to using the subjective performance measure, this study also collected data using an objective performance measure in the questionnaire. This study employed the objective

[681] Cf. Güttler (forthcoming), p. 140; Voll (2008), p. 103.
[682] Own illustration.

performance measure as used by Kessell (2007).[683] However, after collecting and analyzing the data, the author decided to continue the analysis with the subjective performance measure. First, as reviewed above the subjective measure is expected to capture the concept of organizational effectiveness to the greatest extent. Second, significantly less data sets would be available for analysis in case the analysis would build on the objective performance measure.[684] Third, in contrast to significant previous research[685] providing evidence for the strong correlation between objective and subjective performance measures, this study found deviations between both measures. Both measures only show a rather low correlation of 0.211 (significance level of 0.01).[686] To sum it up, the subjective performance measure showed strong conceptual and statistical suitability and was, therefore, selected for this study.

5.2.2 Moderating and control variables

After highlighting the constructs employed in the main model, the constructs representing the moderating and control variables are discussed.

The conceptualization of the construct *company life cycle stage* was initially based on a life cycle model with four life cycle steps as developed by KAZANJIAN (1988).[687] CLAAS (2006) complemented it with a fith life cycle stage from GALBRAITH/VESPER (1972).[688]

683 Cf. Kessell (2007), pp. 140-145.

684 Twenty-two (22) data sets lacked data on the objective company performance measures. This would result in 7% less data sets meeting the requirements of missing data.

685 Dess/Robinson (1984), p. 271; Chandler/Hanks (1993), p. 393.

686 A potential reason for this could be the unwillingness of the respondents to provide meaningfull objective performance measures (such as a profit margin) to the researcher. This unwillingness could be rooted in doubts about confidentiality or the actual need for this kind of data in such types of research studies.

687 Cf. Kazanjian (1988), pp. 1497-1499.

688 Cf. Galbraith (1972), p. 74 and pp. 78-79; Claas (2006), p. 168.

Construct	Company life cycle stage
Specification	– not applicable –
Source	KAZANJIAN (1988), p. 279; CLAAS (2006), p. 167-169.
Question	Your organization accomplishes certain stages during its development. Please choose the stage that matches your organization best. Please choose only one stage.
Item	**Description**
1	The focus of our activities is on new product development, design, financing and business development.
2	Our organization has a successful product/service, which is demanded by the market. We have both orders and revenues. We are able to sell our product / services, but have to establish business operations.
3	Our organization is characterized by strong revenue growth. Key focus is on the large scale production of our product / services.
4	We continue to grow, but revenue growth decreases to overall market level. The 2nd or 3rd version of our products entered the market successfully or is just about to do so. We focus on enhancing profitability and to scale up.
5	Key focus of our activities is the diversification of our business. We develop other product / service versions and new product / service offerings. Gradually, we aim at new geographical markets.

Table 10: Operationalization "Company life cycle stage"[689]

In addition to the constructs presented above, this study investigated several other manifest variables that were included in the questionnaire. The variables are required for further analysis of the data and allow the segmentation into different subgroups:

- *Company age.* To determine the age of the organization, the respondents were asked to provide both the year of foundation and the year of market entry.
- *Company size.* The number of full time equivalent employees was used to determine the absolute size of the organization.
- *Management experience.* Management experience covers the management expertise present in the top management team. The CEO was asked to provide the number of the members in the top-management team and the accumulated years of experience. This measure was then used to derive an average experience level of each member of the top-management team.

[689] Own illustration.

- *Industry vs. service companies*. The respondents were asked to point out if they are an industrial or a service organization.
- *Financial sources:* The respondents were asked to determine which types of equity stakeholders invested in their organization. The list included family and friends, business angels, venture capital funds, strategic partners (corporations) or public organizations.

6 Survey design and sample

During the previous chapter the partial least square approach was presented in detail as it is the statistical method for evaluation of the research model. Chapter 6.1 describes the final preparation of the survey, the aggregation of the sample data as well as the invitation and survey process. Subsequently, the data is evaluated with regard to missing data and potential biases (Chapter 6.2). Finally, prior to the data analysis itself, the required levels of significance for the following chapters are defined (Chapter 6.3).

6.1 Preparation of the data sample

6.1.1 Selection and design of data collection method

The survey will be conducted using the key-informant method. The key informant in this context is a person who is able to communicate information that can be generalized and which, specifically, does not communicate personal opinions or habits.[690] In general, the key informant is selected based on his specific knowledge, characteristics or the position he holds inside an organization.[691] In this study the managing director of the SME is selected as the key informant, based on the assumption that he oversees internal processes best and can make valid statements concerning the performance of the firm at the same time.[692] More specifically he can comment on the management controls in place and the relationships between him and his subordinates. In case a firm is managed by two or more directors, the chief executive officer (CEO) was selected as the key informant.

Selecting the managing director also has two other distinguished advantages: first, it allows one to determine how management control operates and "why organizations do the things they do," since, in order to know "why they perform the way they do, we must examine the people at the top."[693] As top-managers have a strong influence on the "conduct and outcomes of their firms,"[694] and are the driver of management control implementation and design, they are the key informant to be addressed in order to understand controls and their outcomes.[695] Secondly, management control practices potentially vary across different levels and functions of the firm.[696] For example, the controls employed differ for a research engineer in the

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690 Cf. Ernst (2003), p. 1250.
691 Cf. Bagozzi et al. (1991), p. 423.
692 Cf. Bart/Baetz (1998), p. 836.
693 Hambrick (1989), p. 5.
694 Snell/Youndt (1995), p. 712.
695 Cf. Davila/Foster (2005), pp. 1062-1063; Davila/Foster (2007), p. 930.
696 Different functions require different forms of control. E.g., sales employees are typically controlled by outcome measurement, as their performance can be measured by their revenues. Research & development, on the other hand, is difficult to be measured in terms of its outcomes or the research process itself. Hence, different corporate functions require different forms of control. For further discussion of different requirements of corporate functions refer to Ouchi

development department from the controls used for administrative employees. To level out these functional differences, this study assumes that the management control forms employed between the managing director and his direct subordinates are comparable. Although being responsible for different functions or countries, the subordinates of a managing director are expected to share common characteristics like personal responsibility for target achievement, interaction with other top-management members or leadership responsibilities. Consequently, the managing directors in this study are asked to provide information on the relationships with their direct subordinates.

Three different survey methodologies can be distinguished to gather data for empirical analysis: mail surveys, personal (telephone-based) interviews, and a web (online) survey. In a mail survey, the potential respondent receives a letter asking for his participation including a paper copy of the survey. During interviews, personal information is gathered either during an in-person interview or telephone interviews with the respondent. Finally, web surveys use the internet to present the survey and to collect the data. To select the most appropriate type of survey method, this study employs the framework of WEIBLE/WALLACE (1998) that proposes to not only consider data quality as a decision criterion but also the associated efficiency.[697]

The *data quality* of survey methods can be described by its coverage, measurement and non-response errors:[698] coverage error refers to the "requirement of giving each member of a defined population a known chance of being surveyed."[699] In relation to the survey methodology, the key question is whether certain parts of the population are excluded from participation in the study. Mail surveys and phone interviews are expected to be exposed to a rather low level of coverage error, as nearly all enterprises in Germany can be expected to be equipped with either a mail address or a phone.[700] Web surveys, on the other hand, are potentially affected, as the access and usage of the internet is required to participate. However, due to the innovative nature of surveyed organizations and the related exposure to innovative technologies the risk is considered rather small for this study. Two key reasons for a measurement error can be distinguished. First, respondents potentially misunderstand indicators if the indicators were not tested thoroughly. In contrast to interviews, during which a respondent could clarify his concerns, mail and web surveys do not allow this interaction due to their nature. Second, the data entry process itself is potentially subject to errors. As a result of improper transcription of interviews or accidental typing errors while entering paper-based survey data, the information analyzed may not be consistent with the actual data. Web

(1979), p. 843; Jaworski/MacInnis (1989), pp. 406-407; Jaworski et al. (1993), p. 57; Davila (2000), pp. 383-384.

697 Cf. Weible/Wallace (1998), p. 20.

698 Cf. Dillman et al. (1998), p. 2.

699 Dillman et al. (1998), p. 2.

700 Cf. Müller (2008), pp. 134-135; Wiedenfels (forthcoming), p. 152.

surveys, in contrast, bear the advantage of immediate input into an underlying database without a need for any manual or instant consistency checks to filter errors. The risk of respondents not answering the survey due to a lack of motivation or technical difficulties is referred to as the non-response error.[701] The motivation to participate in a survey is another relevant aspect. Besides conceptual factors, such as the individual's interest in the research topic, survey design was found to be a key driver for response rates.[702] Due to the significant experience with mail based surveys and its design, response rates of mail surveys typically exceed that of web surveys.[703] As a consequence of the intense personal interaction during interviews, they are assumed to be associated with satisfying response rates as well.[704] The influence of technical difficulties are expected to be of low relevance for mail surveys and personal interviews, while web surveys are potentially subject to this; however, this can be mitigated by extensive pre-testing of the online instrument.

Efficiency is not of equal, but of significant importance for data quality. WEIBLE/WALLACE (1998) distinguish between cost and time efficiency to evaluate survey methods.[705] With regard to costs, mail surveys are the least-favorable alternative: printing, deployment and postage cause significant expenditures; environmental factors not even considered.[706] In contrast, personal interviews are far more efficient, as they only require a telephone conversation with the respondent. In the same way, the only cost associated with performing an online survey is the requirement to purchase an academic version of a professional online-survey tool.[707] With regard to time efficiency, mail surveys are associated with significant preparatory effort for printing and envelopment. While interviews demand only little preparation, web surveys require considerable preparation effort for setting up the survey software. However, the three alternatives significantly differ in relation to their response times: web surveys are by far the fastest method, due to its immediate feedback through the online platform, while mail surveys are characterized by substantially longer response times.[708] GRANELLO/WHEATON (2004) suggest that one of the key advantages of web surveys in fact their "dramatically decreased response times."[709] Scheduling and conducting the interview demands not only a considerable amount of effort from the researcher but also extends the response time, if not conducted simultaneously.

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701 Cf. Couper (2000), p. 473; Grandcolas et al. (2003), p. 545.
702 Cf. Couper (2000), p. 474.
703 Cf. Couper (2000), p. 474.
704 Cf. Wiedenfels (forthcoming), p. 152.
705 Cf. Weible/Wallace (1998), p. 20.
706 Adressing 3,000 respondents with a 6 page survey would result in 18,000 pieces of paper plus 3,000 envelopes used.
707 The software package used for this project (www.unipark.de) is available for EUR 50 for the duration of a six month period.
708 Cf. Weible/Wallace (1998), p. 23.
709 Cf. Granello/Wheaton (2004), p. 388.

In summary, although the mail survey is expected to yield the best response rates, it is associated with high acquisition costs and long response times. Telephone based interviews generate data with the highest level of quality, but due to the required personal interaction, they are at the same time associated with significant effort and time to collect the required data for this study. Hence, this study uses an online survey to gather respondent data as it combines high-quality data with lower costs and quick response times. The risk of measurement and non-response errors are mitigated by using pre-testing as well as an intuitive and well-established technological platform for the conduct of the survey. To address mail survey affine respondents as well, the invitation mail contained a link to an electronic document containing the full survey for download, including a cover for mail or fax transmission.

As outlined above, written surveys, in contrast to personal interviews, are usually criticized for their low response rates.[710] By observing certain rules and the results of various research papers, this study intends to increase the response rate significantly. In particular, this is achieved by both optimizing the invitation e-mails and the online survey. The invitation e-mails were developed with the following considerations:[711]

- Use of the name of the research entity: by using the name, the logo of the university (RWTH Aachen) and the name of the professor (Prof. Dr. Brettel) in the e-mail and the subject header, the study demonstrates its scientific and non-commercial nature.
- Personal salutation: if available, the names and academic titles of the potential respondents were used to give the invitation a personal touch.
- Exclusive nature of the survey: the invitation highlights that only owners and top managers of SMEs are contacted to participate in this survey. This is done in order to demonstrate the exclusive selection of participants.
- Incentive: a management summary and practical recommendations were offered to the managers in exchange for their contribution to the survey.
- Confidentiality: full confidentiality and non-disclosure of personal information were assured to all participants.
- Deadline: the deadline was not included in the invitation mail, as this could be considered impolite by the respondent.
- Appeal for participation: the participants were asked to share their expert knowledge and their experiences with the researcher. By addressing the pride in their experience, it addresses an egoistic motive.

[710] Cf. Diamantopoulos/Schlegelmilch (1996), p. 505.
[711] A sample e-mail invitation letter can be found in Appendix A; for the list of considerations see also Müller (2008), pp. 135-138.

- Transmission of invitation mail: in order to reach the respondents at a time with low usage of e-mails, the invitation e-mails were transmitted at 11 a.m. in order to be answered before or just after lunch.

In case the respondents failed to answer, the participants received a maximum of two reminders. Although MITCHELL/BROWN (1997) found a positive, but non-significant effect of the use of reminders on the response rate,[712] this study followed examples of the near past that yielded substantial influence of reminder e-mails.[713] All participants, who failed to answer[714] during 3 weeks after receiving the initial invitation mail, received a first reminder notice. If they did not answer 3 weeks after receiving the first reminder, they received a second reminder e-mail.[715] Both reminder notices were based on the invitation e-mail, but differed in the following two characteristics:

- Deadline: although the first e-mail and the first reminder did not contain a final deadline for the submission of the survey, the second reminder contained a final deadline at which the survey will be closed.
- Appeal for participation: as egoistic motives were the primary appeal addressed in the initial e-mail, the second message introduced the dissertation of the author as an alternative appeal. The final e-mail focused solely on the dissertation and the altruistic motive to support the author by participation.

Besides the written communication in the form of the invitation and reminder e-mails, the layout of the online survey itself is of crucial importance for the acceptance and strong response rates.[716] Therefore the web survey builds on the following considerations:

- Welcome page: the personalized link in the e-mail transferred the respondent to the initial survey page, which contained detailed information on the purpose of the survey, the estimated duration, information on the respondents addressed and a friendly picture of the researcher in order to reach a perceived obligation to answer the researcher.
- Progress indicator: in contrast to mail surveys and phone interviews, web-surveys bear the disadvantage that respondents are unable to estimate the remaining duration of the survey. To avoid any demotivation of the respondent and to increase transparency, a progress indicator was inserted on every survey page, specifying the achieved progress in per cent.
- Mandatory questions: mandatory indicators are used to enforce answers for information which is required for further analysis. However, respondents are potentially

712 Cf. Mitchell/Brown (1997), pp. 858-860.
713 For example Claas (2006), pp. 172-174; Heinemann (2007), p. 230; Müller (2008), pp. 136-137.
714 If respondents refused to participate, they were excluded from the further reminders list.
715 A sample of the first and second reminder e-mail letters can be found in Appendix B and C respectively.
716 Cf. Diamantopoulos/Schlegelmilch (1996), pp. 514-525.

unable or unwilling to answer mandatory indicators, which might result in demotivation to conduct the survey further. To avoid any additional abortion effects due to demotivation, the survey contained only two mandatory questions on corporate age and the current life cycle stage.

- Page layout: the online survey consisted of 14 pages containing different sections of the questionnaire. Most of the pages contained only one question with the related indicators in order to avoid the need to scroll the screen. Sections with less importance for the overall model (e.g. moderating variables) were placed after the questions concerning the company performance. In case a respondent aborts the survey right after the performance measures, the data set could still be used for the overall model. The layout and graphical interface was specifically developed to transmit a certain level of legitimacy and trustworthiness of the survey.

6.1.2 Aggregation of sample

This study aims at providing results for the effect of indirect control forms on company performance in SMEs and the moderation of growth oriented factors such as age, size or life cycle stage. Hence, the primary research objects are growth oriented organizations that are expected to experience these phases. Innovative and research oriented SMEs are an ideal research object in this case, as they are typically associated with a significant growth potential.[717] To facilitate a broad mix of industries and to avoid potential agglomerations of specific industries, the study included a broad variety of innovative industries. This approach also allows one to make further generalizations.[718] Innovative companies are defined by their association to certain, innovative industry sectors.[719] In Germany, the Fraunhofer Institute for Systems and Innovation Research (ISI) developed a classification scheme for innovative companies based on their industry code, which is used to determine the innovative SMEs in this study.[720]

As a basis for conducting the suvey, this study used a non-public database of the chair WIN[721] at RWTH Aachen University consisting of approximately 38,000 different companies that was constructed using federal data from the German central trade register (‘Handelsregister’). After removing organizations with more than 250 employees[722] and non-innovative Industries, a sample of approximately 4,700 organizations was drawn using a random selection

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717 Cf. Brettel et al. (2000), p. 19; Licht/Nerlinger (1998), p. 1005; Claas (2006), pp. 170-171.
718 Cf. Heinemann (2007), p. 246.
719 This study employed the industry classification WZ-93 from 1993 to select innovative industries.
720 Cf. Grupp/Legler (2000).
721 Chair of business administration for engineers and scientists (German: “Wirtschaftswissenschaften für Ingenieure und Naturwissenschaftler” WIN) at the RWTH Aachen University.
722 For the definition of SMEs in this study, refer to Chapter 2.1.2.

model. The list of companies was then manually updated with important information such as name of the contact person, their e-mail address and year of foundation using public information or professional databases (e.g., BVD Markus database). After eliminating companies which do not match the required criteria, the remaining sample of 4,087 companies was used to investigate the effects of management control in SMEs.

6.1.3 Conducting the survey

In preparation of the survey, 7 interviews were conducted with both managers of SMEs and academic experts in the field of management control and small business management. Their feedback helped to increase the comprehensibility and the layout of the survey; however, it yielded only minor alterations to the indicator descriptions and the layout.

The survey was conducted between September and November 2007 using the tool Survey Center 5.0 of the company Globalpark.[723] By integrating survey layout, e-mail invitations as well as data management, Survey Center 5.0 allows to handle every aspect of the survey within one integrated platform. The invitation e-mails were developed using the considerations discussed in Chapter 6.1.1 to ensure an optimal response rate. Besides the academic title and the name of the potential participant, the invitation e-mail contained a personal access code which ensured one-time participation. In case the participant preferred the download of the survey, the e-mail also provided an address where the survey could be retrieved as a PDF-file.

Out of the 4,087 invitation e-mails transmitted, 398 messages returned without being delivered to the participants on account of wrong e-mail addresses or other technical problems. A total number of 86 respondents failed to respond to the survey. Two companies were not taken into consideration, as they were previously closed down. In 14 cases, the company had no employees to control and in 15 cases the addressees were no longer members of the company anymore. Another group of respondents declined to participate on purpose: 25 of them explained that their current time schedule was too tight, 20 said that they were not interested in this topic and another 10 pointed out that the management team decided not to participate in any surveys at all.

After deducting those respondents from the original sample size of 4,087, the revised sample contained 3603 potential participants. In all, 702 participants were attracted to the initial page of the survey (cooperation rate of 16.8%[724]), out of whom 363 respondents completed the

[723] www.globalpark.de, last access: 22.11.2008.

[724] The cooperation rate is defined as the share of feedback in relation to the successful transmitted invitations (363 + 339) / (4087 – 398).

survey successfully,[725] which amounts to a participation rate of 10.1%. In comparison to other studies of management topics in SMEs this can be seen as satisfactory.[726]

The invitation e-mail and the first reminder yielded both 35% responses, while the last reminder accounted for 30% of the answers. The findings of this study are in line with the studies of previous authors who suggest that the majority of responses would come within 2 days after the transmission.[727] Figure 14 illustrates the return of answers by contact sequence and the distribution over time after invitation.

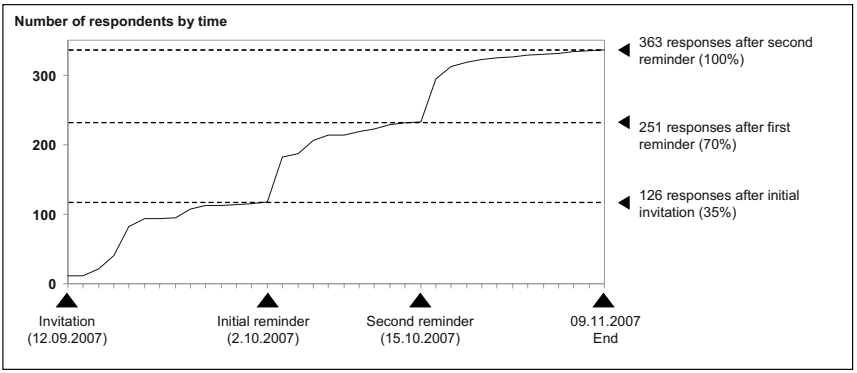

Figure 14: Distribution of respondents along time[728]

6.2 Assessment of the data sample

During the following section the collected data is reviewed in relation to is applicability for further statistical analysis. The data sets which do not meet the study's criteria are eliminated in Chapter 6.2.1. Chapter 6.2.2 presents the method adopted in this study to deal with missing data. The generalizability of the findings is ensured by testing the sample's representativeness in Chapter 6.2.3. Potential biases, resulting in a deviation of recorded values from the true values, are evaluated in Chapter 6.2.4, followed by a descriptive analysis of the sample data in Chapter 6.2.5.

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725 A total number of 339 participants did not finish (= continue until subjective performance measurement construct) the survey.

726 Comparable web survey studies yielded a participation rate between 10% (Güttler (forthcoming), and Voll (2008)); 20% (Bourke/Fielder (2003), pp. 16-17 and Klassen/Jacobs (2001), p. 720).

727 Refer also to Müller (2008), p. 132}. Exception is the first invitation as the transmission process was delayed to a technical problem.

728 Own illustration.

6.2.1 Responses

A total number of 363 respondents participated successfully in the survey.[729] However, not all responses are expected to meet the requirements and specifications of this study. A four step approach was adopted to ensure conformity with the requirements.

In a first step, the data sets were analyzed in relation to the amount of missing data of the exogenous and endogenous variables. In case the number of missing values per data set exceeds a certain threshold, the validity of the other answers could be questioned. Building on GREVE (2006), this study eliminates all data sets with more then 10% missing values in the exogenous variables.[730] Based on this rule, 4 companies were removed from the sample. Subsequently, the data sets were evaluated in relation to the missing values of the endogenous variable. HAENLEIN (2004) proposes a rather high maximum level of 50% missing values; however, this study employs the rather conservative approach of 30% missing values as proposed by ROTH/SWIZER (1995).[731] As a consequence, 28 companies were eliminated from the sample. The relatively high number of eliminations during this step is expected to be associated with the sensitivity of the requested data. In addition, the number of missing values by indicator was determined. Out of the 63 indicators included in the analysis, no variable had more than 2% missing values. Only 2 variables had missing values larger than 1% and equal or less then 2% whereas 37 variables had missing values between 0% and 1%. In total, the data set contained 0.2% missing values, which can be seen as highly satisfying, as the level of missing values is typically between 1% and 10% in social science research.[732] Hence, no indicators have to be eliminated due to systematic data absenteeism. Table 31 summarizes the missing data by indicator. It can be found in Appendix F.

In a second step, the sample was screened for any remaining companies that are derivative foundations (such as spin-offs of large organizations or management-buy-outs). By using an indicator covering this question in the survey, 16 companies were eliminated from the sample.

Thirdly, participating enterprises were reviewed in relation to their size. As this study aims to research control consequences within SMEs, the European Union size limit of 250 employees was used to check the sample.[733] 20 enterprises were eliminated from the sample due to this restriction in size.

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729 Successful participation in this survey is defined as the completion of the subjective performance measurement construct.

730 Cf. Greve (2006), p. 116.

731 Cf. Haenlein (2004), p. 78; Roth/Switzer III (1995), p. 1010.

732 Cf. Schnell et al. (2005), p. 468.

733 For details on the definition of SMEs in this study refer to Chapter 2.1.2.

During the four steps a total number of 68 data sets have been eliminated which results in 295 remaining valid data sets. Hence, this study is able to build on a return rate of 9.2%.[734] Figure 15 summarizes the eliminations during the steps and illustrates the calculation of the return rate.

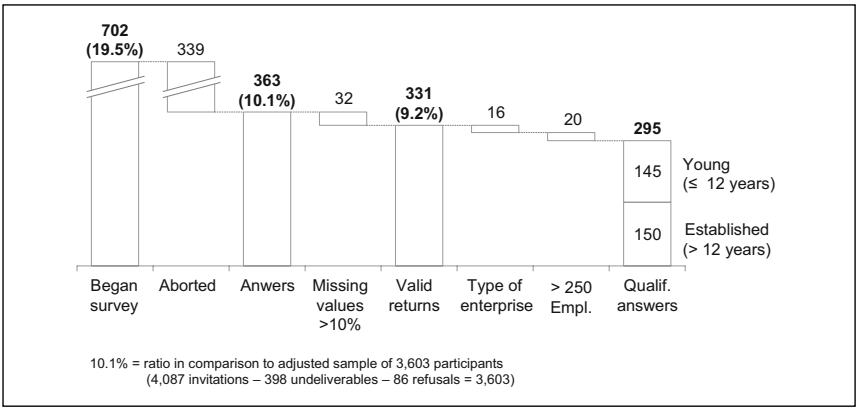

Figure 15: Overview of response rates[735]

6.2.2 Treatment of missing data

Most researchers are confronted with the problem of missing values.[736] The problem is especially relevant for researchers "conducting field research, where it is difficult to get individuals to answer all survey items."[737] As discussed in Chapter 6.2.1, 32 surveys were eliminated due to more than 10% missing values of the independent and more than 30% missing values of the dependent variables. Although the most common approach to deal with missing values is to simply ignore them,[738] this study chose to specifically address them. The choice not to disregard the missing values is contingent upon the usage of structural equation modeling, as SEM requires a data set without missing values or with specially marked missing values. To address this need for action, different techniques to deal with missing values are reviewed, one technique is selected and the required analysis is conducted.

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734 The return rate is calculated using the relevant sample and the number of valid answers: 295 / (4098 – 398 – 86) = 9.2%; Cf. Hanks/Chandler (1994), p. 29.
735 Own illustration.
736 Cf. Roth/Switzer III (1995), p. 1003.
737 Roth/Switzer III (1995), p. 1003.
738 Cf. Decker et al. (2000), p. 91.

Theory offers three distinct ways to deal with missing data: deletion of data sets, imputation techniques and parametric estimations. The three possibilities are visualized in Figure 16.

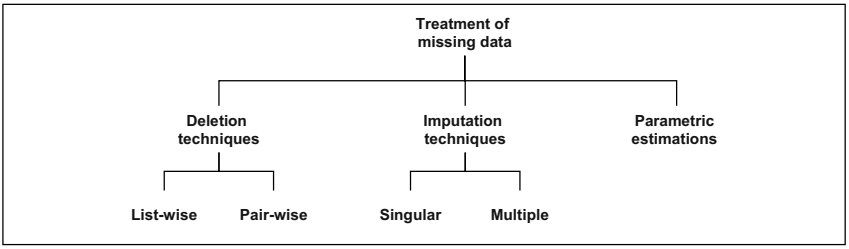

Figure 16: Treatment of missing data[739]

Deletion techniques select data sets and exclude them from further analysis. List-wise deletion eliminates the full data set if there is any missing value required by an analysis.[740] For example, if a researcher collected data on management practices in SMEs and only one moderating value (e.g. the marketing spending) is missing, the full data set would be excluded from further analysis. Consequently, list-wise deletion eliminates a significant amount of data. In contrast, pair-wise deletion distinguishes the elimination on an analysis by analysis rule.[741] In case pair-wise deletion would be applied to the previous example, the data set could be included in the general analysis. However, it would be excluded from the specific analysis on marketing spendings. Pair-wise deletion tends to preserve more data than list-wise deletion; nevertheless it still eliminates significant amount of information.

Second, *imputation techniques* replace missing values based on a predefined mathematical model. Singular imputation techniques use average values or linear regression models to estimate potential values.[742] Multiple imputations techniques utilize Monte-Carlo simulations to derive an array of potential values and pool the potential values to one single value.[743]
Finally, *parametric estimation* techniques use observed values that "provide indirect evidence about the likely values of the unobserved ones."[744] By doing so, these techniques utilize information about all data sets and the environment of the missing data. A pattern recognition algorithm is the basis for a probability model that utilizes maximum-likelihood or Bayes-algorithms[745] to estimate the most appropriate replacement value. The Expectation-Maximi-

739 Cf. Bankhofer (1995), p. 89.
740 Cf. Roth/Switzer III (1995), p. 1004.
741 Cf. Bankhofer (1995), pp. 91-94; Allison (2001), pp. 6-8.
742 Cf. Allison (2001), pp. 6-9; Bankhofer (1995), pp. 91-102.
743 Cf. Bankhofer (1995), pp. 104-106; Allison (2001), pp. 11-15.
744 Schafer/Olsen (1998), p. 546.
745 Cf. Bankhofer (1995), pp. 156-160.

zation (EM) model is the predominant model used in the literature for parametric estimations.[746]

The selection of a technique should be based upon two factors. First, the amount of bias induced by the technique should be minimal. Both the listwise and the pairwise deletion method reduce a large number of data sets for each statistical analysis and thus lower statistical power.[747] Consequently, they are not considered further in this study. According to PETERS/ENDERS (2002), single imputation "underestimates the variance of the variable and thus the covariance with other variables."[748] Both multiple imputations and parametric estimations have a limited bias effect on the underlying data and are, therefore, taken further into account for this study.[749] The second criterion is the effort required to perform the replacement algorithm. Multiple imputation algorithms have recently been implemented in specialized software packages but are still lacking a time efficient user interface.[750] Since the EM-algorithm is already included in the statistical software package SPSS, it is chosen to replace the missing values in this study.

Prior to the application of the EM-algorithm, the distribution assumptions need to be evaluated. Three different distributions of missing values can be distinguished: in case the values are missing at a random pattern and the absence of the value is not determined by other variables, the pattern is referred to as 'missing at random' (MAR). In case missing values do not relate to either other variables or existing values of the same variable, the literature considers this pattern 'missing completely at random' (MCAR). Missing values are considered to be 'missing not at random' (MNAR) if the absence of certain values can be explained by other variables or patterns in the existing data.[751] The EM algorithm requires the existence of MAR.

As the consequences of a deviation from the distribution assumptions are rather small and the statistical confirmation of one distribution rather complex, this study chose to employ the EM-algorithm without further testing.[752]

This study used the EM algorithm, provided by the statistical software SPSS, to replace missing values in the sample data. In total, the software replaced 26 missing values.

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746 Cf. Decker et al. (2000), p. 93.
747 Cf. Peters/Enders (2002), p. 81.
748 Peters/Enders (2002), p. 81.
749 Cf. Schafer/Graham (2002), p. 173.
750 For example, WinMICE, ICE or Missing Data Library. Most of the packages are designed as a plug-in for other statistical programs or platforms such as S-Plus, STATA or R. For alternative software packages that cover the MI approach, please refer to www.multiple-imputations.com.
751 Cf. Allison (2001), pp. 3-4.
752 Cf. Collins et al. (2001), pp. 332-334.

Subsequent to applying the EM algorithm, the data was rounded to zero-digit values between 1 and 7 (due to the usage of a 7-point Likert scale), checked for rounding errors to 0 or 8 and corrected if necessary. All further analyses were hence conducted with a complete data set.[753]

6.2.3 Representativeness of sample

In order to draw findings about the population from the sample, it is necessary to determine if the sample represents the population in an appropriate way. This study tests representativeness by comparing the geographical distribution in Germany and the industry distribution. Other characteristics cannot be compared due to either lacking data or the population.

Figure 17 illustrates that the geographical distribution of the sample matches the distribution of the population. Companies from the postal code 5, however, are slightly overrepresented, while postal code 2 is, to some extent, underrepresented in the sample. A potential reason for the strong participation in the postal code 5 is the fact that the RWTH Aachen University is located within this postal code and the participants were attracted by the brand of the university. Companies from the postal code 2 are assumed to suffer from the manual selection process of data sets, potential due to an overrepresentation of non-innovative companies from northern Germany, where other non-innovative industries remain dominant. The remaining 8 postal codes do not show any significant deviations between the two groups.

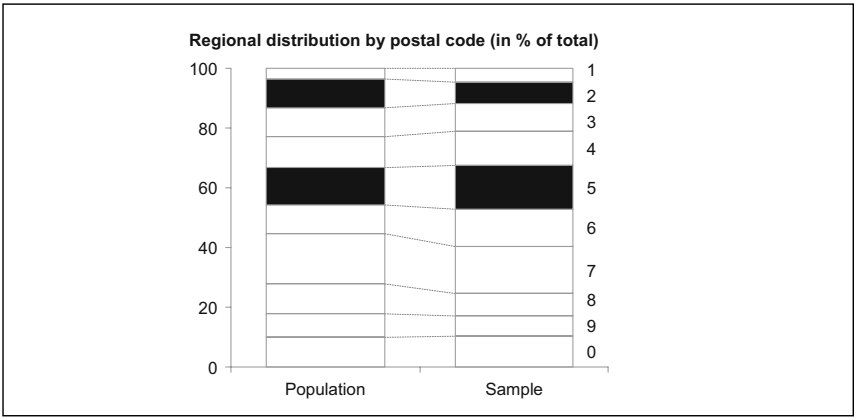

Figure 17: Distribution of responding companies by postal code[754]

[753] The replacement procedure was used for all indicators ranging from 1 to 7. Hence, additional information such as life cycle stage, company age or size were not replaced by the EM-algorithm.

[754] Own illustration.

The distribution of industries is illustrated in Figure 18 and shows that the distribution within the sample is, in general, comparable to the population. Nevertheless, companies of the industry codes 70 (IT and consulting companies) have responded over-proportionally to the survey. A potential reason is an increased interest in the research topic by their human resources. This deviation, however, is in line with other researches that found that IT and consulting companies respond slightly stronger than the average SME.[755] Engineering SMEs (industry code 20) are slightly underrepresented in the sample, potentially due to the data cleaning process, where a significant number of misclassified SMEs were dropped from this sector.

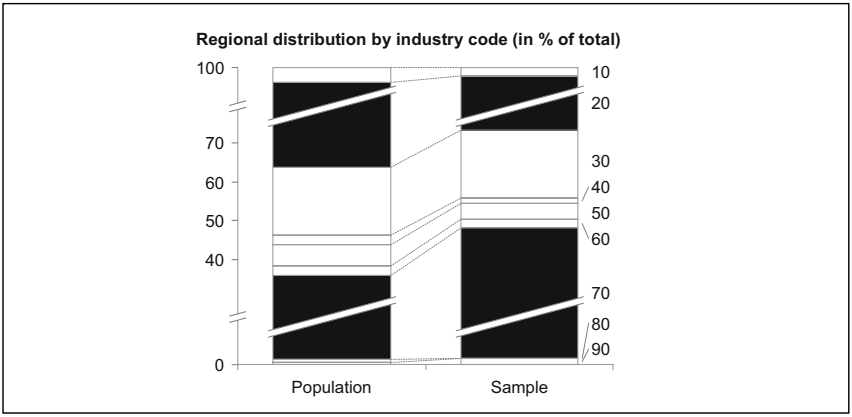

Figure 18: Distribution of responding companies by industry affiliation code[756]

Following the proposal of LAATZ (1993) that minor deviations between the characteristics of population and sample are acceptable,[757] the study concludes that the sample is representative of the underlying population and can be used for further analysis.

6.2.4 Analysis of biases

Data from respondents are subject to potential biases; values from the sample, however, must not deviate from the 'true' values of the population.[758] To ensure generalizability, this study considers three relevant forms of biases:

[755] Cf. Müller (2008), p. 145.
[756] Own illustration.
[757] Laatz (1993), p. 451.
[758] Cf. Dillman (1991), p. 227; Krosnick (1999), p. 539.

A *non-response bias* refers to the problem that "persons who respond differ substantially from those who do not."[759] The results of the research then "do not directly allow one to say how the entire sample would have responded."[760] Basically, there are three alternatives to test for non-response bias. First, if results of similar surveys are available, it is possible to compare the results with known values. This alternative does not apply to this study, as no previous studies are available that cover the research topic and the specified population of SMEs.[761] Secondly, researchers propose to use subjective estimates of the non-response bias. Unfortunately, it is "not clear how one should obtain these subjective estimates of bias."[762] Proposals like the use of socio-demographic data cannot be applied to this research, as the characteristics of owner/managers of SMEs are widely spread throughout the whole population. Finally, the extrapolation method assumes that late respondents answer like non-responders.[763] Since the comparison with known values and the use of subjective estimates are not feasible for this study, the data set was tested for significant differences between early-respondents and late-respondents. The data was split up into three groups based on whether the respondents answered to the initial invitation e-mail, or the first or second reminder. Then, the means of the indicators of the first and third group were compared against each other using a two-sided t-test. Three out of 70 variables showed significant differences, indicating that this study's sample is not affected by a substantial non-response bias.

The *informant bias* describes deviations of observations due to a different perception of the individual in comparison to the actual situation.[764] Key reasons for an informant bias are varying individual perception of the reality by different roles, management levels and corporate functions.[765] As this study specifically addresses managing directors and CEOs, deviations from different functional perspectives can thus be neglected. In line with other researchers, this study, hence, does not employ a formal testing of the informant bias.[766]

The *common method bias* describes the measurement error that relates to the method of data collection rather than to the measurement error of the constructs themselves.[767] Different reasons for common method bias can be distinguished.[768] As this study chose the CEO as the key informant, the key problem for this study is a potential single-source bias. It describes the measurement error if both the independent and dependent variables are evaluated by the same

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759 Armstrong/Overton (1977), p. 396.
760 Armstrong/Overton (1977), p. 396.
761 Refer to the introduction in Chapter 1.3 for the motivation of this study.
762 Armstrong/Overton (1977), p. 397.
763 Cf. Armstrong/Overton (1977), pp. 397-341.
764 Cf. Bagozzi et al. (1991), pp. 423-425.
765 Cf. Ernst (2003), p. 1267.
766 Cf. Hiddemann (2007), p. 92; Müller (2008), p. 139; Voll (2008), p. 119.
767 Cf. Malhotra et al. (2006), p. 1865; Podsakoff et al. (2003), p. 879; Reinartz et al. (2004), p. 301.
768 For a broad overview on the problem see Podsakoff et al. (2003), p. 882

person. Being biased by this behavior, the respondent tends to (unconsciously) influence his rating of the questions accordingly. Potential reasons for the deviation are (i) the desire to act consistent in their replies, (ii) implicit theories that the rater assumes to be valid or (iii) the wish for social acceptance or by the researcher.[769] The most widely used technique to address the issue of common method variance is the Harman's single-factor test.[770] The test bases on the assumption that there is "a substantial amount of common method variance . . . present."[771] To test for a single factor, an exploratory factor analysis is conducted. In case a common method bias is present in the data, it will emerge either by a single factor with an eigenvalue larger than 1 or one factor will account for the majority of the covariance among the measures. The use of the Harman's single-factor test reveals that the data can be reduced to 16 factors and a single factor accounts only for 25.2% of the overall covariance. Hence, this study concludes that there is no bias present in this study.

As all three bias tests yielded no structural deviations, the data can be used for further analysis without any limitations.

6.2.5 Description of data sample

After a first overview on the respondents of the survey in the context of the representativeness tests, the following chapter further describes the sample.

The companies will be described by their age, revenues, employees and life cycle stages in the following figures. The distribution of companies across different age classes is shown in Figure 19. Half (50%) of the companies are below the age of 13 years.

[769] The reasons for the single source bias have been extensively researched in the past: see, for example, Heider (1958); Berman/Kenny (1976); Crowne/Marlowe (1964).
[770] Cf. Iverson/Maguire (2000).
[771] Podsakoff et al. (2003), p. 889.

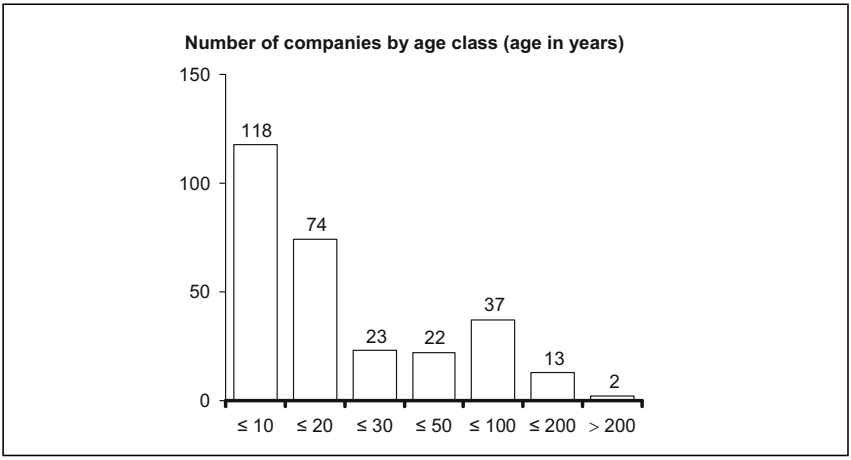

Figure 19: Distribution of responding companies by company age[772]

Figure 20 presents the number of companies by revenue class. The majority of the companies gather revenues of below € 5 Mio per year. This also corresponds to the definition of SMEs for this study.

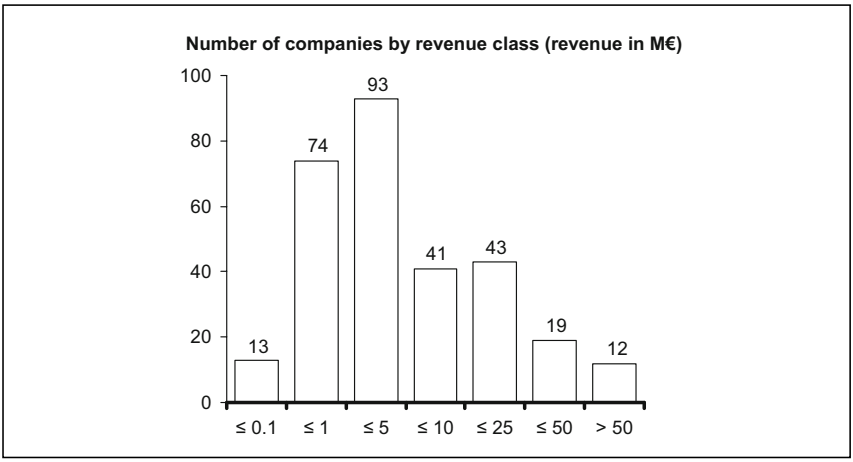

Figure 20: Distribution of responding companies by revenue class[773]

772 Own illustration.
773 Own illustration.

Figure 21 illustrates the number of companies sorted by the overall number of employees. The average size of a participating company is 60 employees, while the median number of employees is 18.

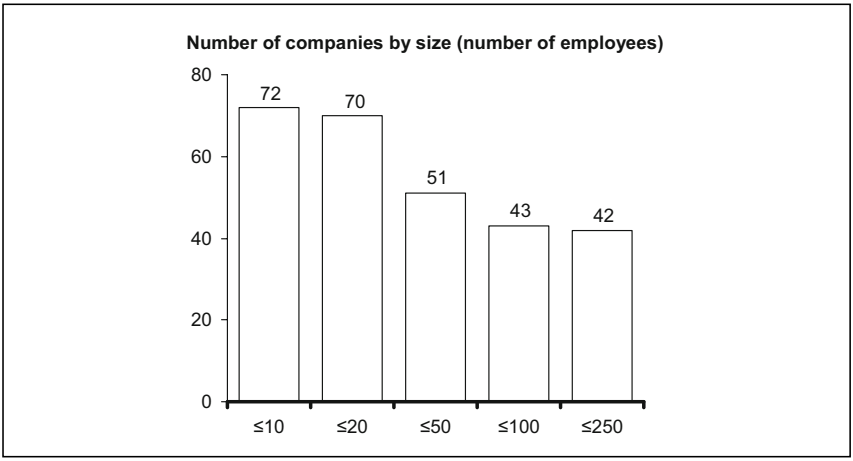

Figure 21: Distribution of responding companies by company size class[774]

6.3 Determination of required significance level

As this study draws upon a sample from the overall population of SMEs, inference testing is required to draw any conclusions from the data. Statistical tests typically posit a null hypothesis of no relationship between two variables of interest. With the help of a statistical test, the researcher intends to reject the null hypothesis.

The decision whether a relationship in fact exists, is associated with an error. Two errors can be distinguished during this decision-making process.[775] First, error type I occurs, in the case of a false rejection of a null-hypothesis, "that is, of finding an effect or relationship where none exists. The risk associated with committing type I errors is represented by α, the significance criterion."[776] Second, type II error is associated with the probability of incorrectly accepting a false null-hypothesis, "that is, of failing to detect an effect or relationship when one exists. The risk associated with committing type II errors is represented by β."[777] The concept of statistical power is directly associated with β. Statistical power represents the

[774] Own illustration.
[775] Cf. Mazen et al. (1987b), p. 403.
[776] Baroudi/Orlikowski (1989), p. 88.
[777] Baroudi/Orlikowski (1989), p. 88.

probability that a null hypothesis will be rejected for a given effect size[778] or that a statistical error is recognized if it is contained in the data.[779] Figure 22 visualizes the potential scenarios and their interdependencies.

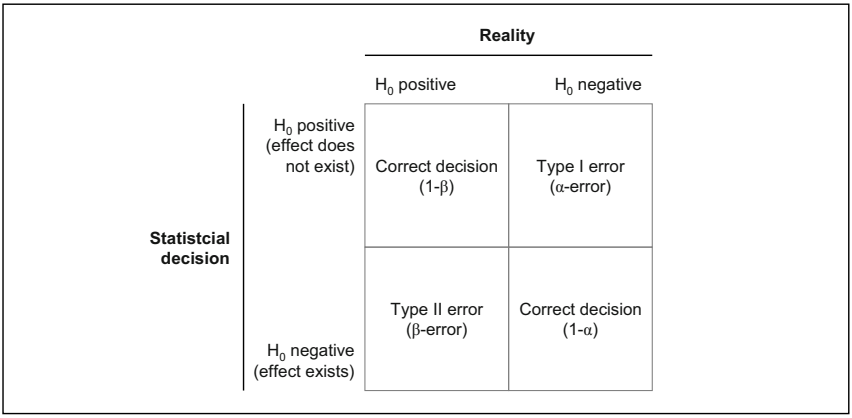

Figure 22: Inference testing and associated errors[780]

Typically, "textbooks on classical statistics, for instance, indicate that the alpha error is generally and arbitrarily set at 5 or 1 per cent in hypothesis testing."[781] These values for the probability have become a standard across and are being used by a large number of researchers. However, CASCIO/ZEDECK (1983) show that there are situations where signify-cantly higher α values are acceptable and necessary.[782] MYERS/MELCHER (1969) even propose α values up to 40%, depending on the research goal.[783] Although these values have received strong attention from authors and reviewers, the possibility of type II errors is frequently ignored in the management literature.[784]

The traditional assumption is that "the consequences of false positive claims are more serious than those of false negative claims."[785] However, the balance between type I and type II errors needs to be appropriate for the situation.[786] In addition, neglecting a type II might result in the

778 Cf. Boyd et al. (2005) p. 240.
779 Cf. Hair et al. (1998), p. 11.
780 Own illustration building on Baroudi/Orlikowski (1989), p. 88.
781 Myers/Melcher (1969), p. B31.
782 Cf. Cascio/Zedeck (1983) pp. 523-524.
783 Cf. Myers/Melcher (1969), p. B35.
784 Cf. Boyd et al. (2005), p. 242.
785 Cohen (1965), p. 370.
786 Cf. Mazen et al. (1987a) show that type II errors can also have significant costs associated with them. For instance, prior to the flight, decision makers at NASA faced the choice between two

deletion of avenues for promising research as an actually existing relationship might not be discovered. Especially in a young research area such as MCS in SMEs, this risk should be avoided.[787] Consequently, this study applies the concept of statistical power and includes adequate levels for α and β errors in its analysis.

The required level for significance can be calculated with the statistical power analysis.[788] It "exploits the relationships among the four variables involved in statistical inference: sample size (n), significance criterion (α), population effect size (f) and statistical power."[789] Each value can be determined by the other three. This dependency is illustrated in the figure below.

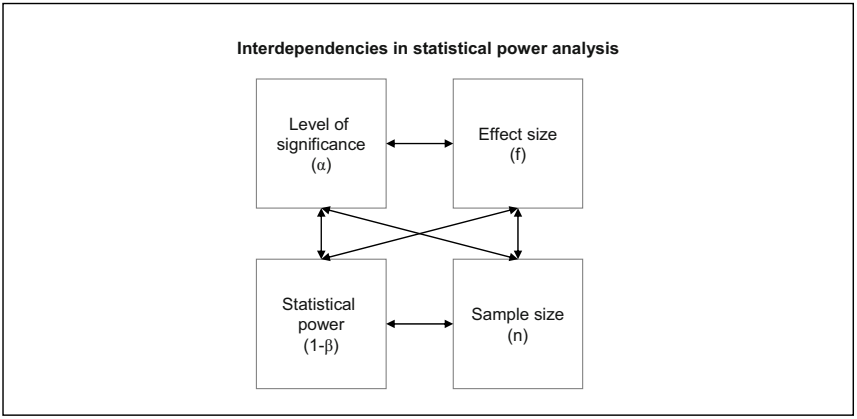

Figure 23: Factors influencing statistical power analysis[790]

As the significance level α has already been explained, the other values of the calculation are now presented further. The statistical power (1-β) is defined as the probability to "correctly reject a false null hypothesis"[791] (or otherwise to discover a phenomenon that exists). Cohen's proposal of a 0.80 level for sufficient statistical power has become widely accepted[792] and offers "advantages in interpretation of results."[793]

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assumptions: first, the shuttle was unsafe to fly due to the low performance of the O-ring in comparison to prior missions; second, the shuttle was able to fly, because there was no performance difference of the O-ring. In case the shuttle had been functional, but would not have been used, a type I error might have occurred. Obviously, the type II error costs far outweight the costs of type I error.

787 Cf. Baroudi/Orlikowski (1989), p. 97.
788 Cf. Cohen (1992), p. 156.
789 Cohen (1992), p. 156.
790 Own illustration building on Cohen (1992), p. 156.
791 Baroudi/Orlikowski (1989), p. 88.
792 Cf. Cohen (1992), p. 56.
793 Baroudi/Orlikowski (1989), p. 89.

The effect size (f) "represents the magnitude of a phenomenon in a population. If else is constant, the larger the effect size, the greater the degree to which a phenomenon manifests itself and the greater the probability it will be detected and the null hypothesis rejected."[794] It is in general distinguished into small, medium and large effect sizes.[795] This study investigates the effects of specific management techniques on the company performance of SMEs. Despite control's relevance for an organizatios, the absolute effect size is expected to be rather small to medium than a large size. Therefore, the effect size (f) is set to 0.17 as the medium between small (0.10) and medium (0.25) effect sizes.[796] The sample size (n) of this study is 295 respondents. In order to equal the relevance of α and β errors, the α/β ratio will be set to 1.[797]

To calculate the statistical power and to derive the respective significance levels, this study uses the software package GPOWER 3.0 which was developed by ERDFELDER ET AL. in 2007.[798] Assuming an effect size (f) of 0.17, an α/β ratio of 1 and 295 observations (n), the statistical power is calculated to 92.7% (one-sided test) and 89.9% for the two-sided test. The respective critical t-values are 1.4612 (α significance level of 7.3%, one-sided) and 1.6439 (α significance level of 10.1% for two-sided tests). Therefore, if an empirical effect is larger than the theoretical t-values mentioned above, this study can conclude that existing effects are detected with a probability of at least 90%. In order to conclude statements not only based on absolute significance (minimum t-value of 1.4612 and 1.6439 as calculated above) but also on the traditional levels of significance, this study also includes higher significance levels such as 10%, 5% and 1%. The minimum t-values are computed with the software GPOWER 3.0 as well and are summarized in Table 11 for both one and two-tailed tests.

Significance levels used in this study

One tail		Two tailed	
α-value	t-value	α-value	t-value
0,1000	1,2844	0,1013	1,6439
0,0725	1,4612	0,1000	1,6501
0,0500	1,6501	0,0500	1,9681
0,0100	2,3391	0,0100	2,5927

Table 11: Required significance levels[799]

794 Mazen et al. (1987a), p. 370.
795 Cf. Cohen (1992), p. 157.
796 Cf. Baroudi/Orlikowski (1989), p. 90.
797 Cf. Erdfelder (1984), p. 27.
798 The software package (version 3.0.8) is available for free and can be downloaded from the authors' website http://www.psychologie.uni-mannheim.de/ psycho3/softwa.htm (November 18, 2008).
799 Own illustration.

7 Empirical results

Prior to formal hypotheses testing, the measurement models are assessed to ensure validity and reliability (Chapter 7.1.1). Only if the measurement models show satisfying levels of validity and reliability, can the interdependencies between the latent variables be used for interpretation. Subsequent to the analysis of the measurement model, the structural model is evaluated in Chapter 7.1.2. Then, complementing the effects of individual forms of control, control combinations are evaluated in Chapter 7.2. Finally, potential moderators of the control-performance relationship are discussed and analyzed with regard to their influence on management controls in Chapter 7.3.

7.1 Main model

After evaluating the overall data set in respect to the generalizability of the data, the next step of the model analysis is the assessment of the measurement models. Although the constructs have previously been used in research, they were only applied in large, established organizations. In relation to this fact, HOMBURG (2006) states that the detailed assessment of a measurement model, which has previously not been used in that research setting, is one of the key contributions of a causal analysis.[800]

7.1.1 Measurement model

Initially, the adequacy of the scale ranges used in the study is evaluated. Table 12 provides an overview on the constructs used in the study, their average scale, standard deviations and the scale ranges used by the respondents.

Descriptive Analysis of data set (constructs)					
	No. of indicators	Mean	Standard deviation	Minimum	Maximum
Results control (RC)	5	4.90	1.77	1	7
Behavior control (BC)	4	4.86	1.54	1	7
Personnel control (PC)	5	5.03	1.57	1	7
Cultural control (CC)	5	5.68	1.13	1	7
Performance (PERF)	7	4.89	1.32	1	7

Table 12: Descriptive analysis of constructs[801]

All scales show satisfying levels of differentiation and the ranges of the indicators have been used to their full extent by the respondents. The cultural control scale, however, is characterized by a relatively high arithmetic mean and slightly smaller standard deviation in

[800] Cf. Homburg (2000), pp. 68-71.
[801] Own illustration.

comparison to the other constructs. The descriptive analysis of all indicators can be found in Appendix F, Table 29.

The measurement of a variable is almost entirely associated with a measurement error. To estimate the effects of these errors on the measurement, the measurement model is evaluated with regard to a systematic and a random error.[802] The *reliability* of a measurement refers to random errors associated with the measurement of the variable. Given the true level of an external value, a fully reliable measurement model consistently measures exactly one value for this variable. However, this value is not necessarily identical with the true level. A measurement model with high *validity* shows no difference between the true level and the measurement level of a variable. Validity can, hence, also be understood as the elimination of any systematic error during the measurement.

The evaluation criteria for reflective and formative constructs differ from each other, since the evaluation criteria for reflective constructs are based on the assumption that the indicators correlate highly among each other. This assumption is not necessarily applicable to formative measurement models as well. Consequently, the qualities of the reflective and formative measurement models are evaluated separately in the next two chapters.

7.1.1.1 Reflective measurement models

Reflective measurement models can be evaluated both on their indicator and construct levels.

7.1.1.1.1 Assessment of reliability

Indicator reliability measures the variance of the indicators which can be explained by the variance of the underlying latent construct and not by the measurement error. Academics propose that at least 50% of the indicator variance should be explained by the variance of the underlying latent construct; this translates into a minimum factor loading of 0.7.[803] In relation to the state of research, other researchers propose to use lower factor loadings: HOMBURG/BAUMGARTNER (1995) propose to eliminate indicators with a factor loading of less than 0.4,[804] while CHIN argues that factor loadings of 0.5 are still sufficient in the context of scale development.[805] As this study utilizes pre-existent constructs from the literature that have not yet been used in the context of SMEs, it takes a hybrid perspective on indicator reliability. The scale was not developed in this study; nor has it been used in the SME

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802 Cf. Homburg/Hildebrandt (1998), pp. 24-25; Götz/Liehr-Gobbers (2004a), p. 727.
803 Cf. Götz/Liehr-Gobbers (2004a), p. 727. The minimum factor loading is calculated as the square root of the share of variance explained by the latent construct.
804 Cf. Homburg/Baumgartner (1995), p. 170.
805 Cf. Chin (1998b), p. 325.

research yet. Therefore, the study uses a minimum factor loading of 0.5 for indicators to ensure indicator reliability.[806] Consequently, all indicators with a factor loading of less than 0.5 are eliminated and will not be considered in the models of this study.

Construct reliability determines the consistency of the measurement amongst the indicators. Previous research proposes three criteria for the assessment of construct reliability: Cronbach's alpha (CA), internal consistency (IC), and average variance extracted (AVE).[807] Cronbach's alpha is defined as the weighted average of all correlations between indicators. This study employs the broadly accepted threshold value of 0.7 for Cronbach's alpha.[808] Internal consistency builds upon the concept of Cronbach's alpha, but allows individual weighting by indicator and, therefore, is expected to be even more accurate.[809] Values for internal consistency are expected to reach the level of 0.7 as well, primarily due to the conceptual proximity to Cronbach's alpha.[810] Finally, average variance extracted (AVE) describes the share of variance of the construct explained by the indicators and not by the measurement error. Literature suggests minimum levels of 0.5,[811] 0.6[812] or 0.7.[813] Due to the new research environment for the constructs and consistent with the decision in relation to indicator reliability, this study uses a threshold of 0.5 for AVE.

Reliability measures for the construct of behavior control are summarized in Table 13.

Construct	Behavioral control (BC)		
Specification	Reflective		
Cronbachs Alpha	0.799		
Internal consistency	0.876		
AVE	0.702		
Indicator-No.	**Indicator-Text**	**Loading**	**T-Value**
BC01	My employees discuss the necessary work steps for achieving their targets with me.	0.794	7.139
BC02	If targeted results are not achieved, my employees discuss the next relevant steps with me.	0.839	8.692
BC03	During projects, my employees always know where they stand in respect to their target achievement.	0.879	15.509
BC04	My employees and me define the most important work steps for routine tasks.	eliminated	

Table 13: Indicator and construct reliability for "Behavior control"[814]

806 Müller (2008), p. 155.
807 Cf. Meier (2006), p. 92.
808 Cf. Cronbach (1951), pp. 297-299; Werts et al. (1974), pp. 25-27.
809 Cf. Homburg/Giering (1996), p. 120.
810 Cf. Hulland (1999), p. 199; Götz/Liehr-Gobbers (2004a), p. 728.
811 Cf. Fornell/Larcker (1981), p. 46; Chin (1998b), p. 321.
812 Cf. Herrmann et al. (2006), p. 61.
813 Cf. Voll (2008), p. 130.
814 Own illustration.

The fourth indicator (BC4) of the construct behavior control was eliminated due to a factor loading below the threshold of 0.5. However, the consistency indicators for the remaining items show sufficient construct reliability.

Although consisting of four indicators, the construct of behavior control was reduced by the indicator BC4. As the measurement models were developed with rigor and previously showed sufficient consistency in loadings, such elimination requires discussion: the indicator BC4 refers to the definition of required process steps adopted by the manager. In contrast to BC4, the indicator BC1 refers to the general discussion of process steps with the superior manager (rather triggered by the employee). One might speculate that the top-down definition of targets is a consequence of the working culture in SMEs. The liability of informality and a rather informal working culture potentially prevents a section of the SME managers from defining the process steps for their employees. As the remaining part of SME managers can be expected to continue to conduct this activity, the standard deviation of the indicator is likely to increase. This, in turn, is expected to result in a decrease of the loading, which ultimately results in the elimination of the indicator. The managers of larger organizations, in turn, with their stronger focus on hierarchies and standard processes, are expected to preferably define the required process steps.

Construct	Cultural control (CC)		
Specification	Reflective		
Cronbachs Alpha	0.915		
Internal consistency	0.935		
AVE	0.743		
Indicator-No.	**Indicator-Text**	**Loading**	**T-Value**
CC01	Our employees are ready to work more than expected for contributing to our company's success.	0.844	31.094
CC02	Our employees are very loyal to our company.	0.891	31.500
CC03	There is a high congruence of our company's values and the individual values of our employees.	0.902	66.526
CC04	Our company's destiny is very important to our employees.	0.814	20.354
CC05	Our employees tell their friends, that our company is a good employer.	0.855	39.114

Table 14: Indicator and construct reliability for "Cultural control"[815]

All indicators of the construct of cultural control show satisfying loadings; hence no indicator was eliminated. Cronbach's alpha, internal consistency and AVE are well above the defined threshold of 0.7 (CA & IC) and 0.5 (AVE). In short, a high level of reliability can be assumed for this construct.

[815] Own illustration.

7.1.1.1.2 Assessment of validity

In relation to the systematic error *(validity)* of the measurement model, content, discriminant and nomological validity can be distinguished. *Content validity* of a reflective measurement model can be assumed, if the indicators reflect the semantic field of the overall theoretical construct– in other words, if the indicators really measure the concept they should. However, the congruence of the indicators with the theoretical concept cannot be determined by a statistical test, but should rather build on conceptual considerations. A high level of content validity can be ensured by an extensive literature review of measurement models and by discussions with both academic and management experts.[816] As outlined in Chapter 5.2, the measurement models were selected based on a broad literature review and were discussed with experts prior to the comencement of the survey. Minor adjustments to the indicators were made to increase the intelligibility to the managers. As a consequence of this procedure, the content validity of the reflective measures is expected to be at a sufficient level.[817]

Discriminant validity describes the degree to which the indicators of a construct measure exactly the associated construct and not any other. HULLAND (1999) explains that it "represents the extent to which measures of a given construct differ from measures of other constructs in the same model."[818] Discriminant validity can be measured both on the construct and on the indicator level. On the indicator level, discriminant validity requires indicators to correlate most with their respective constructs. Hence, no indicator is permitted to correlate more with another construct than its associated construct.[819] Discriminant validity on the construct level determines significant semantic differences between the constructs. Constructs are expected to measure conceptually different concepts and not identical ones.[820] To determine this, researchers use the criterion of FORNELL-LARCKER that requires the construct's AVE square root to be larger than the correlation of this variable with all other constructs in the model.[821]

To test for discriminant validity on the indicator level, Table 15 summarizes the correlations of all indicators and constructs. As the indicator BC4 was previously eliminated due to a low loading, the table only contains indicator correlations of reflective constructs remaining in the measurement model.

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816 Cf. Engelen (2008), p. 201.
817 This approach is as well in line with the methods adopted by other researchers such as Rossiter (2002), p. 308.
818 Hulland (1999), p. 199.
819 Cf. Chin (1998b), p. 325.
820 Cf. Fornell/Larcker (1981), p. 46.
821 Cf. Fornell/Larcker (1981), p. 46.

Discriminant validity on indicator level					
	RC	**BC**	**PC**	**CC**	**PERF**
BC1	0.384	**0.794**	0.229	0.377	0.135
BC2	0.387	**0.839**	0.305	0.379	0.122
BC3	0.490	**0.879**	0.364	0.338	0.221
CC1	0.224	0.399	0.356	**0.844**	0.244
CC2	0.231	0.430	0.304	**0.891**	0.242
CC3	0.262	0.434	0.402	**0.902**	0.338
CC4	0.161	0.286	0.264	**0.814**	0.182
CC5	0.212	0.285	0.366	**0.855**	0.351

Table 15: Discriminant validity on indicator level[822]

The analysis of discriminant validity on the construct level is summarized in Table 16. It encompasses all correlations between the constructs and the square root of the constructs' AVEs on the principal diagonal of the matrix. In the case of a formative construct, as an AVE does not exist, it is referred to as not applicable (n.a.).

Discriminant validity on construct level					
	RC	**BC**	**PC**	**CC**	**PERF**
RC	n.a.				
BC	0.514	**0.838**			
PC	0.444	0.368	n.a.		
CC	0.258	0.426	0.403	**0.862**	
PERF	0.209	0.203	0.357	0.331	n.a.

Table 16: Discriminant analysis on construct level[823]

As regards the discriminant validity, the analysis shows that all reflective indicators correlate most with their associated overall construct. No correlation of any indicator with its associated construct is smaller than the correlation of the indicator to any other construct. Additionaly, the analysis in Table 16 shows that the FORNELL-LARCKER criterion for discriminant validity on the construct level is met for all reflective constructs. Hence, all reflective constructs are expected to show a sufficient level of discriminant validity and are hence used further in this study.

The criterion of *nomological validity* relates to the causal relationship among the indicators, the constructs and their integration into a comprehensive framework.[824] In the case of a causal analysis, the structural model represents this comprehensive framework. The sufficient

[822] Own illustration.
[823] Own illustration.
[824] Cf. Peter/Churchill (1986), pp. 1-2.

satisfaction of the structural model assessment criteria is a strong indication of the nomological validity of the constructs.[825] As Chapter 7.1.2 will show, the overall structural model reaches satisfying levels of assessment criteria; hence the reflective constructs are supposed to exhibit strong nomological validity.

To extend the assessment of measurement quality of the reflective constructs, this study chose to perform a confirmatory factor analysis (CFA).[826] In order to do so, isolated models of each reflective measurement model are evaluated in the software package AMOS/SPSS. Table 17 summarizes the results of the analysis. As evident from the table, the evaluation leads to very satisfactory results. Both reflective constructs show sufficient levels of stand alone (χ^2/df, RMSEA, GFI, AGFI) and fit indices (NFI, CFI).[827] Hence, the indicators are assumed to represent the constructs and to be distinct from others.

Confirmatory Factor Analysis (reflective constructs)			
	Requirement	**Behavior control**	**Cultural control**
χ^2/df	≤ 5	2.88	2.60
RMSEA	≤ 0.08	0.08	0.07
GFI	≥ 0.9	0.99	0.98
AGFI	≥ 0.9	0.95	0.95
NFI	≥ 0.9	0.98	0.99
CFI	≥ 0.9	0.99	0.99

Table 17: Quality assessment of reflective measures based on CFA[828]

825 Cf. Bagozzi (1981), pp. 195-197.

826 Cf. Homburg/Pflesser (2000a), p. 426.

827 For an introduction to the evaluation criteria refer also to Homburg/Pflesser (2000a), pp. 427-430: χ^2/df (chi square adjusted by degrees of freedom) – determines if the covariance matrix derived from the empirical data is different from the theoretically expected covariance matrix as in Homburg/Giering (1996), p. 13; RMSEA (root mean squared error of approximazation) assesses the goodness of the approximation of the model rather than its correctness as in Homburg/Pflesser (2000a), p. 427; GFI (goodness of fit index) assesses the goodness of the approximation of the model rather than its correctness as in Homburg/Giering (1996), p. 13; AGFI (adjusted goodness of fit index) also assess the goodness of the approximation, adjusted by the degrees of freedom, as in Homburg/Giering (2000), p. 83; NFI (normed fit index) compares χ^2 of the empirical model with the χ^2 statistics of the null model as in Homburg/Pflesser (2000a), p. 430; and CFI (comparative fit index) identical approach as the NFI but adjusted by the degrees of freedom as in Homburg/Pflesser (2000a), p. 430. For the determination of thresholds, refer to: χ^2/df: Balderjahn (1986), p. 109; for RMSEA: Homburg/Pflesser (2000a), p. 430; for GFI/AGFI: Homburg/Giering (1996), p. 13; for NFI/CFI: Homburg/Pflesser (2000a), p. 430.

828 Own illustration.

Based on the considerations of content, discriminant and nomological validity, the reflective measurement models of this study are assumed to possess high levels of validity.

7.1.1.2 Formative measurement models

Just like reflective constructs, formative constructs are evaluated based on reliability and validity criteria. However, due to the fact that indicators of formative measurement models do not necessarily correlate with each other, traditional construct assessment criteria, such as Cronbach's alpha or average variance explained (AVE) cannot be applied to formative constructs.[829]

7.1.1.2.1 Assessment of reliability

In order to test the reliability of formative constructs, this study uses the criteria of indicator reliability and multicollinearity. In order to determine *indicator reliability*, researchers identify the indicators that contribute most to the meaning of the overall construct. The relevant figures in this case are the indicator weights.[830] The higher the indicator's weight, the stronger it contributes to the overall construct. However, there is no accepted threshold for the elimination of an indicator based on its weight. At the same time, the elimination of an indicator would lead to a significant change of the semantic concept of the construct.[831] Hence, no indicators will be eliminated as a result of a low weight.

Second, *multicollinearity* is another relevant criterion for the evaluation of a formative measurement model. Multicollinearity refers to a configuration in which indicators can be represented by a linear combination of other indicators. As PLS uses linear regression techniques to estimate the weights within a formative measurement model, a key requirement is the absence of multicollinearity. An undesired consequence of multicollinearity is a potential miscalculation of the PLS algorithm resulting in decreased weight accuracy. The variance inflation factor (VIF) can be used as a criterion for multicollinearity assessment. The VIF determines the variance impact on the regressions coefficients caused by multicollinearity. A proven maximum level of VIF is 10.[832] Higher levels of VIF suggest a potential issue of multicollinearity; however, low levels of VIF do not prove its absence. To complement the VIF-value analysis, this study uses the condition index (CI). It "represents the collinearity of combinations of variables."[833] The higher the CI value, the higher the

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829 Cf. Götz/Liehr-Gobbers (2004a), p. 728; Fassott/Eggert (2005), pp. 38-29.
830 Cf. Chin (1998b), p. 307.
831 Cf. Fassott/Eggert (2005), p. 39.
832 Cf. Marquardt (1970), p. 606; Kennedy (1998), p. 190.
833 Hair et al. (2006), p. 226.

degree of collinearity amongst the indicators. CI values below 30 remain acceptable,[834] but above this level a split of the variance is required.[835]

The following tables contain indicator weights, significance levels, VIFs and the condition indices for all formative constructs.

All indicators of the construct "results control" show VIF-values between 1.448 and 2.509 that are well below the threshold of 10. In addition, the CI remains below the acceptable level of 30 as well. Hence, although the weights of three indicators were not significant, the overall construct of results control is assumed to show a sufficient level of reliability. The results are summarized in Table 18.

In line with the reflective measurement models, the three insignificant indicators require a short discussion: items RC02 and RC04 refer to goals of the organization, in particular, how they are enforced and caught up. One might speculate that management resources in SMEs are tight and, therefore, regular reviews of goals in SMEs are less frequent than in large organizations, where the construct has previously been used. The third indicator RC03 questions to what extent employees comment on their individual goal misachievements. A potential reason for this might be that frequent interaction and discussion of goal achievement actually do not occur in SMEs; rather the figures of goal and actuals are compared with another and incentives are paid without any additional in-depth discussion.

Construct	Results control (RC)			
Specification	Formative			
Condition index	14.171			
Indicator-No.	**Indicator Text**	**VIF**	**Weight**	**T-Value**
RC01	Each employee has individual goals.	2.035	0.457	1.836
RC02	Target achievements of my employees' goals are controlled by me.	2.314	0.010	0,042 (n.s.)
RC03	Employees have to comment if they do not meet their individual goals.	2.509	0.350	1.197 (n.s.)
RC04	My employees get feedback on their goal achievement when projects / tasks are accomplished.	1.991	-0.037	0,160 (n.s.)
RC05	Salary increases and bonus payments (or other compensation components) of our employees are linked to goal achievements.	1.448	0.426	1.689

Table 18: Reliability measures "Results control"[836]

[834] Cf. Mason/Perreault (1991), p. 270; Krafft et al. (2005), pp. 79-80; Hair et al. (2006), p. 226.
[835] Cf. Dördrechter (2007), pp. 242-245.
[836] Own illustration.

Table 19 summarizes the assessment of the personnel control construct. The VIF values and the condition index stay below their maximum acceptable values. Three of the five indicators do not show significant weights: indicator PC01 and PC02 refer to the techniques used to conduct personnel control. A potential reason for the low level of significance could be the absence of formal procedures and a rather low number of interviews conducted in SMEs. Indicator PC03 also shows a low level of significance. One might speculate that for SMEs it is not always possible to actually recruit the best-suited applicant. Due to the lower degree of SME employer-branding and potential higher job requirements of SMEs in regard to overall coordination skills, the "cherry-picking" of recruits could be assumed to be more difficult. However, as outlined above, no indicators will be eliminated due to the semantic integrity of the construct. Based on these findings, the personnel control construct is expected to have a sufficient reliability as well.

Construct	Personnel control (PC)			
Specification	Formative			
Condition index	18.958			
Indicator-No.	**Indicator Text**	**VIF**	**Weight**	**T-Value**
PC01	Applicants have to pass a number of interviews and evaluations before they are hired.	1.982	0.006	0,045 (n.s.)
PC02	Applicants have a number of opportunities to show the range of their skills.	1.670	-0.035	0,264 (n.s.)
PC03	We place emphasis on hiring the best-suited applicant for a particular job position.	1.533	0.106	0,756 (n.s.)
PC06	We regard training and development of talented employees as an important necessity.	1.461	0.661	3.865
PC07	We have put much effort into establishing a well-suited recruiting process for our company.	1.678	0.448	2.456

Table 19: Reliability measures "Personnel control"[837]

All seven indicators contributing to the construct of subjective company performance show both strong weights and significance levels. The maximum values of both VIF values and the condition index are not exceeded by the construct; hence it is assumed to show a satisfying level of reliability. Table 20 summarizes the findings.

[837] Own illustration.

Construct		Subjective company performance (PERF)			
Specification		Formative			
Condition index		24.675			
Indicator-No.	Indicator Text		VIF	Weight	T-Value
PERF01	Compared to our most important competitors we are … with the economic development of our company.		2.986	0.202	9.744
PERF02	Compared to our most important competitors we are … with the growth of our company.		3.062	0.184	9.274
PERF03	We are … with the profit forecast for the next years.		1.735	0.160	6.287
PERF04	Compared to our most important competitors we are … with the success of our products.		2.064	0.213	8.872
PERF05	Compared to our most important competitors we are … with the number of new customers.		1.713	0.170	6.978
PERF06	Compared to our most important competitors we are … with customer retention.		1.694	0.228	7.652
PERF07	Compared to our most important competitors we are … with our advancements in market share.		1.667	0.167	5.498

Table 20: Reliability measures "Subjective company performance"[838]

The three formative measurement models meet all the required threshold values. Based on these considerations, they can be used further in this study and are assumed to measure the latent variables with strong reliability.

7.1.1.2.2 Assessment of validity

Similar to reflective ones, formative measurement models can be evaluated in terms of their content and nomological validity. As outlined before, indicators of formative measurement models do not necessarily correlate with another; therefore, the criterion of *discriminant validity* does not apply to a formative measurement model.

The measurement models were taken from the literature and had been previously utilized in other research studies. In addition, the pre-test with academics and managers of SMEs revealed that they were well understood and had to be altered only to a minor extent. Therefore, an acceptable level of *content validity* can be assumed.

With regard to the *nomological validity*, the formative constructs are embedded in an overall control framework as well. As will be shown in the following chapter, the structural model shows a sufficient level of global quality assessment criteria; hence the *nomological validity* of the formative constructs can be taken for granted.

[838] Own illustration.

In line with the reflective measurement models, the formative constructs show satisfying levels of both reliability and validity. Consequently, the overall structural model can now be assessed with regard to its ability to determine the outcomes of management control in SMEs.

7.1.2 Structural model

Complementing the assessment of the measurement models, researchers also determine the quality of the overall structural model. Due to the less restrictive constraints of the PLS methodology, especially due to the lack of the normality assumption,[839] variance-based SEMs cannot be evaluated using inference based structural model testing.[840] Consequently, non-parametric tests are used to determine the overall quality of the structural model. Three criteria are used for the evaluation: the coefficient of determination (R^2), coefficient of prognostic relevance (Q^2) and the significance of the path coefficients.[841]

The *coefficient of determination* (R^2) reflects the amount of explained variance of an endogenous construct, which is explained by the exogenous variables. Similar to the R^2 in linear regression models, R^2 is calculated as the ratio of explained variance by the exogenous variables divided by the overall variance of the model.[842] R^2 takes on values between 0 and 1 and is frequently measured as a percentage. With regard to the assessment of the structural model, there is no commonly accepted threshold level. Rather, the coefficient should be evaluated in the light of the research model and the research objective.[843] In particular, an evaluation should take into consideration if the model seeks to explain the entire variance (full model) or aims at representing a partial aspect (partial model) influencing the endogenous variable.

The main model yielded a coefficient of determination (R^2) of 17.1%. Hence, 17% of the company performance variance can be explained by the means of management control. As outlined in Chapter 1, management control is expected to be one factor influencing internal resource allocation; thus the model is rather considered a partial model than a full model. The level of R^2 is also in line with other studies investigating performance effects of management control: BERTHELOT/MORRILL (2007), while investigating the interaction of control systems with strategy, were able to build a model with an R^2 of 20%.[844] Similarly, LIAO (2006) developed a model explaining the effect of HRM control techniques on financial performance

839 Cf. Hulland (1999), p. 202.
840 Cf. Götz/Liehr-Gobbers (2004a), p. 730.
841 Cf. Chin (1998b), p. 316.
842 Cf. Götz/Liehr-Gobbers (2004a), p. 730.
843 Cf. for example Backhaus et al. (2006), p. 96.
844 Cf. Berthelot/Morrill (2007), p. 14.

with an R^2 of 26%.[845] Finally, HIDDEMANN's (2007) model of operational management in young firms was able to determine 24% of performance variance.[846]

As mentioned above, the structural model is expected to be a partial model, as management control is only one factor contributing to the overall success of an SME. Building on this assumption and considering that the R^2 is in line with previous research, the coefficient of determination of the overall model is assumed to be sufficient to derive further insights from it.

The second measure to assess the quality of the overall model is the *coefficient of prognostic relevance* (Q^2). Q^2, also referred to as the Stone-Geisser criterion,[847] measures the predictive quality of the model. After omitting a defined part of the data ("blindfolding"), the software reconstructs the omitted endogenous part with the use of the remaining model (exogenous variables).[848] The potential values of Q^2 range from -1 to a maximum of +1. Positive values of Q^2 indicate an adequate predictive quality of the exogenous variables, while a value below 0 does not allow any conclusions on the model's predictive quality.[849] The basic model shows a prognostic relevance of 8.7%. As it is positive, a sufficient predictive relevance can be concluded.

Finally, researchers evaluate the *significance of the path coefficients* to determine the directions and strengths of the relationships of the model. In terms of their absolute value of the relationship between different constructs, CHIN considers path coefficients larger than 0.2 as "strong."[850] Path coefficient's significances are calculated using empirical t-values from resampling techniques ("bootstrapping") and comparing them with theoretical t-values.[851] As discussed in Chapter 6.3, this study uses statistical power analysis in order to detect existing relationships, while balancing the risks of α- and β-errors. For the full sample of n=295 companies, this results in a significance level of 0.07. In addition, "traditional" significance levels of 0.1, 0.05 and 0.01 are used in the analysis as well. Figure 24 illustrates the path coefficients of the model and their respective levels of significance.

845 Cf. Liao (2006), p. 194.
846 Cf. Hiddemann (2007), p. 121.
847 Cf. Stone (1974); Geisser (1975).
848 Cf. Götz/Liehr-Gobbers (2004a), p. 731.
849 Cf. Chin (1998b), p. 318.
850 Chin (1998b), p. XIII.
851 Cf. Krafft et al. (2005), p. 83.

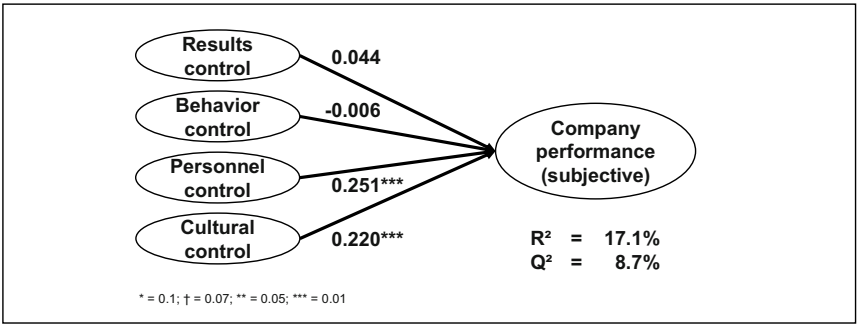

Figure 24: Summary of main model results[852]

Personnel control and cultural control both showed a significant positive impact on subjective company performance, while the path coefficients of results and behavior control demonstrate no effect on company performance. Both effect sizes of results and behavior control were found to be 0, while personnel control demonstrated an effect size of f_{PC}^2=0.050 and cultural control and effect size of f_{CC}^2=0.043. Hence, both indirect control forms can be considerated of a moderate effect size.[853]

Based on the path coefficients and their significance levels, the first set of hypotheses can now be inferred: the hypotheses concerning the effects of results control (H1a) and behavior control (H1b) were not supported by the data, while the hypotheses concerning personnel (H1c) and cultural control (H1d) were supported by the empirical data.

In general, the model showed satisfying levels of evaluation criteria across both its measurement and structural model. Hence, the model and its relationships is considered to be valid. The conclusions of these findings and implications for further research are discussed in Chapter 8.1.

7.2 Control combinations

This sub-chapter seeks to empirically answer two questions: which combinations are used in SMEs, and is there a difference in the performance consequences between high controls and other combinations?

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852 Own illustration.

853 Effect size $f^2=(R_{incl.}^2-R_{excl.}^2)/(1-R_{incl.}^2)$; $R_{incl.}^2$ is the coefficient of determination including the effect of the individual control form, while $R_{excl.}^2$ refers to the model without the control form. Cf. Cohen (1988), p. 413; Chin (1998a), pp. 316-317.

The methodological approach is different from the remaining part of the study. Structural equation modeling and, particularly, the partial-least-squares approach are focused on the prediction of *individual* relationships between latent variables in a complex model. Hence it is not suitable for the analysis of management technique configurations and their effects on performance. In order to answer the research interests concerning control combinations, this study chose an alternative approach: first, in order to investigate the usage patterns in SMEs it uses a classification into groups and conducts a descriptive analysis. Then, in order to determine performance implications of different control combinations it employs a univariate variance analysis and multiple-group comparisons.

Control combinations usage. As described in Chapter 2.2.3, control combinations can be segmented along the two dimensions of direct control and indirect controls.[854] Construct values for the overall concept of direct control (usage of both results and behavior control) are calculated based on the average values of the underlying constructs as well. Indirect control values are calculated respectively.

To segment the data sets into the four control combinations, two alternatives can be distinguished. First, the "distance-metric method" calculates vector-based distance scores between the individual control combination and the four theoretical control combination archetypes.[855] Then, the individual control combination is attributed to the control combination with the shortest distance. As a second alternative, the combinations can be segmented by using the median scores of the two distinct dimensions. CRAVENS ET AL. (2004) showed that in fact both segmentations yield similar results;[856] therefore, this study chose to use the median-based segmentation approach.[857]

When applying the aforementioned classification, a comparison of the elements of the matrix shows the predominance of either low or high control combinations in managerial reality: 110 companies (37%) used low control combinations, while high control combinations were employed by 97 companies (33%). 36 companies relied predominantly on clan controls (12%) whereas bureaucratic control combinations were applied by 52 companies (18%). The results are summarized in Figure 25.

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[854] Direct and indirect construct values are calculated using the average construct values of results and behavioral control (direct) as well as personnel and cultural control (indirect). The construct values of the individual control forms were calculated as the mean of the underlying indicators.

[855] Cf. Jaworski et al. (1993), p. 64.

[856] Cf. Cravens et al. (2004a), p. 246.

[857] The segmentation based on median values divided direct controls at 5.16 and indirect controls at 5.50.

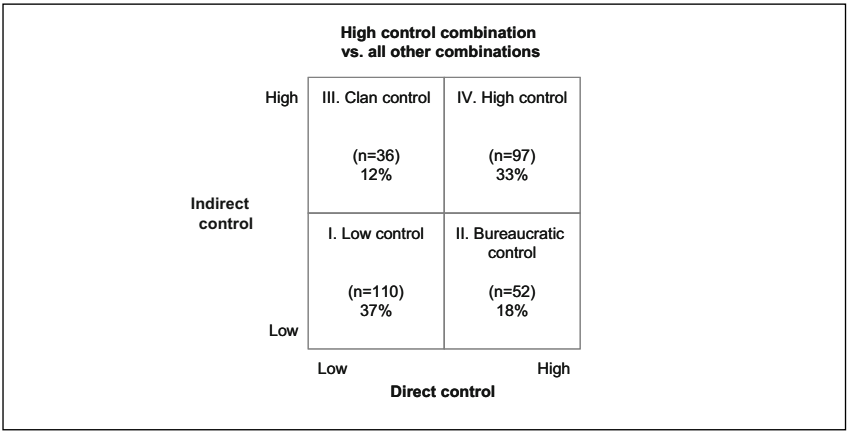

Figure 25: Usage of control combinations[858]

Performance consequences of control combinations. Secondly, this chapter aims at determining the consequences across the four control combinations. To analyze the effects, a variance analysis was carried out to measure the performance differences between the control combinations.

To determine the extent of a performance difference between high control combinations (IV) and other remaining combinations (I-III), an ANOVA was performed. The results indicate that in fact high control combinations are associated with a higher performance. The average performance of high control combinations (5.19) is significantly higher than the performance of the remaining control combinations (4.74) with an F-value of 14.33 ($p<0.01$). The results are visualized in Figure 26. As a result of this analysis, hypothesis H2 is confirmed by the data. Hence, the performance of organizations employing high control combinations is significantly better than the performance of the remaining SMEs.

[858] Own illustration.

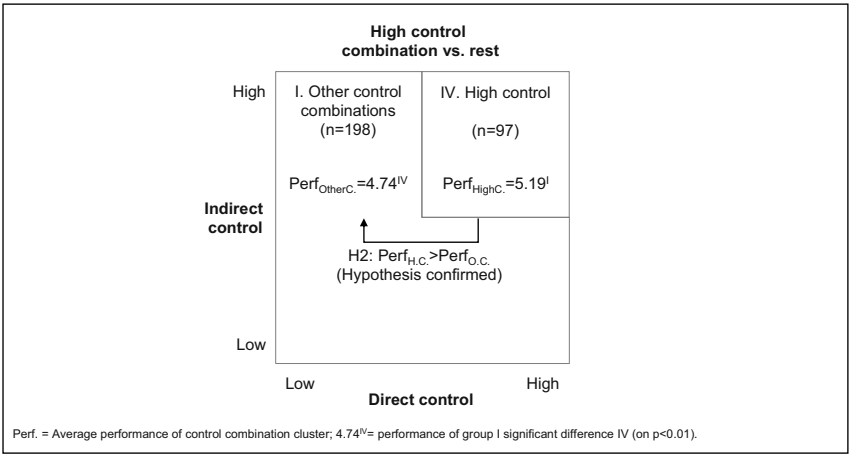

Figure 26: Summary of performance effect of control combinations (two control combinations)[859]

Although the developed hypothesis predicted only a difference between high control and the remaining three combinations together, the performance differences between the four groups are of particular interest. This study chose to use an analysis of variance including covariates (ANCOVA) due to two reasons. First, two dimensions (direct and indirect controls) are assumed to affect performance and an interaction effect between both cannot be precluded. Second, the two covariates of company size or age potentially impact company performance as well and had to be included in the analysis. The analysis is conducted using the software package SPSS 14 and the results are summarized in Table 21.

	Sum of Squares	df	Mean square	F-Value	Significance
Corrected model	20.94	5	4.19	4.52	0.00
Intercept	3222.68	1	3222.68	3478.49	0.00
Age	0.24	1	0.24	0.26	0.61
Size	0.07	1	0.07	0.07	0.79
Direct control	0.49	1	0.50	0.54	0.47
Indirect control	13.87	1	13.87	14.97	0.00
Direct*Indirect	0.01	1	0.01	0.01	0.98
Error	255.71	276	0.93		
Total	6992.10	282			
Corrected Total	276.64	281			

Table 21: Evaluation of control combinations with ANCOVA[860]

[859] Own illustration.

Three key findings emerge from the analysis. First, the size and age of the two covariates show no influence of any sort on the success of the control combinations (F-values 0.71 (size) and 0.263 (age)). Second, in line with the findings from the SEM in Chapter 7.1.2, indirect controls are associated with a significant effect on the company performance (F-value of 14.97), while direct controls are not associated with an effect on performance. Finally, an interaction between direct and indirect forms of control could not be confirmed by the data, as the F-value of the interaction was 0.

Now that the difference between the sets of control combinations has been shown, the next step is the comparison of performance levels across the four combinations. To eliminate the risk of type I (alpha) error accumulation as a result of multi-group comparisons, this study employed two approaches of Bonferroni and Gabriel.[861] Consistent across both tests, the performance of the high control MCS is found significantly larger than the performance of both low and bureaucratic combinations. However, although a minor difference between high control and clan control existed, it was found to be not significant. The results of the tests are summarized in Table 22.

Level of significance (by type of test)			
	Difference	Bonferroni	Gabriel
$\Delta Perf._{HighControl-LowControl}$	0.579	***	***
$\Delta Perf._{HighControl-Beaur.Control}$	0.461	**	**
$\Delta Perf._{HighControl-ClanControl}$	0.059	(n.s.)	(n.s.)
		*=0.1; **=0.05; ***=0.01; n.s. = not significant	

Table 22: Evaluation of control combination's performance consequences[862]

The results of this analysis, in particular the findings on the performance of SMEs using the four potential control combinations, are presented in Figure 27. The analysis shows that high control combinations are associated with the highest level of performance in comparison to all other individual control combinations. However, although high control is associated with a higher level of performance, only the performance differences between the high control and the low and bureaucratic controls are significant. Hence, the performance of clan control is lower; however, not significantly lower than the performance of organizations using high control combinations.

860 Own illustration.

861 For a detailed review on multiple mean comparisons and the relevant test procedures, see Backhaus et al. (2006), pp. 14-18.

862 Own illustration.

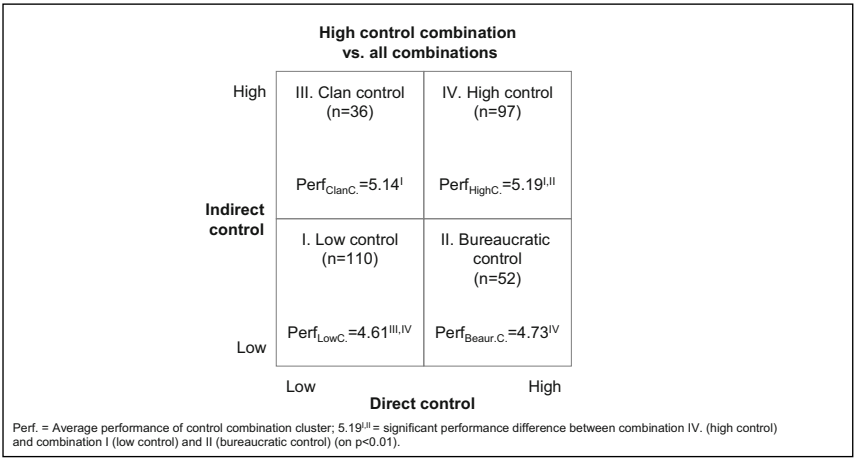

Figure 27: Summary of performance effect of control combinations (all control combinations)[863]

This study is able to show that managers in SMEs tend to employ either combinations of low or high control to influence employees' behavior and consider alternative combinations less. The analysis also reveals that SMEs employing high control combinations are more successful than companies employing an alternative combination of controls (*Hypothesis H2 confirmed*). With regard to the accumulation of performance effects, this study showed neither a positive nor a negative interaction effect for direct and indirect forms of control.

7.3 Moderating effects

Management control and its performance effect are expected to be not only of a universal nature, but also of a contingent one. To test this, the study developed a set of hypotheses for moderators of the performance effects. In the context of SMEs, this study hypothesizes a moderating effect of company age, company size, life cycle stage and management experience. In order to estimate the influence of the various factors on the path coefficients this study uses the method of group comparisons.[864]

The segmentation into groups is discussed for all moderators. The different resulting submodels are then evaluated on a model-by-model basis.

[863] Own illustration.
[864] For a review on the potential methdologies see Chapter 5.1.3.2.

7.3.1 Group segmentation

The full data set is split up into two groups to conduct group comparisons. The two groups are developed by using a segmentation criterion.[865]

- Company age. Company age was measured from market entry until the year of the survey (2007). By using a commonly accepted threshold[866] for young firms of 12 years, the data is split into a group of young companies (N=145) and a group of established SMEs (N=150).
- Company size. Size is arrived at by calculating the number of full-time equivalent employees in the organization, as provided by the SME. The median number of employees is used as a threshold for segmentation. This approach results in two groups, one group of small companies with less than 18 employees (N=142) and a group of large companies above the threshold (N=140).
- Life cycle stage. Based on a 5 item self-rating scale, the sample was split up into a group consisting of the first three life cycle stages (N=85) and a group of the remaining later stages (N=186).
- Management experience. The concept is conceptualized by using the cumulated number of years in a management position and the number of top management team members. The average years of experience per manager permits to subdivide the data set in a group of low experience (N=145) and a high experience group (N=144) using the median value of 12.7 years/manager.
- Ownership structure. Using a self-reporting indicator of their major shareholders, the ownership structure was used to form two groups: the first group encompasses all organizations with investor oriented shareholders (like Business Angels, VC funds, strategic partners; N=48) while the second group consists of all remaining organizations (N=247).
- Sector affiliation: Based on the data on sector affiliation supplied by the company, the sample was split up into two groups: the first group, industrial companies, consists of 127 companies, while the second group of service oriented companies consists of 162 data sets.

After the initial step of group segmentation, this study takes a three step approach to group comparisons.[867] First, the reliability and validity of the individual measurement models is determined. In addition, the structural models are evaluated separately. Secondly, the comparability of the separate models is evaluated. Finally, the path coefficients are assessed for significant differences and the hypotheses are tested.

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[865] In case a data point for the segmentation into the groups was not available, the data set was not considered for the group comparisons.

[866] Cf. Fallgatter (2004), p. 28; Bantel (1998), p. 207; Chrisman et al. (1998), p. 6; Li (2001), p. 183.

[867] Cf. for example Engelen (2008), pp. 239-270; Voll (2008), pp. 147-148.

7.3.2 Company age as a moderator

The initial step ensures that both the measurement and the structural model allow valid interpretations (in line with the assessment for stand-alone models). Both reflective constructs achieve satisfying results during their assessment in regard to measurement reliability. After eliminating one indicator (BC4), all other indicators showed loadings well above the threshold of 0.5. Consistency measures such as Cronbach's alpha, internal consistency and AVE confirmed measurement reliability in both sub-models as well. In addition, both reflective measurement models showed discriminance validity both on the indicator and construct level.[868] Together with the findings of Chapter 7.1.1.1 that assessed the content and nomological validity of the constructs, the reflective measurement models are assumed to be both valid and reliable. Hence, they can be used further in the analysis.

Consistent with the reflective constructs, the formative measurement models in both groups will be applied further in the analysis, as both weights (including significances) and multicollinearity measures (VIF-values, condition indices) showed satisfying levels within the required ranges. The detailed evaluation criteria and further information can be found in Appendix F on Table 31. In short, the constructs in both groups can be evaluated further during the group comparisons.

Both structural sub-models show satisfying results during their quality assessment as well. The coefficiencts of determination (R^2) even increase in comparison to the overall model and range between 22.1% (≤12 years) and 27.2% (>12 years). Both models have a sufficient level of prognostic relevance (Q^2) well above 0 and thus are analyzed further.

The second step in a group comparison determines if the constructs between the groups are actually comparable. The approach of this study to ensure this was previously outlined in Chapter 5.1.3.2. Both reflective measurement models show a satisfying coefficient of comparability (CoC) of 0.99. Hence the indicator loading structure between the constructs of both models can be assumed as being nearly identical. In the measurement models of personnel and cultural control, 2 out of 5 indicators show significant differences in their weights. Although slightly above the previously stated threshold of 30% different indicators, this study assumes that due to the extensive pre-tests ensuring a common interpretation, the constructs are in fact comparable. The results of the comparability assessment suggest that measurement equivalency between the groups can be assumed and that the effects between the subgroups can now be compared.

[868] The discriminant validity analysis is summarized in the Appendix F, Table 32 and Table 33.

During the third step, the path coefficients of both models are evaluated for significant differences. The comparison of the path coefficients is conducted by using the t-test as proposed by CHIN.[869] The calculated t-values are compared with theoretical t-values from the literature to determine the significance of the differences.[870] In short, the path coefficients show no significant differences among both groups. The results are summarized in Table 23. As this result was rather surprising, stability tests were carried out to determine if this result was a consequence of the group composition. However, the results remain stable: the models from up to 5 different sub-models show no difference in their path coefficients.

As the results of the moderated performance consequences yielded no significant differences, this study decided to enrich the conceptual discussion by combining the causal (performance consequences) with a descriptive analysis (usage intensity). The combination of both is expected to deliver valuable insights into the application of control. In order to determine the difference in usage patterns between the two sub-groups, the average indicator values are aggregated into one construct value per latent variable. The construct's mean values are then compared for significant differences using a t-test. The use of direct controls showed a significant difference between young and established SMEs. The construct values of established SMEs were found to be significantly lower than the construct values of the young SMEs. Table 23 integrates the results of the descriptive and causal analysis.

Group comparison (Company age)						
	Usage (Construct values)			**Performance (path coefficents)**		
	Group1 (=< 12 years)	**Group2** (> 12 years)	**Difference**	**Group1** (=< 12 years)	**Group2** (> 12 years)	**Difference**
RC	5.23	4.84	-0.39**	0.14	0.01	-0.13 (n.s.)
BC	5.04	4.81	-0.23†	-0.06	-0.13	0.13 (n.s.)
PC	5.03	5.01	-0.02 (n.s.)	0.35	0.36	0.02 (n.s.)
CC	5.76	5.59	-0.17 (n.s.)	0.18	0.30	-0.07 (n.s.)

n.a. = constructs not comparable (cf. weights diff. and CoC); Significance † = 0.23; * = 0.1; **=0.05; ***=0.01 (one sided)
n.s. = not significant

Table 23: Results group comparison company age[871]

As a result of this analysis, hypothesis 3 could not be confirmed by the empirical data. In addition, the analysis revealed that with increasing age, direct control forms are used less in SMEs.

[869] Cf. Keil et al. (2000), p. 315.
[870] For a summary of the methodology and the formula employed, refer to Chapter 5.1.3.2.
[871] Own illustration.

7.3.3 Company size as a moderator

Company size is expected to influence the performance effect of management control as well. Within the reflective measurement models, one indicator (BC4) is eliminated due to a loading below the threshold of 0.5. The remaining indicators show sufficient loadings; at the same time, all three construct reliability measures are adequate. The requirements for discriminance validity on both construct and indicator levels are met as well;[872] hence the reflective measurement models can be contained in the overall structural model. Similar to the reflective models, the formative constructs show adequate levels of weights. No multicollinearity is expected to be present in the data, as the VIF values remain well below the threshold of 10 with a maximum value of 3.47 (RC3, group 2). Similarly, the condition indices, referring to the aspect of multicollinearity of the construct, remain with a maximum value of 21.86, significantly below the maximum value of 30. In essence, the reflective and formative measurement models show sufficient levels of the key evaluation criteria and are, therefore, considered to produce valid and reliable measurements. Consequently, they can be employed further in this study. The evaluation criteria for company size as a moderator are summarized in Table 34 in Appendix F.

Both structural models show satisfying levels in relation to their explanatory value (R^2) and their prognostic relevance (Q^2): they were able to explain between 23% (large SMEs) and 27% (small SMEs) of the overall variance of company performance. Q^2 of both models is well above 0 which suggests that the models can actually have a prognostic effect. Hence, both structural models are assumed to be valid and are analyzed further.

The comparability of both measurement models is ensured as well. Both reflective constructs are highly consistent in terms of their indicator loadings structure (both CoCs 0.99). The formative measurement models yield only minor differences in their weight means. In the construct of results control, two indicators are different, while the indicators of the construct of personnel control show no difference in their construct weights. Hence, in line with the approach of the prior group comparison, the comparability of the constructs is assumed to be acceptable and both models are considered further.

The comparison of path coefficients shows that the performance effect of control changes significantly with increasing company size. In particular, the effectiveness of direct controls decreases from a medium effect level down to no effect in larger organizations. Both results and behavior control decrease by the same amount with increasing size, however, only the decrease of behavior control is significant. In contrast to direct controls, the effectiveness of

[872] The discriminant validity analysis is summarized in the Appendix F, Table 38 and Table 39.

cultural control even increased with the size of the SME. Personnel control effectiveness was not affected by the company size at all.

In line with company age as a moderator, a descriptive analysis was conducted to determine usage patterns in SMEs. The descriptive analysis showed that the means of direct controls constructs decrease with increasing size. In other words, larger SMEs in the sample use less direct controls. Indirect controls were not affected by this; the usage remains constant with increasing size.

Group comparison (Size)						
	Usage (Construct values)			Performance (path coefficents)		
	Group1 (Small)	Group2 (Large)	Difference	Group1 (Small)	Group2 (Large)	Difference
RC	5.03	4.71	-0.32*	0.23	0.06	-0.18 (n.s.)
BC	5.08	4.72	-0.37***	0.13	-0.04	-0.16†
PC	5.02	5.01	0.00 (n.s.)	0.23	0.22	-0.01 (n.s.)
CC	5.74	5.60	-0.14 (n.s.)	0.11	0.34	0.23†

n.a. = constructs not comparable (cf. weights diff. and CoC); Significance † = 0.23; * = 0.1; **=0.05; ***=0.01 (one sided)
n.s. = not significant

Table 24: Results group comparison company size[873]

To sum up, hypotheses H4b and H4d are both confirmed by the data, while H4a and H4c are not supported by the data. In line with the findings on company age, this study found that the larger an organization gets, the less it utilizes direct controls.

7.3.4 Company life cycle stage as a moderator

The comparison of SMEs by their life cycle stage begins with the assessment of the individual measurement models:[874] indicators of both reflective measurement models demonstrate sufficient weights, while the overall constructs criteria such as Cronbach's alpha, internal consistency and AVE, exhibit strong reliability as well. No indicators are removed due to potentially low loadings and the discriminant validity on both indicator and construct level is ensured as well.[875] At the same time, results and personnel control show sufficient levels of VIFs and CI and can be interpreted further as well.

Both structural models demonstrate satisfying levels of R^2 and Q^2. The structural model of early-life cycle SMEs is of particular interest: management control forms in this case are able to explain a significant higher proportion of the company performance variance in comparison to other structural models. The model suggests that 52.7% can be attributed to the usage of the four management controls. Later stage SMEs exhibit an R^2 which was significantly lower

873 Own illustration.
874 Detailed evaluation parameters are presented on Table 37 in Appendix F.
875 The discriminant validity analysis is summarized in Appendix F, Table 38 and Table 39.

(15.2%) than the early-stage R^2. As the coefficients of prognostic relevance (Q^2) are above 0 as well, the analysis suggests a sufficient level of overall structural model quality.

The evaluation of both models demonstrates a sufficient level of comparability. The reflective constructs are assumed to be highly consistent, as their coefficients of congruence is 0.99 for both groups and constructs. Two indicator weights (RC1, RC3) of the results control construct differed from another on the 0.05 signficance level, while only one indicator (PC3) of the personnel control construct showed a substantial deviation.

The comparison of the path coefficents exhibits a significant decrease in the effectiveness of both indirect controls. The effectiveness of personnel and cultural control decreases from a very high level of 0.40 (CC) and 0.47 (PC) down to a moderate impact of 0.17 (CC) and 0.32 (PC). Despite the decrease in effectiveness, both indirect control forms remain significantly positive for SMEs in a later stage of the SME. The path coefficients of direct controls remain unchanged.

In relation to the usage patterns of controls in earlier phases of the company life cycle in comparison to the later phases, the comparison of the two groups exhibit no significant differences. Hence, the control usage remains constant between both groups, while the indirect control effectiveness decreases.

Group comparison (Company lifecycle)						
	Usage (Construct values)			Performance (path coefficents)		
	Group1 (Early phases)	Group2 (Late phases)	Difference	Group1 (Early phases)	Group2 (Late phases)	Difference
RC	5.17	4.94	-0.23 (n.s.)	0.12	0.03	-0.10 (n.s.)
BC	4.96	4.89	-0.07 (n.s.)	-0.20	-0.09	0.11 (n.s.)
PC	4.94	5.04	0.10 (n.s.)	0.47	0.32	-0.15†
CC	5.80	5.68	-0.11 (n.s.)	0.40	0.17	-0.22†

n.a. = constructs not comparable (cf. weights diff. and CoC); Significance † = 0.25; * = 0.1; **=0.05; ***=0.01 (one sided)
n.s. = not significant

Table 25: Results group comparison company life cycle[876]

With regard to the impact of life cycle stages on the application intensity of controls, the data suggests no change. On the other hand, company life cycle stage is expected to moderate management control effectiveness: the performance effect of indirect controls decreases with the later life cycle stages. Hence, hypothesis 5 cannot be confirmed by the empirical data.

[876] Own illustration.

7.3.5 Management experience as a moderator

The analysis of the impact of management experience as a moderator starts off with the analysis of the formative constructs. The indicators exhibit a maximum VIF level of 3.36 and a condition index of 19.82 that are both well below the thresholds of 10 and 30 respectively. Two indicators from the reflective construct of behavior control (BC2 and BC3) are removed due to low levels of loadings. In addition, the behavior control construct does not meet the minimum level of 0.7 of Cronbach's alpha in both groups: group 1 shows a level 0.56, while group 2 exhibits a value of 0.62. However, as the internal consistency indices (which are a further development of the Cronbach's alpha value) show levels well above 0.7, the measurement model is still expected to be adequate for further evaluation. All loadings and consistency measures of the reflective construct of cultural control demonstrate sufficient levels of assessment.[877] In line with the measurement models, the structural models of both groups reach sufficient levels of determination and can hence be compared during the next step. All relevant data of the group comparison can be found in Table 40 in Appendix F.

The comparability of the constructs is ensured as well, as the congruence coefficients of the reflective constructs demonstrate sufficient levels between 0.94 (BC) and 0.99 (CC). The construct of results control is eliminated from further analysis as 3 out of 5 indicators weights are significantly different across both groups. Personnel control shows low-significant differences at 2 out of 5 indicators; however, in line with the previous group comparisons, the construct is considered further.

A descriptive analysis of the data reveals that the extent of direct and indirct control usage does not differ between both groups. Hence the application and usage intensity remains constant across the groups.

In contrast to the descriptive findings, the comparison of the path coefficients reveals that the construct of behavior control is in fact impacted by management experience. The path coefficient declines from no effect in inexperienced teams to a negative effect in the context of highly experienced managers (> 12.7 years/manager). The path coefficient of results control cannot be assessed, as it was eliminated from the comparison due to a significant number of diverging indicator weights between both groups. Both remaining indirect control constructs demonstrate no significant differences in their performance effect.

[877] The discriminant validity analysis is summarized in Appendix F, Table 41 and Table 42.

Group comparison (Management experience)						
	Usage (Construct values)			Performance (path coefficents)		
	Group1 (Low)	Group2 (High)	Difference	Group1 (Low)	Group2 (High)	Difference
RC	4.95	4.83	-0.12 (n.s.)	0.24	0.07	n.a.
BC	4.75	4.83	0.08 (n.s.)	0.01	-0.28	-0.29*
PC	5.08	4.93	-0.14 (n.s.)	0.14	0.29	0.15 (n.s.)
CC	5.65	5.69	0.04 (n.s.)	0.34	0.28	-0.06 (n.s.)

n.a. = constructs not comparable (cf. weights diff. and CoC); Significance † = 0.23; * = 0.1; **=0.05; ***=0.01 (one sided)
n.s. = not significant

Table 26: Results group comparison management experience[878]

To sum up, the comparison of the construct values between both groups exhibits no differences in the application of the four control forms. In relation to the performance effect of control, an increased level of management experience has negative impact on behavior control effectiveness. The performance effects of the other control forms are not impacted by an increased level of management experience. Hence, hypothesis 6 on the positive effect of management experience on the effectiveness of the four control forms is not supported by the data set.

7.3.6 Control variables: finance structure and sector affiliation

To test the stability of the results, this study employs the two control variables of sector affiliation and shareholder structure. Both control variables were evaluated in line with the moderators: after splitting the data set into two groups, the resulting models were evaluated. Then, after controlling for comparability of the models, the path coefficients were assessed for significant differences in their heights.

The control variable of *sector affiliation* reveals no significant differences between the group of industrial organizations and the group of service oriented SMEs. Management control efficiency is, therefore, expected to be consistent across a broad range of sectors and is independent of industry affiliation.

No significance difference is found in relation to the control variable of *shareholder structure*. Control-performance relationships show no variations in terms of the altitude of their path coefficients in the presence of different financial stakeholders. However, the two groups differ significantly in relation to their sizes.[879] Hence the interpretation of the results is subject to a certain bias.

[878] Own illustration.

[879] While the group with investment oriented stakeholders consisted of 48 data sets, 247 organizations had no investors involved in their organization. Previous research suggests a group size ratio of maximum 1.5; refer also to Stevens (1996), p. 249; Hiddemann (2007), p. 110.

7.4 Results overview

This chapter evaluated the effects of management control empirically. After assessing the measurement and structural models, the previously developed hypotheses were tested with the data set. Structural equation modeling was used to determine direct and moderating effects of management control forms on company performance. Usage of control combinations and their performance implications were analyzed using a descriptive analysis.

In general, management control proved to be a success factor in SMEs, as the model exhibits a coefficient of determination (R^2) of 17.1%. The hypothesized positive performance effect of indirect controls was supported by the empirical data. In addition, this positive performance effect was stable across all structural models. The hypotheses on the positive performance effect of results and behavior control were not supported by the data. Hypotheses in relation to control combinations were confirmed as well; hence high levels of control activities were found to be beneficial for the organization and were associated with superior company performance.

Despite the direct effects, management control effectiveness was found to be moderated by different factors, especially by company size and management experience. However, not all hypothesized relationships could be confirmed by the data. Table 27 summarizes the results of the hypotheses testing. The following chapter reviews the findings and discusses them in the light of previous research.

Function	Hypothesis	Result
Direct effects	H1a) Results control usage intensity is positively related to the company performance of SMEs.	Confirmed (0.16**)
	H1b) Behavior control usage intensity is positively related to the company performance of SMEs.	Not supported (n.s.)
	H1c) Personnel control usage intensity is positively related to the company performance of SMEs.	Confirmed (0.25***)
	H1d) Cultural control usage is positively related to the company performance of SMEs.	Confirmed (0.22***)
Control combinations	H2) A high control combination is associated with superior performance in comparison to all other control combinations in SMEs.	Confirmed (14.33***)
Company age	H3) The usage intensity of the four management control forms is associated with a stronger effect on performance in older SMEs in comparison to younger SMEs.	Not supported (n.s.)

Function	Hypothesis	Result
Company size	H4a) Results control usage intensity has a lower effect on performance in larger SMEs in comparison to smaller SMEs.	Not supported (n.s.)
	H4b) Behavior control usage intensity has a lower effect on performance in larger SMEs in comparison to smaller SMEs.	Confirmed (-0.16†)
	H4c) Personnel control usage intensity has a stronger effect on performance in larger SMEs in comparison to smaller SMEs.	Not supported (n.s.)
	H4d) Cultural control usage intensity has a stronger effect on performance in larger SMEs in comparison to smaller SMEs.	Confirmed (0.23†)
Company life cycle stage	H5) The usage intensity of the four management control forms is associated with a stronger effect on performance in the later phases of the life cycle in comparison to the earlier phases of SMEs.	Not supported (n.s.)
Management experience	H6) The usage intensity of the four management control forms is associated with a stronger effect on performance while being executed by a more experienced manager in comparison to a less experienced manager in SMEs.	Not supported (n.s.)

Comments

- Values in parantheses are path coefficients or path coefficient differences; exception of hypothesis H2: F-Value of the ANOVA
- Levels of significance: † = 0.21; * = 0.1; **=0.05; ***=0.01 (one tailed)

Table 27: Summary of hypotheses testing[880]

[880] Own illustration.

8 Discussion and conclusion

In the final chapter the empirical results are presented and discussed in the light of previous research. Chapter 8.1 summarizes the findings in relation to the research questions. Chapter 8.2 reviews the results that emerge from the empirical analysis. Implications for further research are summarized in Chapter 8.3, while managerial implications are presented in Chapter 8.4.

8.1 Reflection on research questions

Based on the evaluation of previous research, this study developed a set of research questions in order to extend existing knowledge on MCS further. During the following section, the research questions are restated and the answers summarized.

> *Research question 1): Which management control forms have the strongest performance effect on SMEs?*

Personnel control and cultural control are associated with a significant impact on company performance, while results and behavior control show no effect on performance. Both indirect control forms demonstrate satisfying effect sizes and their path coefficients were positive throughout nearly all models. Increasing the control intensity led to a subsequent increase in the company performance of the SMEs. Behavior control, on the other hand, exhibits no performance effect throughout the majority of the models. Consequently, its application to influence managers' behavior should be restricted to situations where it is absolutely required for other reasons. Results control demonstrates no significant impact on the performance in the general model as well; however, this study still assumes results control to be an important and success-critical management technique. Due to the broad adoption of results control techniques, its differentiating effect in relation to company performance seems to be limited.

> *Research question 2): What is the difference of the performance effect between young and established small and medium organizations?*

An increasing body of literature reflects on the characteristics of MCS in young firms and describes how they change their structure over time. However, evidence on this assumption in relation to the effectiveness of the controls remains scarce, as no study compared the performance effects of MCS between young and established organizations until today. This study indicates that the effectiveness of the control forms does not differ between young SMEs and established SMEs. Even extended group comparisons between several sub-groups showed no significant path coefficient differences between young and established SMEs. The

relevance for future young firm's MCS analysis, entrepreneurship and methodological consequences, will be further elaborated in following chapters.

Research question 3) Which management control combinations are used in SMEs and what combinations are most beneficial for SMEs?

Managers in SMEs use either a combination of low or high control. Together, these two configurations represent over 70% of all MCS in this sample SMEs.[881] Significantly, fewer respondents used a combination with an unbalanced set-up: 36 companies relied predominantly on clan controls (12%) whereas bureaucratic control combinations were applied by 52 companies (18%). In relation to its performance effect, this study's results demonstrate that a high level of both direct and indirect controls is associated with a significantly higher company performance in comparison to alternative forms. Companies using multiple techniques to influence employee's behavior are able to influence actions in different dimensions and to transmit information on desired goals respectively.

Research question 4): Which environmental factors moderate the effectiveness of management control forms?

Life cycle oriented variables (company age, company size, corporate life cycle stage, and management experience) are evaluated with regard to their impact as moderators. The effectiveness of management controls was found to be influenced by company size, corporate life cycle stage and management experience. Unexpectedly, company age had no moderating impact on the performance consequences of management control. In general, the analysis suggests that management control is in fact rather a universal than a contingent success factor for SMEs.

Summarizing the reflection on the research questions, indirect control forms demonstrate superior importance for the effectiveness of management control and work best in conjunction with high levels of direct control forms. However, an anticipated difference in the performance effect between young and established firms is not supported by the data. The following chapter discusses these findings in the light of previous research and provides potential avenues for further research.

[881] A total number of 110 companies (37%) used low control combinations, while high control combinations were employed by 97 companies (33%). Refer also to Chapter 7.2.

8.2 Review of the findings of the study

Results in the previous chapters were presented in the light of the different models and samples used for the comparisons. To summarize findings and implications for further research, this chapter presents research findings and implications structured by conceptual domains like control forms, control combinations and the nature of management control.

From a general perspective, this study proves that management control is a valid success factor for SMEs, explaining 17.1% of the company performance variance. Management control is in fact an effective approach to influence employee behavior and to ensure that developed plans and strategies are actually implemented. The results are in line with other studies of MCS and related areas of management functions.[882]

In relation to the effectiveness of individual control forms, this study illustrates the dominance of indirect over direct control forms. Indirect control forms show significantly stronger performance implications than direct control forms. This finding is particularly interesting, as it contradicts the traditional understanding of MCS as being "formal, information-based routines and procedures managers use to maintain or alter patterns of organizational behavior."[883]

8.2.1 Findings on the individual control forms

The following section reviews and discusses the results in the context of the four individual control forms: results control, behavior control, personnel control and cultural control.

Results control. Results control is associated with setting goals and targets for employees and the incentivization of successful target achievement. The employees then act upon their own decisions and strive at achieving the defined targets. Its positive effect on company performance was previously shown in other studies.[884] This study was not able to confirm these findings in the analysis of the main model, as the path coefficient of results control is 0.00 and not significant. Hence, hypothesis H1a was not supported by the empirical data.

An interpretation should be conducted with care. This study measured the control intensity present in SMEs. Hence the study can only make predictions on the effects of an increase of control intensity on the company performance. For results control, the control intensity is neither associated with an increase nor a decrease of company performance. Hence for SMEs, the results suggest that an additional amount of results control intensity does not have any

[882] Cf. for example Liao (2006), p. 194; Berthelot/Morrill (2007), p. 14; Hiddemann (2007), p. 121.
[883] Simons (1994), p. 5.
[884] For example Merchant (1981), p. 813; Hiltrop (1996), p. 17; Duh et al. (2006), p. 353.

effect on the organizational performance. In particular, if an SME seeks to choose the optimal level of results control, it should choose the minimum level, as an increase would not yield any difference. The additional effort for preparing and conducting results control does not translate into an additional performance effect and pays off. Previous research on results control in large organizations showed a positive effect of results control.[885]

However, as outlined, the findings suggest that this effect does not hold true in SMEs. An increased level of results control is also associated with additional effort and complexity: new budgets have to be defined or more sophisticated incentive schemes to be developed. Especially in SMEs and their liability of smallness, such an increase can be assumed to overwhelm the organization, which is typically short of resources. One might speculate that both managers and subordinates are expected to be rather penalized from an increase than to profit from it. In relation to the adoption of management control forms in SMEs, researchers found that an early implementation of results control techniques is in fact beneficial for the SME.[886] The recommendation from these findings for SMEs is twofold. On the one hand, SMEs are urged to introduce results control early in their lifecycle in order to profit from its benefits. On the other hand, the findings do not suggest an intensive application and level of sophistication, since the additional preparatory effort will affect company performance. Results control should in fact be introduced, but it should be restricted to the minimum level of intensity.

Despite the findings on the results control consequences in SMEs, the design and application of results control should be considered wisely. Especially in the light of the recent turbulences in the international financial markets, the incentive structure needs to be designed appropriately.[887] One might speculate that a careful selection of short and long-term as well as monetary and non-monetary rewards should be considered while developing results control.

In summary, the general model demonstrates no effect of results control on company performance. In the context of of SMEs the application of resukts control is recommended, however, only with a low intensity, as an additional performance effect is existent. Especially the aspect of explicit goal definition and the considerably large degree of autonomy are expected to be beneficial components of results control in SMEs.

Behavior control. Behavior control refers to the definition of working steps with the employees to structure the target achievement process instead of only incentivizing the target achievement itself.[888] The empirical results do not exhibit a positive performance impact of

[885] Cf. Otley (1978), p. 146; Merchant (1981), p. 813.
[886] Cf. Davila/Foster (2005), p. 1065; Carlson et al. (2006), pp. 538-540.
[887] Cf. Nagl (2008).
[888] See Chapter 2.2.2.

behavior control usage in SME. The main model yielded no effect on performance at all (effect size f^2=0.00, path coefficient PC=0.01, Hypothesis H1b not supported).

In line with results control, the findings require further discussion. The results suggest that an increase in behavior control intensity is not associated with an increase in performance. In a reverse conclusion, organizations should not seek to invest into increasing behavior control activities. The result is in line with another finding on behavior control. CHANDLER/MCEVOY (2000), for example, support this result as they show that the usage intensity of process-oriented management (TQM) is not associated with any direct performance effect.[889]

In contrast, the finding is of particular interest in the light of previous findings on the positive impact of behavior control in large organizations.[890] The differences highlight the impact of SME's characteristics on the managerial activities. This study identified three potential explanations for this finding. First, by pre-defining work steps and regular process reviews, the motivation of employees potentially decreases. In case behavior control is increased, this is also potentially associated with a decrease in entrepreneurial spirit and result in lower company performance in the long-term.[891] Secondly, as behavior control is associated with significant control costs for monitoring employees actions in detail (e.g. by conducting time-consuming review meetings or reaching an agreement on the target achievement process), the control costs outweigh the benefits of this form of control. This seems to be particularly valid for SMEs, as management resources are scarce and owner/managers are typically involved in a broad variety of functions. The time available for a manager to perform control is highly restricted and is not efficiently used when performing behavior control. A third potential reason for the absence of a performance effect is the area of application. This study chose to investigate the relationship of an owner/manager and his direct subordinates. As the owner/manager typically interacts with the leaders of different functional areas, his subordinates are presumably managers as well. In general, the managers of funtional departments enjoy a significant amount of independence to pursue goals by themselves and are used to a certain amount of work autonomy. In the case of the application of behavior control, however, the manager is required to interact frequently with his superior manager and to yield a part of his autonomy. Especially for a manager, this is expected to have a negative effect on motivation and ultimately on his entrepreneurial orientation.

Research on the introduction of behavior oriented management controls suggest that the early introduction supports the management and provides immediate guidance to the employees. DAVILA/FOSTER (2007) found that the rate of adoption of a set of management control

[889] Cf. Chandler/McEvoy (2000), pp. 51-52; also in the field of TQM Taylor/Wright (2003), p. 104.
[890] See Chapter 4.1.2.2 and 4.1.2.3.
[891] Cf. Sandino (2007), p. 268.

techniques (from all four control forms suggested) has a positive effect on the company size, number of employees and presence of VC capital.[892] Together with the findings on the neutral effect of control intensity, SMEs can be advised to introduce behavior controls as soon as possible during their lifecycle. However, they should seek to target a modest level of behavior control, e.g., by only focusing on key activities, excluding defined functional areas or reducing the process review frequency.

In essence, behavior control shows no performance effect throughout this study. Hence the results do not recommend an increase of its application; however, it should be introduced in a low intensity. The absence of a performance effect in SMEs is assumed to be caused by a decreasing motivational effect and the reduction of individual autonomy. These reasons are expected to be specifically linked to the characteristics of SMEs. Especially, a decrease of autonomy is assumed to be critical in the application to subordinate managers. However, due to regulatory or managerial restrictions, behavior controls are still potentially indicated (e.g. anti-fraud processes or quality management systems).

Personnel control. Personnel control supports management by building on the employees' natural tendency to control and motivate themselves.[893] The results demonstrate the significant importance of personnel controls for SMEs. The results demonstrate a moderate effect size of $f^2=0.05$ (path coefficients 0.251, $p<0.05$, H1c confirmed).

Hence, the findings suggest that personnel control is in fact a success factor in SMEs. An increase of usage is also reflected in an additional effect of company performance. An organization seeking to invest in control activities should increase its efforts and increase the indirect mechanism of HRM to increase their level of control. The findings are in line with previous research both from large organizations[894] and SMEs[895], especially in the field of HRM that found a positive effect of control relevant to HRM techniques on company performance. As such the results support the assumption that personnel control is especially valuable for SMEs. Due to the low level of managerial resources and informal management approach within SMEs, personnel control allows distributing an additional control investment across the entire employee base and thus decreases the control costs for the individual. The application to top-management teams proved to be especially beneficial: since cause-effect knowledge is incomplete and standards of desirable performance are ambiguous,[896] personnel

892 Cf. Davila/Foster (2007), pp. 921-930.
893 Merchant/Stede (2003), p. 74; see also Chapter 2.2.2 for a broad review.
894 Cf. for example Snell/Youndt (1995), p. 731; for a detailed overview of previous empirical studies refer to Chapter 4.1.3.
895 Cf. for example Astrachan/Kolenko (1994), p. 255; Leon-Guerrero et al. (1998), p. 116; Carlson et al. (2006), pp. 537-540.
896 Cf. Ouchi (1979), p. 844; Snell (1992), p. 298.

control provides guidance without prescribing autonomy-seeking managers how to pursue their goals.

The importance of personnel control, however, is not only noticed by researchers, but also by practitioners. A successful entrepreneur once remarked about the benefits of personnel control for him: "My management style is to hire good people and develop a relationship with them so that 95% of the time they'll know what decision I'd make and go ahead without asking me."[897] This statement is well in line with different interviews conducted during this reseach study. Hence, implicitly, the control effect of an effective HRM seems to be familiar to SME managers. The results of the analysis provide empirical evidence for this assumption.

To sum up, personnel control proves to be a strong success factor for control in SMEs. The results highlight the relevance of HRM for management and extend HRM by management control.

Cultural control. Cultural control influences norms and values in organizations which aim at influencing employee behavior. The application of cultural control has a positive impact on the company performance of SMEs (Hypothesis H1d confirmed) and has a moderate overall effect size of $f^2=0.043$ (path coefficient strength of 0.220, $p<0.05$).

Similar to personnel control, cultural control is considered an effective mechanism to increase the performance of an organization. Research on the effect mechanisms shows that this is achieved by an incorporation of values and a subsequent behavioral change.[898] As the employees align with the organization's goals and as resources are assigned in an optimal way, the performance of the organization increases.[899] The positive performance effect is in line with other findings that suggest that a dedicated corporate culture (e.g. market orientation) is able to influence organizational behavior and ultimately the company performance itself of young firms.[900] However, evidence on management control as a function of corporate culture has been scarce.[901] This study is able to show empirically that in fact corporate culture influences individual's behavior which aligns the individual with the overall goals in SMEs.

Besides the direct effect of cultural control on employees' behavior, it is supported by the application of personnel control, for instance, by preselecting and hiring candidates who

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897 Unknown (1983).

898 Similar results have previously been found in the area of corporate culture and its effect on performance. Cf. for the effect of market oriented behavior Pelham/Wilson (1996), pp. 29-30.

899 Cf. Sykianakis/Ballas (2008), p. 32.

900 For an example on the impact of market orientation on company performance, refer to Claas (2006), pp. 223-224; refer also to Brettel et al. (2008a), pp. 1207-1208.

901 Cf. Granlund/Taipaleenmaki (2005), pp. 46-48.

already show the predisposition to adapt to cultural control and social mechanisms. Once hired, additional training or feedback (techniques within personnel control) are also expected to support cultural controls and vice versa. Empirical indication for this assumption is derived, on the one hand, from the strong effects of personnel control in the individual models and, on the other hand, from the significant contribution of indirect control techniques to control combinations in 7.2.

This study provides strong indication for the effectiveness of cultural control forms and the underlying mechanisms of social control. The findings suggest that corporate culture in fact carries a function of control and can be influenced to achieve desired behavior amongst employees.

8.2.2 Findings on the combination of control forms

Results of the analysis on control combinations are promising, as they suggest their importance for organizational reality. The majority (70%) of respondents apply combinations of either high or low controls, the remaining 30% use asymmetric (with either direct or indirect controls being dominant) control combinations. In line with the hypothesis, high control combinations are associated with the strongest performance effect in comparison to the remaining control combinations (*H2 confirmed*).

Two conclusions emerge from these results. First, managers choose their MCS based on the paradigm of either applying the full control intensity on all dimensions or, on the contrary, a low intensity. Only a smaller group of managers actually use a control combination that primarily employs either direct or indirect control. Second, a high control combination is beneficial as it transmits and receives information and feedback on multiple dimensions and channels.

The results are in line with previous findings on control combinations. In their work on control combinations in sales & marketing, JAWORSKI ET AL. (1993) found that high control combinations are associated with the highest levels of employee satisfaction and both low levels of person-role conflicts and ambiguity.[902] CRAVENS ET AL. (2004) identified high control combination to be associated with beneficial consequences,[903] but in contrast to the work of JAWORSKI ET AL., their analysis shows that high control combinations had a positive

[902] Cf. Jaworski et al. (1993), pp. 66-67.
[903] Cf. Cravens et al. (2004a), p. 246.

effect on individual's sales performance.[904] The results also gained significant interest of practitioners and were thus published in the Marketing Management Journal in 2004.[905]
In this context, it is important to point out that CRAVENS ET AL. (2004) compared the performance effect of high control combinations with the remaining control combinations (all three combined in one group).[906]

Besides the confirmation of both studies, this thesis makes an additional contribution: it transfers the concept of control combinations to a more general level, namely the field of general management. Previous research focused solely on the sales & marketing context, however, the findings of this study indicate that the results are similar in an alternative functional area.

However, when considering the multi-group comparison between the four combinations, a slightly different picture emerges. While high control combinations are associated with the highest performance, the difference to the performance of clan control is not significant.[907] In other words, an organization is able to achieve nearly the identical level of performance by only employing personnel and cultural control in conjunction. Based on the considerations in the previous chapter, one might speculate that the success of an MCS is primarily driven by the indirect controls. In case this assumption holds true, the additional effort invested in direct controls does not pay off. Consequently, the most favorable control combination, when considering both outcomes and invested effort, is in fact clan control. When integrating the findings of this causal analysis and the descriptive analysis, another finding emerges: Although clan control is the most favorable control combination, only 12% of the respondents actually used it. This gap between the existence of a high-performance control combination and the low usage of it calls for further research and action. Theses findings should not be interpreted in the sense that all direct controls should be abandoned. As Chapter 8.2.1 showed, the introduction of direct controls (even with low intensity) is already a success factor in SMEs.

In addition to the findings above, no interaction effects between direct and indirect control forms was found. One might have speculated to see a positive interaction effect, i.e., that both control forms reinforces each another. However, no empirical evidence for this assumption was found.

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904 Cf. Cravens et al. (2004a), pp. 246-247.
905 Cf. Cravens et al. (2004b).
906 Cf. Cravens et al. (2004a), p. 246.
907 See Chapter 7.2.

In short, high control combinations are found to be associated with a superior effect on company performance. The results of this study strongly indicate that the concept of management control combinations can be extended from the field of sales & marketing to other fields like general management or small business management. Further research is encouraged to extend this concept conceptually and empirically.

8.2.3 Evaluation of the contingency perspective on management control

One of the key contributions of this study is the evaluation of management control from a universal perspective as well as from a contingency perspective. Two relevant findings emerge from this analysis: first, this study found ambiguous evidence on the nature of control; second, indirect controls are found to be a universal success factor with a stable performance effect throughout the majority of the models.

Ambiguous evidence for a contingent nature. This study addresses the question of the nature of control by investigating both types of models in its research. First, it calculated the effects of control on a stand-alone basis without the incorporation of any contingent factors. The second perspective used a set of four contingent factors and determined the effect of the factors on the effectiveness of the four management control forms. The results of the analyses are ambiguous. On the one hand, the use of a contingent factor to build the models increased the variance explained of the endogenous variable significantly. The R^2 of the contingent models were consistently stronger than the R^2 of the basic model without the contingent factors. While the basic model is able to determine 17.1% of the company performance variance, the next best model accounts already for 22.1% of the company performance variance, an increase by 5% points or 29%.[908] The maximum R^2 even yielded a variance explained of 52.7% (early phases of lifecycle). Previous research in the management field determined that the choice of one perspective can build on the variance explained by the models. ROBINSON/MCDOUGALL (2001), in their study on the universal or best-practice nature of entry barriers in the Strategic Management Journal, argue that an increase in variability explained is strong indication of the nature of a research object.[909] These findings hence suggest the superiority of a contingency approach for management control.

On the other hand, the impact of the moderators on the management control effectiveness is rather low. Moderators showed only an impact on 5 out of 16 potential effects (31%).[910] Figure 28 summarizes the effects of the moderators by management control form. From an overall perspective, the impact of the moderators on management controls is rather low. This

[908] With the exception of the structural model covering the later lifecycle stages (R^2=15.3%).
[909] Cf. Robinson/McDougall (2001), p. 678.
[910] Four management controls times four contingent variables.

could be attributed to either not the right contingent factors and on the other side actually a low impact of the moderators. As the contingent factors were derived from theory and previous research, the second interpretation is favored which assumes that the moderator's impact is in fact low. This result also indicates an alternative finding: as the impact of the moderators on the overall model is rather low, the results are expected to be of a robust nature. One could conclude that the model was selected successfully and that the findings of the overall model can be generalized to a broad variety of SMEs.

	Company age			Company size			Life cycle stage			Management experience		
	As-sumed	Empiri-cal	Con-firmed?	As-sumed	Empiri-cal	Con-firmed?	As-sumed	Empiri-cal	Con-firmed?	As-sumed	Empiri-cal	Con-firmed?
Results control	+	./.	✗	−	./.	✗	+	./.	✗	+	./.	✗
Behavior control	+	./.	✗	−	−	✓	+	./.	✗	+	−	✗
Person. control	+	./.	✗	+	./.	✗	+	−	✗	+	./.	✗
Cultural control	+	./.	✗	+	+	✓	+	−	✗	+	./.	✗
Hypo-thesis		**(H3)**			**(H4a- H4d)**			**(H5)**			**(H6)**	

Legend: Positive effect + Negative effect − No effect ./. Confirmed ✓ Not confirmed ✗

Figure 28: Summary of impact of moderators on control effectivness[911]

In essence, the results on the nature of management control are ambiguous as the strong increase in R^2 of the different submodels suggests a contingent perspective, while the low impact of the moderators on management control effectiveness rather suggests a universal perspective.

Indirect controls as a success factor. Indirect control has been identified as key success factors for management control in SMEs. They are thus now discussed with regard to their stability as a success factor. Instead of a discussion of the general impact of contingent on control as outlined in the previous section, this section considers the moderators rather as a stress test for the universal perspective of indirect controls.

Indirect controls were also found to be a strong success factor throughout the majority of the sub-models. Despite the strong impact already in the main model, personnel and cultural control showed significant effects on company performance across a variety of sub-models.

[911] Own illustration.

Table 28 summarizes these findings. The effects of control in the general model are presented on the left; the various sub-models are presented to the right.

Comparison of indirect controls across models									
		Company age		Company size		Life cycle stage		Management exp.	
	Full model	≤ 12 ys.	> 12 ys.	Small	Large	Early	Late	Small	Large
Personnel control (PC)	0,25 ***	0,35 **	0,36 ***	0,23 †	0,22 *	0,47 ***	0,32 ***	0,14	0,29 **
Cultural control (CC)	0,22 ***	0,18 *	0,30 **	0,11 †	0,34 **	0,40 ***	0,17 **	0,34 ***	0,28 **
Coeff. of determ. (R^2)	17,1%	22,1%	27,2%	27,0%	23,3%	52,7%	15,3%	32,3%	22,8%
Sample size	295	145	150	142	140	85	186	145	144
Significance † = 0.15; * = 0.1; **=0.05; ***=0.01 (one tailed)									

Table 28: Summary of moderating effects on indirect control effectiveness[912]

The analysis of the path coefficients across the sub-models reveals that the indirect control forms have a positive performance effect throughout all (17 out of 18 path coefficients is immensely significant) models. While being positive in the various models, their strength ranges from a minimum of 0.11 up to 0.47 (personnel control in the early life cycle stages). Although the path coefficients cannot directly be compared with another due to the rather exploratory nature of the PLS algorithm, the results still demonstrate a strong consistent effect. Out of the 18 path coefficients, 14 path coefficients (78%) are considered to be "strong" and impact company performance substantially.[913] As a result, this study is able to provide empirical evidence for the assumption that personnel and cultural control are stable and reliable success factors across a variety of contingent factors and should be applied in various settings.

In essence, this study reveals that indirect control is in fact a highly relevant management tool for both entrepreneurs and owner/managers of established SMEs. Indirect control is, therefore, suggested to be applied in start-ups as well as in established SMEs. In the context of entrepreneurial eduction, management control and specifically indirect control appears to be a valuable concept to present to students that actually supports organizations throughout their whole life cycle.

This study found ambiguous results on the nature of control. Despite an increase of variance explained in the sub-models building on contingent factors, the effectiveness of the control forms is impacted only to a minor extent. Based on the findings in this study, management control is considered to be rather of a universal nature with minor adjustments, especially in the light of the indirect control performance effect dominance. In the first moment, the review of the confirmed hypotheses for moderators might seem "disappointing." However, the findings actually suggest the important finding of the rather universal nature of management controls and the superiority of indirect controls.

912 Own illustration.
913 Building on the threshold of Chin (1998b), p. XIII.

8.2.4 Evaluation of company age as a contingent factor

This chapter specifically reviews the results on company age as a moderator in more depth. Although the overall contingent nature of moderators was discussed in the previous chapter, the moderator company age is of specific importance especially for the management control research in SMEs. As previous research on young SMEs builds on the assumption of an actual difference between young and established SMEs in regard to their MCS, the findings of this study require a further discussion.

Two key observations emerge from this study in regard to the factor of company age: first, the absence of a difference between young and established SMEs; second, an observed decrease of direct control usage with company age. Both aspects are discussed further in this section.

Control differences between young and established SMEs. In addition to the discussion of company age as a moderator in general, this section focuses on the consequences of the absent age effect in regard to previous research. Other academics previously provided evidence for differences between young and established organizations. The consequences are discussed and an integration of both findings is presented.

This study found no significant difference between the control's effectivness in young and established organizations. The effectiveness of the four management control forms does not show any significant variation in relation to the moderator age. However, previous researchers suggest an alternative approach of management control in young organizations, driven by either the lack of resources, level of informality or simply the role of the founder.[914] At first, these findings might seem like a contradiction. However, this study argues that both findings can be integrated and put into an overall perspective.

The results of both approaches differ in their conceptual core. Previous researchers gathered empirical evidence on the emergence of control in startup firms.[915] DAVILA/FOSTER aim to understand how the adoption and the introduction of these systems impact organizational reality. The dichotomous approach of previous research asked if and when the organizations adopted specific forms of control; however, this study asked in which intensity controls are used and if this has an impact on company performance. Hence each type of studies has an alternative focus. The adoption perspective gathers information on the question "when" organizations should implement management controls, while this study asks "how much" control they should integrate. Summarizing the current state of knowledge on young firms, the research concludes that an earlier introduction, matching to the contingencies of the

[914] Cf. for example Moores/Yuen (2001), pp. 352-353; Collier (2005), p. 325; Granlund/Taipaleenmaki (2005), p. 22.
[915] Cf. Davila/Foster (2007), pp. 908-909.

organization or, for instance, corporate strategy, is beneficial for an organization. In addition, once management controls are implemented, an increased usage (at least of the indirect forms of control) is associated with a performance increase.

In essence, the previous findings on the adoption processes of management controls can be integrated to the results of this study. Previous researchers found that an early integration of controls is beneficial for the success of an organization. Complementing this, the results of this study indicate that an increased usage of controls (once being implemented) impacts company performance as well.

Decrease of direct control usage. However, as the analysis showed no moderating effect of company age on the performance effect, this study decided to extend the focus further: by taking the actual usage intensity of management controls into consideration, it aims at delivering additional insights into the application of MCS in SME. The combination of descriptive and causal analysis allows additional insights: the comparative analysis of the data demonstrates a substantial decrease of direct control usage with increasing age. The descriptive analysis reveals that the mean of the direct control construct values decreased significantly with increasing age. Figure 29 illustrates the analysis.

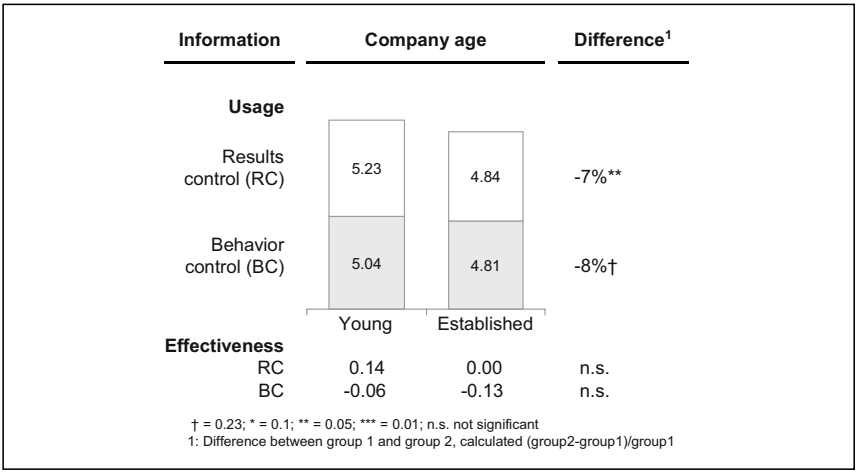

Figure 29: Summary of results on direct control intensity decrease[916]

This finding in relation to direct control usage is rather surprising, as previous research showed that management control techniques in organizations are adopted sequentially and

[916] Own illustration.

increasingly along their lifecycle. This study developed two feasible explanations to integrate the findings.

First, a methodological difference between the studies is expected to be responsible for the divergent findings. For instance, DAVILA/FOSTER (2007), in their recent work on the adoption effects of control techniques in young firms, investigated a set of up to 46 different tools and techniques and their adoption along time. They found that an earlier adoption of tools is also associated with a stronger company performance.[917] To investigate the adoption of control techniques, a list of potential control techniques was derived.[918] Alternatives range from rather "simple" tools like budgeting and incentive systems to rather "sophisticated" systems like company-wide newsletters or complex controlling calculations. The researchers investigate to find out which tools have been adopted at which point in the organizational history and how this relates to company performance. In contrast, this study employs the MERCHANT research framework which focuses on four alternative forms of control.[919] While comparing both approaches it becomes apparent that MERCHANT's framework rather builds on fundamental, yet highly relevant control techniques such as budgets, incentive payments, process reviews, HR recruiting/training techniques and cultural elements. In comparison to the set 46 control techniques from DAVILA/FOSTER, the four control forms from the MERCHANT framework do not cover all sophisticated control elements. Hence the control techniques covered in the items and the four constructs are of a rather "simple" nature and do not cover the full breadth of potential control techniques possible.[920] Despite the sophisticated techniques, researchers found that a set of basic controls is typically adopted earlier.[921] In line with theses findings, this study found that all four control forms are already implemented during the younger age of an SME, rather than at a later stage. Hence both studies are actually in line concerning the findings on basic control techniques. Only sophisticated control techniques are thus implemented at a later stage.

The second explanation is that the perceived relevance of direct controls for managers actually decreases with time. Each manager has a certain need for control based on the organization, the business model and his personal preferences. In order to achieve this level of control, he initiates a first MCS and builds on different tools to influence behavior. To address their demand for control, owners/managers are expected to include both direct and indirect controls in their MCS. As shown in the causal analysis, indirect controls demonstrate high

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917 Cf. Davila/Foster (2007), pp. 921-930.
918 Cf. Davila/Foster (2007), pp. 914-915.
919 Cf. Merchant/Stede (2003), p. 23 and 67.
920 Critics of the rather broad approach of DAVILA/FOSTER could argue that the control techniques included in the set of 46 techniques span far. The researchers also include alliance 'partnership monitoring systems' and 'partnership milestones' in their set of controls. Davila/Foster (2007), p. 915.
921 Cf. Sandino (2007), pp. 288-289.

effectiveness during the implementation and the owner/manager is expected to continue to use them further. Direct controls, however, show only a low degree of performance impact (direct control path coefficients in majority of models near 0.00[922]). Accordingly, the owner/manager seeks to reduce direct controls and compensates them with alternative forms of control. This study focused primarily on routines and processes as means to execute control; however, alternative tenchniques such as organizational structures or trust are known to influence employee behaviors.[923] Simultaneously to the decrease of direct controls, the owner/manager initiates the implementation of alternative forms and increasingly relies on them. Hence the reduction of direct controls is expected to be a replacement process with alternative forms of controls instead of an overall decrease in the usage of controls. This study favors the second explanation due its focus on learning and continuous professionalization of management activities.

In relation to the impact of age, two results emerge from this section. First, this study demonstrates that the effectiveness of management control does not change with the company age. As various other researchers emphasize the importance of adopting control systems in young organizations, this finding is rather surprising. However, the findings can be integrated into previous research by claiming that the earlier adaptation of controls is beneficial; however, the performance effect (the more you use it, the better) is of a universal nature and remains constant. Secondly, a descriptive analysis reveals that the use of direct controls decreases with increasing age and size. After a discussion of two competing explanations, this study assumes that this is a consequence of a shift towards alternative measures to achieve control such as trust or organizational barriers that were not part of this research framework.

8.2.5 Integration and overlap with other research areas

Finally, the results of this study have to be put into a more general perspective: several studies previously raise the general importance and relevance of HRM and corporate culture for SMEs.[924] The objective of this study is not to replace or undermine these previous findings but rather to provide empirical evidence for an alternative aspect of these functions: the control aspect. The findings of the data analysis in fact suggest this aspect of HRM and corporate culture, building on two considerations: first, the assumption that both research areas carry a control aspect is based on extensive theoretical (agency and social control theory) and conceptual (e.g. MERCHANT, DAVILA among others) findings; second, the overall model, including both indirect control forms, was able to explain 17.1% of the overall company performance variance. Both associated control forms showed a strong effect on

[922] Results control is an exception in the young SMEs sub-sample with a path coefficient of 0.14.
[923] For propositions on further research refer to Chapter 8.3.2.
[924] For a summary refer to 4.1.3 and 4.1.4.

company performance in the general model. In essence, this study indicates that both HRM and corporate culture in fact transmit the function of control in addition to their primary objectives. The consequences of this insight for both research areas are discussed in the following chapter in depth (Chapter 8.3.1). Hence, the goal of this study to complement the traditional view on control with adjacent fields of management research was achieved.

8.3 Research implications

After summarizing the findings of the empirical analysis, the study's contribution to research is summarized (Chapter 8.3.1) followed by a discussion of the limitations (Chapter 8.3.2).

8.3.1 Contribution to research

This study makes valuable contributions to different fields of research. Specifically, it makes a contribution to the three perspectives of control concepts, theory and methodology.

8.3.1.1 Conceptual perspective

Performance effect of indirect control forms. The detailed findings of the individual control forms were discussed in the previous chapter. This section discusses the academic findings of indirect controls and their performance effect, control combination outcomes, new insight into the underlying concepts of indirect controls, potential future research directions and the consequences for adjacent areas of management research.

First, at the most fundamental level, this study was able to provide evidence for the assumption that an increase in indirect controls has an impact on the performance of an SME. The assumed low level of formality within SMEs allowed the researcher to study the effects of indirect controls in SMEs.[925] As showed in the previous section, the contribution of the indirect controls to the company performance was significant. Although indirect controls are typically not considered a management tool to enforce implementation, both indirect control approaches exhibit strong relevance.[926] This finding is a key contribution of this study, as it has not been shown until today. In particular, the findings extend previous research, indicating an impact of management control adoption in SMEs on organizational effectiveness.[927] However, one has to consider that the duration of implementation is not comparable to rather

[925] Cf. Amat et al. (1994), pp. 118-120; Granlund/Taipaleenmaki (2005), pp. 46-48; Collier (2005), pp. 331-334.

[926] Although previous research yielded the relevance and frequent adoption of indirect controls in SMEs, no other study has provided the performance consequences of an increased use till date. Cf. Amat et al. (1994), pp. 118-120; Granlund/Taipaleenmaki (2005), pp. 46-48; Collier (2005), pp. 331-334.

[927] Cf. Davila/Foster (2007); Sandino (2007).

short-term focused results or behavior controls. The development of respective recruiting procedures including required skill sets, behavioral assumptions and development processes, requires time and implementation effort. In the same sense, the communication of norms and values, the design of organizational artefacts and development of group incentives cannot be implemented as fast as direct controls. Hence, due to these restrictions of indirect controls, the study assumes that direct control remains important and that they will still be used simultaneously.[928]

In addition to the findings above, the results also confirm significantly older research from the Hawthorne experiments.[929] During the experiments researchers were able to observe how norms and values developed by the group influenced the output of the group. Although the management set standards for the output required, the group itself developed standards on which level of performance was desirable. Then, the standards were enforced and applied to all members of the group.[930] Hence the results of the present study suggest a similar conesquence: in case managers are able to influence these norms and values they are able to exercise management control over their employees.

Secondly, control combinations were found to be highly beneficial for the performance in SMEs. Previous research yielded similar results for the field of sales and marketing in large organizations. The combination of different control tools and techniques is able to transmit information at different levels and to gather information on several dimensions. This study contributes in two points to the conceptual development of the field of control combinations.

- The findings on control combinations and the application to a new research environment (general management) contribute significantly to the conceptual development of the field. Till now, the concept of control combinations was focused on the field of sales & marketing. Sales & marketing personnel are typically externally oriented, intensely motivated by revenues and less concerned with administrative responsibilities. As such, a significant difference in the management style in comparison to general managers or members of the top-management team can be assumed. Consequently, the findings on control combinations were not expected to be easily transferable to the field of general management. By extending the concept to the field of general management, this study significantly extends the scope and increases the potential impact for management. The fact that only two studies have so far covered this topic from a sales & marketing point of view provides promising ground for future research. Further research could build on the findings of this study and

[928] In addition, previous authors provided strong evidence for the beneficial effect of direct controls. Refer also to Chapter 4.1.
[929] Cf. Roethlisberger/Dickson (1939), p. 19.
[930] Cf. Steinmann/Schreyögg (2005), pp. 60-62.

elaborate further, about how control combinations affect company performance in other functional areas of SMEs (e.g. research & development, manufacturing operations or general & accounting) and investigate potential interactions of control forms in these areas. Contrary to the feeling of interviewed SME-managers that too much control could be dysfunctional for an organization, this study found that the combination of high forms of direct and indirect control easily leads to an increased level of company performance. Consistent with the findings of the overall model, indirect forms of control contributed significantly to the overall effectiveness of MCS. Without the application of personnel and cultural control, an MCS within SMEs is not likely to succeed.

- However, the finding of a (insignificant) difference between clan control and high control is not addressed in the studies by JAWORSKI ET AL. (1993) and CRAVENS ET AL. (2004), who focused solely on the performance consequence of high control. Although CRAVENS ET AL. report similar findings ("for example, high and clan and bureaucratic control are not significantly different for performance in the median-split groups."[931]) they do not catch up further on this finding as it is assumed it to be a methodological artefact.[932] Further research is required to replicate the findings on control combinations and determine if potentially the clan control is more favorable than the high control combination.

Thirdly, the results reveal an alternative aspect of the underlying concepts of personnel (HRM) and cultural (corporate culture) control. The findings of this study suggest that HRM and corporate culture also bear an alternative function: the function of influencing employee behavior in a goal oriented way. Although HRM and corporate culture are considered relevant parts of an overall organization, they are typically not conceptually associated with operational management. In fact, this study shows that HRM and corporate culture are highly relevant to the day-to-day managerial work and provide managers with alternative techniques to influence employees' behavior. Chances are that these findings in fact raise the attention on both topics by providing an indication on the actual value of HRM and corporate culture.

Fourthly, this study is able to provide further recommendations on potential future research in the field of indirect controls:

- Future research is necessary to understand the control component of HRM more in detail: for example, the question which specific sub-functions of personnel control (e.g. recruiting processes, feedback, development or training) contribute more significantly to the overall concept of personnel control could be a promising next step for future research. Further efforts are also required to understand the personnel

[931] Cf. Cravens et al. (2004a), p. 246.
[932] Cf. Cravens et al. (2004a), p. 246.

control approach of SMEs. As a consequence of the low resource level, SMEs are not able to implement similar personnel control systems as large organizations. Hence, research needs to determine how SMEs can identify the required human resources (students, recent graduates or young professionals), how they can be attracted (e.g. recruiting networks, cooperation between young firms or practical projects with universities) and if there are specific requirements for HR development in SMEs.[933] Although these topics are typically subsumed under the overall topic of HRM in SMEs, they are also highly relevant for the application of control, as they contribute to the concept of personnel control.

- Increasing the knowledge on the effective implementation of cultural controls is another promising avenue for management research. Currently, different management tools or techniques (for example, the active communication of values or managers' behavior as a role model) exist; however, there is no knowledge about which of them is actually the most effective one. This approach could help to demystify the concept of cultural controls and support managers in implementing the respective control techniques. Despite the strong relevance of these performance impact findings of cultural control for practitioners, the topic of cultural controls also addresses an interesting conceptual overlap of organizational behavior, management research and psychology research. Cultural control could be an interesting research area for an interdisciplinary team of researchers to study organizational behavior and social processes within SMEs.

Finally, the results shed light on two relevant *adjacent fields of management research*:

- This study's findings also contribute to another research topic, the management of managers. This research stream deals specifically with the question how firms "establish, protect, renew and derive value from their senior managerial resources."[934] Top management teams were found to be highly important for the formulation and implementation of, for instance, turnaround strategies.[935] As this study used the top-management board of SMEs to explore the effectiveness of management control forms, results can be considered to contribute as well to the "management of managers" topic in an SME context. Besides characteristics like team composition or managerial profiles,[936] control in top-management teams is a crucial question.[937] This study specifically delves deep into the field of management control in these groups and suggests the application of two forms of management control (personnel and cultural control) in order to ensure goal-oriented managerial behavior.

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933 For a recent example on research in this direction refer to Leung (2003).
934 Boxall/Gilbert (2007), pp. 95-96.
935 Cf. Lohrke et al. (2004), pp. 83-84.
936 Cf. Norburn/Birley (1988), pp. 235.
937 Cf. Boxall/Gilbert (2007), p. 109.

- Finally, the results shed light on the field of strategic management. While strategy literature is concerned typically with strategy development, adjustments and the competitive environment, strategy implementation has received relatively little attention in the academic field.[938] However, implementation processes and the alignment of organizational resources are crucial for the success of a developed strategy. Otherwise the desired outcomes are unlikely to turn into reality. In management practice, strategy implementation typically follows a two step process. Strategy is first broken down into a plan with specific actions that are then executed by the respective managers. Crucial for the execution efforts are the controls that ensure the respective implementation efforts.[939] ANTHONY already addressed this issue in his description of the three fundamental forms of controls in organizations.[940] Strategic control decides and evaluates "the goals of the organization, and the formulation or reformulation of broad strategies to be used in attaining these goals."[941] Management control "is the process in which management ensures that the organization carries out its strategy."[942] Ensuring that specific tasks are carried out effectively is the concept of task control.[943] Management control, in the sense that it influences employee's behavior, is, therefore, highly relevant for strategic management.[944] It ensures the actual implementation of strategy and, therefore, is a relevant factor for strategic management as well. The findings of this study specifically guide researchers to (i) engage in further research on strategy implementation methods including its integration into operational management and (ii) to investigate the effects of HR systems and cultural components on strategy implementation success.

Integration into the overall field of management control research. The findings of this study are in line with previous findings and can be integrated into the recent developments of management control research. This study was able to confirm previous findings of, for example, BRETTEL ET AL. (2006) that management control in fact has a significant impact on the success of young firms by directing employee behavior.[945] In the same sense, the impact of the effect observed, represented by the amount of variance explained, is comparable across different studies that cover control issues in SMEs.[946] The positive effect of personnel and

938 For a review on the status of strategy implementation research, refer also to Noble (1999), p. 119.
939 Cf. Noble (1999), p. 120.
940 For a discussion of the findings of Anthony refer also to Chapter 2.1.1.
941 Anthony et al. (1989), p. 11.
942 Anthony et al. (1989), p. 11.
943 Cf. Anthony et al. (1989), p. 11.
944 Cf. Jaeger/Baliga (1985), pp. 128-129.
945 Cf. Brettel et al. (2006), pp. 23-24.
946 See Chapter 7.1.2.

cultural management techniques on company performance, as previously shown in large organizations, could be validated by the empirical data as well.[947]

The results of this study can be integrated into the current literature as well. Outcomes of this study are particularly relevant to the field of management controls in Entrepreneurship. Previous research by DAVILA (2007) found that an early adoption of management control techniques is associated with an increased level of organizational performance. This study found that the level of application of indirect controls is associated also with increased performance levels. Hence, the two dimensions of "point in time of adoption" and "strength of adoption" in the context of an MCS implementation can be distinguished.[948] In essence, young organizations are urged to implement control forms as soon as possible (first dimension) and as much as possible (second dimension). Obviously the level of control implemented should be aligned with the level tolerated by the employees. In addition, the results on company age as a moderator suggests that the effectiveness of management control does not change with increasing age. Hence, once an MCS is implemented in a young firm, there is no need for any adjustments due to increasing age. The results also shed light on the overall field of entrepreneurship, the definition of research objects and methodological considerations of studies. The impact of these findings is discussed further in the next two chapters.

The results in relation to management control combinations can also be integrated into previous findings. Previous researchers found a similar positive impact of high control combinations in the field of sales and marketing.[949] The findings of this study indicate that high management control combinations are beneficial when applied to the field of general management. One might speculate that a potential reason for this transferability of concepts are similar requirements towards managers in relation to outcome measurability, level of independence and level of predictability of activities. With this finding of transferability, this study is able to make a particular contribution to research, as the field of control combinations has previously focused solely on sales & marketing. Further research is required to validate the findings in the light of an alternative data set.

8.3.1.2 Theoretical perspective

Frameworks employed. This study employed agency and social control theory to describe the effects of control. Agency theory was previously used in the field of management control as it describes the situation of delegation of tasks and the associated incentive mechanisms by

947 See Chapter 4.1.3.2 and 4.1.4.2.
948 For the discussion see Chapter 8.2.4.
949 See Chapter 4.2.2.

nature.[950] Hence, the application was expected to be appropriate for the framework of management control in this study as well. However, critics of the agency theory argue that it "ignores a good bit of the complexity of organizations."[951] To mitigate this disadvantage in relation to indirect controls, social control theory was used to complement agency theory. In addition to the social aspects, agency researchers enquire whether agency theory is empirically valid."[952]

This study also addresses the criticism that agency theory is "hardly subject to empirical test since it rarely tries to explain actual events."[953] During the application to the research issues, both theoretical frameworks provided relevant insight into the fundamental mechanisms of management control. Social control theory significantly enriched the understanding of group processes and dynamics in this study. In the opinion of the author, both theories were well suited to describe the behavioral impact management controls have on employee's behavior. Hence, the study's contribution to theory is twofold. First, the applicability of agency theory to the problem of management control could be confirmed again. In addition to that, this study provides another empirical indication that agency theory is in fact a means to describe actual events in organizations.[954] Secondly, the study showed that an integration of an alternative theory into agency theory allowed a significantly richer description of the observed phenomena.

In addition to the underlying theories, the management control framework, as proposed by MERCHANT, was used as a second framework to guide the empirical analysis. During initial discussions with SME managers, founders and pre-testers, it was easily accessible and was able to capture the full extent of the various control forms. Researchers like LANGFIELD-SMITH (1997) and BALDAUF ET AL. (2005) argue that control research previously suffered from inconsistent conceptualizations and varying frameworks.[955] LANGFIELD-SMITH (1997) adds that the "variation in the number and type of controls that have been researched makes it difficult to develop a coherent body of knowledge."[956,957] The successful application of the MERCHANT framework hence provides a theoretical contribution to the field of management control research, as it indicates the successful ability of the framework to serve as a conceptualization for further research. Further research is invited to apply the framework again and to build a cohesive body of knowledge around it.

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950 Cf. for example Hansch (2006), p. 71.
951 Eisenhardt (1989a), p. 71.
952 Eisenhardt (1989a), p. 58.
953 Perrow (1986), p. 224.
954 Specifically addressing the concern of Eisenhardt (1989) mentioned in the paragraph above.
955 Cf. Langfield-Smith (1997), p. 226; Baldauf et al. (2005), p. 7.
956 Langfield-Smith (1997), p. 226.
957 Aernoudts/De Heer (2008) however, found that this diversity decreased over time, especially in the research concerning the interplay between MCS and strategy (p. 22).

Contingent vs. universal nature of control. Previous researchers initiated a discussion on the nature of controls. While researchers like ARTHUR (1994) or HUSELID (1995) argue that management controls are of universal/best-practice nature,[958] other researchers like SNELL/YOUNDT (1995), YOUNDT ET AL. (1996) or CHANG/HUANG (2005) claim that the effectiveness of control is of a highly contingent nature.[959] This study contributes to this discussion by providing empirical evidence for control as a universal success factor. While comparing the basic management control model with the models incorporating contingent factors, 70% of the control form/contingent factor combinations were not impacted. At the same time, the results are somehow ambiguous: the universal/main-model explained 5% less variance than the worst contingency model. Despite this lower level of determination, at least indirect control forms are assumed to be of a universal nature. As outlined in Chapter 8.2, 95% of all indirect control path coefficients are significantly positive and nearly 80% even exhibit a "strong" effect. Hence the results of this study strongly suggest that at least indirect control forms can be considered a universal success factor.

Despite the general indication of control being a universal success factor, additional research on this topic is required. Especially a fit-relationship between contingent factors and the control forms employed would be a promising approach to understand the nature of control further. Future research could address this issue by increasing the number of contingencies analyzed to determine the impact on each individual control form and by introducing a variable of appropriateness into their research model.

8.3.1.3 Methodological perspective

Empirical analysis of young firms vs. established small firms. This study focused its research on the performance effect of indirect controls in SMEs. During the analysis of the moderator age, an important effect emerged. Despite the hypothesized difference of the performance effect between young and established organizations, no effect was found to be existent. Even further analysis, such as building different smaller sub-groups for comparison, yielded no alternative results: the performance effect of controls is in fact identical between young and established SMEs.

This finding is of specific importance for entrepreneurship research. Traditionally in this field, academics define their research objective building on incidents emerging from young firms, for example, to determine the performance impact of market orientation as it emerges from entrepreneurial venture.[960] Then, theoretical considerations are developed for the reason why

[958] Cf. Arthur (1994), p. 684; Huselid (1995), pp. 643-644.
[959] Cf. Snell/Youndt (1995), p. 711; Youndt et al. (1996), p. 837; Chang/Huang (2005), pp. 445-446.
[960] Cf. for example Kessell (2007), Chapter 2.2.4.

these aspects are highly relevant for young firms.[961] Empirical analysis is finally conducted using young firms as the population.[962] However, one may wonder how conclusions from these findings can be drawn, if empirical results have not been controlled for the effect of age. Independent of the applied age threshold, researchers should reconsider including established small enterprises in their studies to cope with this issue.

Despite this relevant methodological finding, certain effects such as the drivers of entrepreneurial activities or start-up team processes are restricted to young firms and hence cannot be researched in older organizations. However, a considerable number of management techniques or strategic approaches can be applied both in an entrepreneurial and a small organization setting. These techniques for both groups are subject for further empirical analysis to determine if an actual difference exists. In essence, further research should increasingly seek to determine the actual differences between relevant research objects also by empirical analysis instead of relying solely on theoretical considerations.

Combination of management techniques. This study considered the combinations of different control forms explicitly in its approach. The results illustrate that combinations of certain management controls were associated with a significant increase of organizational performance which would not have been revealed using the traditional linear approach of SEM.[963] Certain management concepts can only be implemented one at a time; for instance, only one strategic orientation can be implemented within an entity. Contrasting this, numerous managerial activities can be applied to an organization simultaneously: e.g. exploration and exploitation, utilizing different information sources for decision-making or a mix of different controlling concepts.[964] These archetypes and configurations of management techniques are of specific interest for research: firstly, addressing a problem from different angles allows the manager to gain a holistic view on the issue and secondly, utilizing different techniques simultaneously mitigates the associated disadvantages of the individual management techniques. Previous research yielded preliminary results in the area of sales and marketing.[965] However, extending the concept of combinations to other fields of management seems to be very promising.[966]

This study contributes to the field of management research by highlighting the relevance and importance of interaction effects between different management techniques. Further research

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961 Cf. for example Goedecke (2007), Chapter 4.3.2.1.

962 Cf. for example Hiddemann (2007), Chapter 6.

963 In this sense, the approach to investigate combinations is also conceptually linked to configurational research. Cf. Dess et al. (1993).

964 For an example of the simultaneous application of exploration and exploitation techniques see Schulze et al. (2008).

965 Cf. Baldauf et al. (2005), p. 22.

966 Despite the relevance, spillover effects from sales and marketing were rather limited.

in the field of entrepreneurship and small business management should extend knowledge in this area further and address interaction effects in a more elaborate way.

8.3.2 Limitations of this study and directions for further research

This chapter discusses the constraints of the present study and proposes related research opportunities. Issues in relation to the choice of methodology are discussed, followed by conceptual propositions for further research.

8.3.2.1 Methodological limitations

From a *methodological point* of view, the study has to point out that the findings are based on single informants and subjective perceptions of the studied variables. Clearly, these are potentially subject to cognitive biases. Using multiple informants per firm and/or more objective criteria, might have solved this issue but it was not favorable in terms of its survey data acquisition costs. The cross-sectional approach of this study poses three other limitations of this study. Firstly, the findings are focused on the *current control configuration* within the organizations.[967] There is a potential time delay between the implementation of management controls and its full performance effect. The study is, therefore, not able to detect, if an organization recently changed its management control configuration from a low-control to a high-control combination and yet did not detect the beneficial performance effect of this decision. However, besides this theoretical consideration of this issue, the effect on the findings is expected to be of minor extent: the beneficial effects of results and behavior control are expected to take immediate effect, as the employees are influenced in their organizational behavior right away. The effects of personnel and cultural control, on the other hand, are expected to be implemented with a certain time lag, due to their effect mechanism of influencing the human capital and its norms and values. However, in comparison to the implementation of other management techniques (such as a reorientation towards quality leadership in an industry as a corporate strategy) control effects are assumed to be observed in a rather timely manner. The issue of this static research setting, therefore, is expected to be moderate. Further research could investigate the dynamic performance effects by employing a longitudinal analysis to the same dataset by using multiple survey waves.

Secondly, due to the nature of a cross-sectional survey, it does not encompass companies that *terminated their business activities* and their management control usage patterns.[968] Hence, this results in a potential survivorship bias in the data. The survival of companies in this case cannot be explained by the means of management control but the findings can rather be used

[967] Cf. Müller (2008), p. 227.
[968] Cf. for example Brown et al. (1992).

to explain the performance differences amongst SMEs. As this study was not structured as a survival-failure study, but rather aimed at helping SMEs to improve, the potential survivor bias is considered only as a minor threat to the generalizability of the findings. A potential approach to cope with this issue is the usage of case-studies of failed ventures and the comparison of their MCSs with the findings of this study.

Thirdly, this study assumes a *linear causal relationship* between control systems and company performance. However, from a theoretical point of view, there might also be an optimal level of control where the positive effects of control (e.g. motivation, communication of targets) and the negative effects (e.g. de-motivation and restriction of entrepreneurial spirit) reach equilibrium. This study tested the linearity of the relationships in the dataset and found no empirical evidence for this relation.[969] However, further research could try to fit different relationship functions (e.g. cubic, logarithmic) to empirical data and increase the effect model relationship knowledge.

Fourthly, it is necessary to acknowledge another limitation of cross-sectional based survey research, namely, that such a study design does not permit to prove *causal relationships* and that it only allows showing an association between constructs.[970] Nevertheless, this study argues that previous research on management controls and the applied theoretical frameworks indicate the causality of the use of increased management control forms with an increased company performance in SMEs. On the one hand, theoretical considerations about a direction of causality from the control forms to company performance stem from various frameworks, such as the agency theory. On the other hand, this study shows the association of certain control forms with strong performance. Without being comprehensively evident, this combination of findings gives a strong indication for an existent direction of causality.

In the case of this study and its rather small SEM, causal relationship is closely connected with the issue of *endogeneity*. This term refers to the situation where a structural model includes an endogenous variable that is actually explanatory.[971] The overall issue is gaining increasing interest in management research, due to its importance for the majority of

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969 For an overview of the results, refer to table Table 43. After eliminating outliers, the construct values were tested on the assumed linear relationship with performance. The results suggest that a linear relationship in fact exists between the four control forms and performance. The use of alternative shaped relationships (logarithmic, quadratic, cubic) improve the models only marginally (maximum difference between models ΔR^2_{max} 0.8%).

970 The method of SME does not allow for any causal statements. However, the direction of causality can only be determined using an underlying theoretical foundation. Cf. Homburg/Hildebrandt (1998), p. 17; Heinemann (2007), p. 241.

971 Cf. Chenhall/Moers (2007), p. 177.

empirical studies.[972] In the case of the present research model, a potential endogeneity is present as the endogenous variable "company performance" which potentially affects the design and usage of management control forms in the organization. As the control forms and the company performance in this study are the only constructs, the issues of endogeneity and causal relationships overlap. However, from a conceptual point of perspective they differ in another respect as well. A short example illustrates this issue: instead of improving company performance, personnel control could also be influenced, in its turn, by the performance. Hypothetically, a successful SME could decide to increase the rather costly function of behavior control. However, as this study builds on an established control framework and theoretical foundations that suggest an effect of management control on performance, the impact of endogeneity on this study is considered to be rather low.

8.3.2.2 Conceptual limitations

Besides the limitations resulting from the choice of the research methodology, this study is exposed to certain conceptual limitations too. Firstly, the results are subject to a potential *national culture bias* as the study was conducted in the environment of German SMEs.[973] In order to reduce this effect, empirical evidence from different national cultures would be necessary. A potential outcome could be a difference in the performance effect of indirect control forms over direct controls, as cultures with a lower level of collectivism potentially overpronounce direct control forms.[974] Preliminary results from other control scholars show an effect of culture on the design of MCSs and hence this stream should be analyzed further. Further considerations for conducting cross-cultural research on MCS can be found in the review of HARRISON/MCKINNON (1999) or the recent control review on MCS of CHENHALL (2003).[975]

Secondly, this study focused on managerial behavior and actions as a means to implement management control in SMEs. However, *alternative forms of management control* are existent in SMEs as well. Research indicates, for example, the effects of organizational structure such as teams,[976] organizational trust[977] or even a specific controlling philosophy like EVA in the context of management control.[978] These alternative approaches have not yet

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[972] For reviews of the problem within strategic management, see Hamilton/Nickerson (2003) or marketing (Shugan (2004).

[973] Cf. Chenhall (2003), pp. 152-153.

[974] For a comparison of results and behavior control effects between Thailand, Indonesia and Germany, refer also to Engelen (2008), pp. 295-299; Brettel et al. (2008b), p. 105; Brettel et al. (2009), pp. 14-16.

[975] Cf. Harrison/McKinnon (1999); Chenhall (2003), p. 152.

[976] Cf. Hansch (2006), pp. 28-29.

[977] Cf. Sjurts (1998); Das/Teng (2001); Dirks/Ferrin (2001); Inkpen/Currall (2004).

[978] Cf. Otley (2003), p. 320.

fully found their way into the "traditional" management control research, which rather focuses on tools, techniques and best practices. In the opinion of the author, the integration of these alternative forms are a promising approach for further MCS research in SMEs.

Thirdly, one could argue that this study focused on management control only as *one factor influencing success* in SMEs. Numerous other factors such as market orientation, customer loyalty or innovativeness of products are also known to affect the success of SMEs. However, this study specifically aimed at understanding the performance effects of specific control forms and, therefore, is considered only a partial model of company success. In an attempt to build an overall model for company success in SMEs far more success factors are required to be taken into account; however, a respective model is expected to be exhaustive in terms of its exogenous variables and, therefore, extremely difficult to be implemented. The advantage of this approach is the detailed understanding of the effect of the patterns of specific control forms, their moderating effect and not the detailed understanding of the overall SME performance. Other studies already address the overall question of SME performance differences and this study distinguishes itself specifically by focusing on the aspect of MCS composition.

Finally, this study tested a number of moderators in relation to their effects on the performance effect of management control forms in SMEs. However, a potential next research step could be the identification of *relevant antecedents on management control* that lead towards the selection of one or another management control form. Or, in other words: "Which internal and external factors contribute most to the decision for one or the other control form in SMEs?" Certain variables (e.g. size or managerial experience) tested as moderators during this study were previously used as antecedents on management control; further studies should examine the role and influence of factors on the decision for MCSs in order to fully understand the impact on the design of management control and not only the impact on its performance effect.

8.4 Managerial implications

Besides the implications for academics and further research efforts, this study also puts forward some valuable recommendations to the owners-managers of SMEs. In addition to that, it also provides suggestions for other stakeholders like investors or VCs.

8.4.1 Implications for owners-managers of SMEs

Four key recommendations for owners-managers emerge from this study. The first one is that, on the most fundamental level, this study proves it worthwhile to devote particular attention to management controls. Although managers frequently refer to topics like strategy development or operational planning, they typically ignore the relevance of a successful

implementation of their plans. However, the "best-laid plans are worthless if they cannot be implemented successfully."[979] For young firms, control even exerts a stronger effect on organizational performance than the planning process.[980] Management control actually is a technique to address this issue and it ensures the implementation of developed plans. In addition, previous research suggests that management control assists in the utilization of the scarce resources and provides guidance for the employees to behave in the desired fashion, which is consistent with the organizational goals.

This study shows that approximately 20% of the overall success of a small organization can be attributed to the use of management controls. Devoting time and effort on a topic like management control is thus not merely a stylistic decision; it actually has its impact on the bottom line.[981]

The traditional axiom has been that less-rather-than-more works best in the context of controls. Using a large sample of approximately 300 CEOs in Germany, this study was able to show that "Less isn't always more when it comes to employees." In fact it shows that more-rather-than-less control initiatives have a positive effect on the overall performance of an SME. Two forms emerged from the research effort:

- Personnel control focuses on recruiting, developing and training employees to behave in a way that is consistent with the organizational goals. By selecting the employees and assisting them during their development, managers are able to direct them towards the desired behavior. The time invested upfront in a rigid personnel recruiting and selection process pays off later through liberated management capacities and less direct employee interaction. This finding emphasiszes the relevance of human resource management in SMEs and pronounces the control aspect of HRM. An immediate action for an SME could be the development of a new hire requirement scheme based on the required levels of autonomy, self-efficiency or the ability to handle conflicts. These requirements need then to be closely linked to a tightened interview and recruiting process. As a consequence, the control effort for the new employees is expected to decrease significantly. More specifically, the analysis of the factor structure[982] suggests that personnel control is driven primarily by two sub-functions. The first is a *well-suited recruiting process* (indicator PC5). The definition

[979] Simons (1994), p. ix.
[980] Cf. Hiddemann (2007), p. 152.
[981] Cf. Snell/Youndt (1995), p. 729.
[982] These implications are derived from formative constructs by analyzing the underlying indicator weighting structure. In essence, the factor structure determines which indicator contributes how much to the overall construct. Changes in factor structure indicate a change of relevance for the overall concept. Hence, absolute and relative differences can be taken into consideration to analyze the relevance of specific management control concepts (for an example see Engelen (2008), pp. 324-326).

and adoption of a dedicated hiring process enables SMEs to increase the transparency of the overall recruiting process and to professionalize it. By introducing a specific interview process, by establishing an organizational structure with individual responsibilities, and by implementing interview documentation, the organization is able to increase the overall level of process stability and could organize their recruiting process just as professionally as other highly relevant business processes (for instance, manufacturing or strategic planning processes). Secondly, the in-depth analysis of the factor weighting structure demonstrates that an increased use of *training and development of personnel* (indicator PC6) is also associated with superior company performance in SMEs. Training and structured development offer the opportunity to interact with employees and alter traditional behavior structures. These behavioral changes can be used to influence employee behavior in the interest of the organization (for example, a training on open innovation techniques could be used to implement the strategy of customer orientation within an organization). However, managers have to actually use trainings to their advantage: traditionally, training and development efforts are only loosely coupled with the actual daily managerial work and implementation efforts.[983] Hence, a certain level of proficiency in the selection, training and integration of the individual's learnings into the operational work is required. Training and development, thus, should not be considered only a requirement to be fulfilled due to the request of the HR department, but rather a tool to increase the efficiency of operational work in the SMEs.

- Cultural control utilizes norms and values to alter behavior. By explicitly communicating and behaving along defined norms and values (that are designed to be aligned with overall planned goals), employees can in fact be influenced and engaged in socialization processes. Managers can utilize this form of control by shaping their communication and behavior even more strongly in alignment with their overall strategies. An interesting proposition was made by an interviewee during the initial discussions with SME CEOs: to implement the desired market orientation in his organization, the CEO frequently addresses e-mails to his employees summarizing discussions and key requirements of new customers. In the opinion of the interviewee this significantly directed employee behavior by leading-by-role model and fostering goal consistent behavior among the employees.

During the upcoming implementation of an operational plan or a new business strategy, readers are encouraged to take an alternative perspective: instead of solely defining the activities and related responsibilities, managers are urged to investigate which personnel and cultural dimensions are affected by this implementation. Then, measures on these two

[983] Cf. e.g., Banks et al. (1987).

alternative dimensions should be defined and integrated into the overall implementation process. This study suggests that an increased use of personnel and cultural controls is associated with a superior company performance. Hence, the increased application of both techniques is favorable to direct the behavior of employees.

The second major suggestion is that the proposed paradigm of "more-rather-than-less control" does also apply to the combination of controls. As managers typically apply different control mechanisms in parallel, it is worthwhile to investigate combinations as well. This study shows that the combination of both direct and indirect controls is especially favorable.[984] Choosing only one particular control form will not be as beneficial as combining different forms in order to address different ways of behavior influence. Companies that used high levels of direct and indirect control forms showed a significant higher success in comparison to organizations which used other combinations. Personnel and cultural control in a high control system serve as a basis for successful control activities, which are then complemented by results and behavior control. Organizations primarily relying on the "traditional" approach of introducing only direct control forms (for example, budgets or process reviews) thus lack a significant aspect of control. Consequently, based on the findings of this study, SMEs are urged to develop an MCS consisting of all available control forms in order to provide guidance from different perspectives and finally to perform excellently.

The third recommendation is that one can derive suggestions on the avoidance of specific management control tools.[985] The relevance of the following indicators changed significantly when certain lifecycle-oriented criteria changed.[986] With increasing age, the *number of job interviews* (PC2) is gaining increasing impact on company performance. Although relevant from the start, the effectiveness increases with company age. One might speculate that an increase of interview activity is of superior effectiveness for the SME, in case the SME is able to gather experience in conducting interviews and derive effective findings from these multiple interviews. Similarily, the *relevance of feedback processes* (RC4) increases with the

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[984] For a practitioner oriented description of control combinations, refer also to Cravens et al. (2004b).

[985] These implications are derived from formative constructs by analyzing the underlying indicator weighting structure. In essence, the factor structure determines which indicator contributes how strongly to the overall construct. Changes in factor structure indicate a change of relevance for the overall concept. Hence, absolute and relative differences can be taken into consideration to analyze the relevance of specific management control concepts (for an example see Engelen (2008), pp. 324-326).

[986] More specifically, these findings are derived from the group comparisons: to understand potential differences in indicator effectiveness, the study compares the weight of all formative indicators between the groups. Whenever the weight of an indicator changes significantly (determined by the Chin t-Test), its meaning and relevance for the overall construct changes as well. Such a change indicates that the individual indicator contributes differently to the individual form of management control. Detailed information is provided in Appendix F, Table 31, Table 34, Table 37 and Table 40.

increasing age and size of an organization.[987] Although feedback can be expected to be beneficial for all SMEs, explicit feedback on target achievement of superior managers becomes even more effective when applied to larger and older organizations. In line with the number of job interviews, previous learning experiences on how to conduct feedback and on how to use it for management control are potential reasons for this finding. As a result of these findings, managers of SMEs are encouraged to increase the number of job interviews and implement explicit performance feedback processes, as both measures are expected to be highly relevant for all SMEs, but especially for larger and more mature SMEs. One the other hand, the *effectiveness of control conducted by the CEO* (indicator RC2) decreases with growing company age and lifecycle stage. Hence, control should specifically not be executed by the CEO in matured organizations. One might assume that during the intial stages of an organization, control is potentially relevant for the CEO to adopt and adjust business model or strategies. However, with growing size, the control effort and complexity increases so drastically that the CEO is not able to efficiently utilize it any more. To address this issue and to replace the CEO as the key control entity, alternative structures such as a performance management system or dedicated organizational resources could be implemented.

Finally, this study revealed that an MCS needs to be adjusted to the specific requirements (size, age, life cycle stage, management experience) of the organization. In essence, the more and the earlier an MCS is introduced, the better it will be for the performance of an SME.

8.4.2 Implications for venture capitalists and other stakeholders

As outlined before, management control proves to be one of the success factors for SMEs. Consequently, external stakeholders (financial institutions, investors or alliance partners) that are interested in ensuring top performance of associated organizations should encourage the top-management to implement a well-developed MCS, as this has proved to be a success factor for SMEs.

Traditionally, external stakeholders demand the implementation of other management techniques, such as intense business planning activities, prior to a cooperation and management reports or meetings during cooperation. Until recently, management controls were considered to be only an internal reporting tool, and, therefore, an administrative detail an external stakeholder would not engage in. However, based on the findings of this study, the author recommends to the investors to actively induce the use of a holistic MCS. Basic controls such as operating budgets, incentive systems or balanced scorecards are well established managerial concepts with a proven track record. By extending these controls with indirect

[987] It also increases with the corporate lifecycle by 0.5; however, the increase is not significant.

forms, organizations are able to increase their effectiveness of influencing employees' behavior significantly.

To support the decision makers of external stakeholders, this study proposes three key questions for external stakeholders concerning the implementation of an MCS:

- Does the organization use an extensive HR system covering recruiting, development and feedback processes and is the system linked to the overall targets of the organization as outlined in their strategic planning?
- Does the top-management team of the organization actively communicate norms and values of strategy related issues within the organization?[988] Does the owner-manager lead by example?
- Does the management team complement indirect control forms with the use of direct controls such as budgets or incentive systems? The combination is expected to be even more beneficial for influencing behavior and aligning to the human resources.

Questions like these could be utilized formally to assess the extent of management control present in an organization. In case the SMEs did not yet implement respective control techniques, the external stakeholder could then enforce the implementation of the relevant tools. Such a slight external pressure is expected to be beneficial for the successful implementation of an MCS. Despite the expected benefits of external initiation, the managements of the SMEs remain highly important for the breakdown and adaptation of an MCS, particularly because no external party could determine the relevant recruiting strategy for a specific organization.

[988] The term 'active' is understood in the sense that management members communicate the norms and values aligned with the overall corporate strategy by intention.

9 Appendix

9.1 (A) Cover letter

An die Unternehmensleitung
Frau Dr. Müller
Musterunternehmen AG

Sehr geehrte Frau Dr. Müller,

interessiert es Sie auch, wie man durch gute Mitarbeiterführung ein Unternehmen erfolgreicher machen kann? In einem Forschungsprojekt der RWTH Aachen untersuchen wir genau diese Fragestellung. Basierend auf einer bundesweiten Umfrage unter Führungskräften von mittelständischen Unternehmen möchten wir die Auswirkungen von Mitarbeiterführung auf den Unternehmenserfolg messen. Aus den Ergebnissen werden wir konkrete Handlungsempfehlungen für die Praxis ableiten, zu denen Sie auf Wunsch auch Zugang erhalten.

Aufgrund Ihrer Erfahrung in der Unternehmensleitung der Musterunternehmen AG bitten wir Sie, an der ca. 10-minütigen Online-Umfrage teilzunehmen und zum Gelingen dieser Studie beizutragen. Als Dankeschön für Ihre Teilnahme erhalten Sie auf Wunsch eine praxisorientierte Auswertung dieser Studie. Erfahren Sie von anderen erfolgreichen Unternehmen, wie diese Kontrolle und Vertrauen ausbalancieren.

Für die Teilnahme an der Befragung sowie weiterführende Informationen folgen Sie bitte diesem Link: http://www.unipark.de/uc/rwth_mitarbeiterfuehrung/?code=445KMOPD
Wir sichern Ihnen eine vertrauliche Behandlung aller Angaben zu und stehen Ihnen bei Rückfragen gerne jederzeit zur Verfügung.

Mit freundlichen Grüßen
Dipl.-Ing. Jens Hutzschenreuter und Prof. Dr. Malte Brettel

PS: Unter der Adresse www.win.rwth-aachen.de/mitarbeiter.pdf können Sie den Fragebogen auch als PDF-Dokument herunterladen und uns dann ausgefüllt per Fax zurücksenden.

RWTH Aachen
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52056 Aachen
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9.2 (B) Initial reminder

An die Unternehmensleitung
Frau Dr. Müller
Musterunternehmen AG

Sehr geehrte Frau Dr. Müller,

im September habe ich Sie um Unterstützung des Forschungsprojekts zum Einfluss von Mitarbeiterführung auf den Unternehmenserfolg gebeten. Bisher haben bereits zahlreiche Geschäftsführer an unserer Umfrage teilgenommen, so dass ich Ihnen als Dankeschön für Ihre Teilnahme eine praxisrelevante Auswertung der Studienergebnisse in Aussicht stellen kann.

Hiermit möchte ich Sie erneut bitten, an unserer Umfrage teilzunehmen, da Folgendes gilt: Je größer der Teilnehmerkreis, desto wertvoller und aussagekräftiger die Ergebnisse. Auch persönlich bin ich für Ihre Unterstützung sehr dankbar, da die Befragung ein zentraler Bestandteil meiner Doktorarbeit ist.

Zur komfortablen und schnellen Online-Umfrage gelangen Sie über folgenden Link:
http://www.unipark.de/uc/rwth_mitarbeiterfuehrung/?code=445KMOPD

Ich sichere Ihnen ausdrücklich eine strikt vertrauliche Behandlung Ihrer Daten zu. Für Rückfragen stehe ich Ihnen gerne jederzeit zur Verfügung. Vielen Dank im Voraus für Ihre Unterstützung!

Mit freundlichen Grüßen
Dipl.-Ing. Jens Hutzschenreuter

PS: Unter der Adresse www.win.rwth-aachen.de/mitarbeiter.pdf können Sie den Fragebogen auch als PDF-Dokument herunterladen und uns dann ausgefüllt per Fax zurücksenden.

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9.3 (C) Second reminder

An die Unternehmensleitung
Frau Dr. Müller
Musterunternehmen AG

Sehr geehrte Frau Dr. Müller,

vor einiger Zeit habe ich Sie um Unterstützung des Forschungsprojekts zum Einfluss von Mitarbeiterführung auf den Unternehmenserfolg gebeten.

Die Umfrage endet am 20. Oktober 2007. Für Ihre Teilnahme (Dauer ca. 10 Minuten) wäre ich sehr dankbar, da die Befragung einen wesentlichen Bestandteil meiner Doktorarbeit darstellt. Sollten Sie nicht teilnehmen wollen, bitte ich höflich, die erneute Anfrage zu entschuldigen. Weitere Zuschriften erhalten Sie nicht mehr.

Zur komfortablen und schnellen Online-Umfrage gelangen Sie über folgenden Link:

http://www.unipark.de/uc/rwth_mitarbeiterfuehrung/?code=445KMOPD

Ich sichere Ihnen ausdrücklich eine strikt vertrauliche Behandlung Ihrer Daten zu. Für Rückfragen stehe ich Ihnen gerne jederzeit zur Verfügung.
Herzlichen Dank für Ihr Verständnis und ganz besonders für Ihre Unterstützung.

Mit freundlichen Grüßen

Dipl.-Ing. Jens Hutzschenreuter

PS: Unter der Adresse www.win.rwth-aachen.de/mitarbeiter.pdf können Sie den Fragebogen auch als PDF-Dokument herunterladen und uns dann ausgefüllt per Fax zurücksenden.

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9.4 (D) Questionnaire

Erfolgsfaktor Mitarbeiterführung: Die Umfrage

Was wird erforscht?

Mit Ihrer Teilnahme unterstützen Sie ein wichtiges wissenschaftliches Forschungs- und Dissertationsprojekt der **Rheinisch-Westfälischen Technischen Hochschule Aachen** (RWTH Aachen):

Führung von Mitarbeitern:
Besonders in unruhigen Zeiten (z.B. Produktneueinführung oder Umstrukturierung) ist die konsequente Führung der eigenen Mitarbeiter einer der Erfolgsfaktoren.

Hinweis: Unter **Kontrolle** versteht man Methoden zur Kommunikation von Zielen und die Überprüfung der Zielerreichung der Mitarbeiter. Kontrolle wird dabei durch jede einzelne Führungskraft angewendet. In Abgrenzung dazu wird Controlling durch eine separate Abteilung oder Mitarbeiter durchgeführt.

Was haben Sie davon?

Sie profitieren von einer **praxisorientierten Auswertung dieser Untersuchung**, die konkrete Empfehlungen aus den Daten von vergleichbaren Unternehmen ableitet:

Erfahren Sie von anderen erfolgreichen Unternehmen, wie diese Kontrolle und Vertrauen balancieren, und **überprüfen** Sie damit ggf. den Umgang mit Ihren Mitarbeitern.

Was ist zu beachten?

- Bitte beantworten Sie die Fragen immer aus **Sicht der Geschäftsleitung**.
- Die Untersuchung ist in **vier Blöcke** gegliedert und erfordert etwa **10 Minuten** Zeit.
- Der Fragebogen enthält aus methodischen Gründen **teilweise ähnliche Fragen**. Wir bitten um Ihr Verständnis.
- Bitte lassen Sie keine Frage aus, auch wenn Ihnen die Antwort einmal schwer fällt. Ein guter **Schätzwert** ist wertvoller als ein unvollständiger Fragebogen.
- Alle von Ihnen bereitgestellten Informationen dienen **rein wissenschaftlichen Zwecken** und werden **streng vertraulich** behandelt (d.h. keine Veröffentlichung von Informationen, die Rückschlüsse auf individuelle Unternehmen erlauben).

Wen kann ich ansprechen?

Bei **Rückfragen** können Sie sich gerne jederzeit an den zuständigen Doktoranden wenden:

Dipl.-Ing. Jens Hutzschenreuter
E-Mail:
jens.hutzschenreuter@rwth-aachen.de
Internet:
www.win.rwth-aachen.de/hutzschenreuter
Telefax: 0241/80 92371

Informationen über den **RWTH-Universitäts-Lehrstuhl** Wirtschaftswissenschaften für Ingenieure und Naturwissenschaftler (**WIN**) und die bisherigen Forschungsprojekte zu Unternehmensgründung und Unternehmertum erhalten Sie unter www.win.rwth-aachen.de.

Vielen Dank im Voraus für Ihre Unterstützung!

Teil I: Kontrolle

I.1. Ergebniskontrolle

Bitte geben Sie an, inwieweit die folgenden Aussagen auf Ihre direkten Mitarbeiter zutreffen:	Trifft gar nicht zu						Trifft voll zu
Für die einzelnen **Mitarbeiter** werden **individuelle Ziele** gesetzt.	☐1	☐2	☐3	☐4	☐5	☐6	☐7
Die **Ziele** meiner Mitarbeiter werden von mir **kontrolliert**.	☐1	☐2	☐3	☐4	☐5	☐6	☐7
Zielabweichungen müssen von dem jeweiligen Mitarbeiter **erläutert** werden.	☐1	☐2	☐3	☐4	☐5	☐6	☐7
Meine Mitarbeiter erhalten nach **Abschluss von Projekten/Aufgaben** von mir **Feedback** zu ihrem **Zielerfüllungsgrad**.	☐1	☐2	☐3	☐4	☐5	☐6	☐7
Gehaltssteigerungen und Bonuszahlungen (sowie sonstige Vergünstigungen) meiner Mitarbeiter sind an Ihre **Zielerfüllung gekoppelt**.	☐1	☐2	☐3	☐4	☐5	☐6	☐7
Meine Mitarbeiter müssen sich hauptsächlich an ihren **Arbeits-/Projektergebnissen messen** lassen.	☐1	☐2	☐3	☐4	☐5	☐6	☐7

I.2. Prozesskontrolle

Bitte geben Sie an, inwieweit die folgenden Aussagen auf Ihre direkten Mitarbeiter zutreffen:	Trifft gar nicht zu						Trifft voll zu
Meine Mitarbeiter diskutieren die notwendigen **Zwischenschritte zur Zielerreichung** mit mir.	☐1	☐2	☐3	☐4	☐5	☐6	☐7
Falls angestrebte **Ergebnisse ausbleiben**, diskutieren meine Mitarbeiter die **nächsten Schritte** mit mir.	☐1	☐2	☐3	☐4	☐5	☐6	☐7
Meinen Mitarbeitern ist **während Projekten** jederzeit klar, wo sie in der **Erreichung ihrer Ziele** stehen.	☐1	☐2	☐3	☐4	☐5	☐6	☐7
Meine Mitarbeiter und ich legen für **wiederkehrende Tätigkeiten** gemeinsam die **wichtigsten Zwischenschritte** fest.	☐1	☐2	☐3	☐4	☐5	☐6	☐7

I.3. Personelle Kontrolle

Ein zielgerichtetes Verhalten der Mitarbeiter kann auch durch eine sorgfältige Personalauswahl und -entwicklung sichergestellt werden. Bitte geben Sie an, inwieweit die folgenden Aussagen auf Ihr Unternehmen zutreffen:	Trifft gar nicht zu						Trifft voll zu
Unsere Bewerber durchlaufen eine **Reihe von Bewertungen und Bewerbungsgesprächen**, bevor sie eingestellt werden.	☐1	☐2	☐3	☐4	☐5	☐6	☐7
Unsere Bewerber erhalten zahlreiche Möglichkeiten, die **Bandbreite ihrer Fähigkeiten** zu zeigen.	☐1	☐2	☐3	☐4	☐5	☐6	☐7
Wir legen sehr großen Wert darauf, die **bestmöglichen Bewerber** für die jeweilige Position einzustellen.	☐1	☐2	☐3	☐4	☐5	☐6	☐7
Wir sehen eine große Notwendigkeit darin, **talentierte Mitarbeiter fortzubilden** und **weiterzuentwickeln**.	☐1	☐2	☐3	☐4	☐5	☐6	☐7
Wir haben große Anstrengungen unternommen, um den für unser Unternehmen **bestmöglichen Einstellungsprozess** zu etablieren.	☐1	☐2	☐3	☐4	☐5	☐6	☐7
Durch **geziele Personalauswahl und –förderung** stellen wir sicher, dass unsere Mitarbeiter zu uns **passen** und die **Ziele des Unternehmens** verstehen und **verfolgen**.	☐1	☐2	☐3	☐4	☐5	☐6	☐7

I.4. Kulturelle Kontrolle

Die Unternehmenskultur kann die Zielkontrolle ebenfalls ergänzen. Bitte geben Sie an, inwieweit die folgenden Aussagen auf Ihr Unternehmen zutreffen:	Trifft gar nicht zu						Trifft voll zu
Unsere Mitarbeiter sind bereit, sich **über das erwartete Maß hinaus einzusetzen**, um zum Erfolg unseres Unternehmens beizutragen.	☐1	☐2	☐3	☐4	☐5	☐6	☐7
Unsere Mitarbeiter empfinden eine **große Loyalität gegenüber unserem Unternehmen.**	☐1	☐2	☐3	☐4	☐5	☐6	☐7
Es besteht eine hohe **Übereinstimmung zwischen den Werten** unseres Unternehmens und den Werten der einzelnen Mitarbeiter.	☐1	☐2	☐3	☐4	☐5	☐6	☐7
Das **Schicksal** unseres Unternehmens **ist unseren Mitarbeitern** wichtig.	☐1	☐2	☐3	☐4	☐5	☐6	☐7
Unsere Mitarbeiter erzählen Freunden, dass **unser Unternehmen ein guter Arbeitgeber** ist.	☐1	☐2	☐3	☐4	☐5	☐6	☐7

Teil II: Allgemeine Angaben

II.1. Unternehmensphase

Ein Unternehmen durchläuft während seiner Entwicklung **verschiedene Phasen**. Bitte wählen Sie aus den folgenden Phasen diejenige aus, die am ehesten auf Ihr Unternehmen zutrifft. Bitte wählen Sie **nur eine Phase** aus:	
☐	**Start-up-Phase:** Der Schwerpunkt der derzeitigen Aktivitäten unseres Unternehmens liegt auf Produktentwicklung und -design, der Sicherung angemessener finanzieller Mittel sowie der Marktentwicklung.
☐	**Markteintrittsphase:** Unser Unternehmen hat ein erfolgreiches Produkt, für das am Markt eine Nachfrage besteht. Wir können bereits Aufträge und einigen Umsatz vorweisen. Wir sind in der Lage, unser Angebot herzustellen und zu verkaufen, aber unser Unternehmen muss noch fest am Markt etabliert werden.
☐	**Wachstumsphase:** Unser Unternehmen ist durch hohes Umsatzwachstum geprägt. Das Hauptaugenmerk liegt auf der Frage, wie unser Produkt in größerer Menge profitabel erstellt und vertrieben werden kann.
☐	**Konsolidierungsphase:** Wir wachsen weiterhin, aber unsere Wachstumsraten nähern sich langsam dem Marktniveau an. Die 2. oder 3. Generation unseres Produkts ist am Markt erfolgreich eingeführt oder steht kurz vor der Einführung. Wir beschäftigen uns auch intensiv mit der Frage, wie wir unser Geschäft profitabler gestalten und weiter ausbauen können.
☐	**Reifephase:** Der Schwerpunkt unserer Aktivitäten liegt auf der Diversifizierung unseres Geschäfts. Wir entwickeln weitere Produktgenerationen bzw. zusätzlich völlig neue Produktangebote. Darüber hinaus erschließen wir neue geografische Märkte.

II.2. Zufriedenheit mit der Entwicklung des Unternehmens

Bitte vervollständigen Sie die folgenden Aussagen bzgl. der Entwicklung Ihres Unternehmens:	sehr unzufrieden						sehr zufrieden
Mit der **wirtschaftlichen Entwicklung unseres Unternehmens** im Vergleich zu den wichtigsten Wettbewerbern sind wir…	☐1	☐2	☐3	☐4	☐5	☐6	☐7
Mit dem **Wachstum unseres Unternehmens** im Vergleich zu den wichtigsten Wettbewerbern sind wir…	☐1	☐2	☐3	☐4	☐5	☐6	☐7
Mit dem **prognostizierten Betriebsergebnis** für die nächsten Jahre sind wir…	☐1	☐2	☐3	☐4	☐5	☐6	☐7
Mit unserem **Erfolg unserer Produkte** relativ zu den wichtigsten Wettbewerbern sind wir…	☐1	☐2	☐3	☐4	☐5	☐6	☐7
Mit der Anzahl **neu gewonnener Endkunden** im Vergleich zu den wichtigsten Wettbewerbern sind wir…	☐1	☐2	☐3	☐4	☐5	☐6	☐7
Mit dem Ausmaß der **Bindung der Endkunden** an unser Unternehmen relativ zu den wichtigsten Wettbewerbern sind wir…	☐1	☐2	☐3	☐4	☐5	☐6	☐7
Mit dem **erreichten Marktanteil** im Vergleich zu den wichtigsten Wettbewerbern sind wir…	☐1	☐2	☐3	☐4	☐5	☐6	☐7

Teil III: Weitere Angaben

III.1. Allgemeine Angaben

Bitte machen Sie abschließend folgende wichtige Angaben zu Ihrem Unternehmen und der Geschäftsleitung:	
Unser Unternehmen wurde **gegründet** im Jahr:	_____ (JJJJ)
Der **Markteintritt** unseres Unternehmens erfolgte im Jahr:	_____ (JJJJ)
Die **Anzahl fester Mitarbeiter** beträgt aktuell: (in **Vollzeitstellen**, 20h/Woche = 0,5)	_____ (Anzahl fester Mitarbeiter in Vollzeitstellen)
Die **Gründung** unserer Gesellschaft erfolgte:	☐ Selbständig durch die Gründer ☐ Durch die Muttergesellschaft
Bei der **Gesellschaft** handelt es sich um eine:	☐ Neugründung ☐ Übernahme/Umgründung
Die **Eigenkapitalgeber** unseres Unternehmens sind: (Bitte kreuzen Sie sämtliche Eigenkapitalgeber an, die mehr als 10% Ihres Eigenkapitals ausmachen)	☐ Gründer ☐ Familie und Freunde ☐ Business Angels ☐ Venture-Capital-Gesellschaften (inkl. Private-Equity-Gesellschaften) ☐ Strategische Partner (z.B. Konzerne) ☐ Öffentliche Fördergesellschaften
Ich nehme in unserem Unternehmen folgende **Funktion** ein:	☐ Geschäftsleitung ☐ Leitende Position ☐ Mitarbeiter
Ich war bei der Unternehmensgründung als **(Mit-) Gründer** beteiligt:	☐ Ja ☐ Nein

Unsere Mitglieder der **Geschäftsführung** haben in Summe so viele **Jahre Erfahrung im Management** (1. oder 2. Führungsebene):	_____ (Anzahl Jahre kumulierter Erfahung im Management) _____ (Anzahl Mitglieder in der Geschäftsleitung)
Die Mitglieder der **Geschäftsführung** unserer Gesellschaft haben folgenden **Ausbildungshintergrund**: (Mehrfachantworten möglich; "Sonstige" bitte spezifizieren)	☐ Wirtschaftswissenschaftlich ☐ Naturwissenschaftlich/Technisch ☐ Sonstige _____
Unser Unternehmen gehört zu diesem **Gewerbe**:	☐ Produzierendes Gewerbe ☐ Dienstleistunggewerbe
Unser Unternehmen ist in **folgender Branche** angesiedelt:	☐ Automobilindustrie ☐ Bau/Immobilien ☐ Biotechnologie/Medizintechnik ☐ Chemie/Pharma ☐ Elektroindustrie ☐ Energie/Rohstoffe ☐ Financial Services (Banken, Versicherungen o.Ä.) ☐ Professional Services (Beratung, StB, WP o.Ä.) ☐ IT/Software/Internet ☐ Maschinenbau ☐ Medien ☐ Handel ☐ Telekommunikation ☐ Transport/Logistik ☐ Sonstiges

III.2. Unternehmenserfolg

Bitte ordnen Sie Ihr Unternehmen in die unten aufgeführten Kategorien ein:
(Zur Erinnerung: Ihre Angaben werden streng vertraulich behandelt und ausschließlich im Rahmen dieses wissenschaftlichen Projekts verwendet.)

Ungefähres **Wachstum** an **festen Mitarbeitern** im Vergleich zum **Vorjahr** (in %).	☐ ≤ 0	☐ < 20	☐ < 40	☐ < 80	☐ < 100	☐ < 200	☐ ≥ 200
Durchschnittliches **Wachstum** an **festen Mitarbeitern** pro Jahr **seit Gründung** (in %).	☐ ≤ 0	☐ < 20	☐ < 40	☐ < 60	☐ < 80	☐ < 100	☐ ≥ 100
Ungefährer **Umsatz** im **abgelaufenen Geschäftsjahr** (in Mio. Euro).	☐ ≤ 0,1	☐ < 1	☐ < 5	☐ < 10	☐ < 25	☐ < 50	☐ ≥ 50
Ungefähres **Umsatzwachstum** im Vergleich zum **Vorjahr** (in %).	☐ ≤ 0	☐ < 20	☐ < 40	☐ < 80	☐ < 100	☐ < 200	☐ ≥ 200
Durchschnittliches **Umsatzwachstum** pro Jahr **seit Gründung** (in %).	☐ ≤ 0	☐ < 20	☐ < 40	☐ < 60	☐ < 80	☐ < 100	☐ ≥ 100
Ungefähres **Ergebnis vor Steuern** im **abgelaufenen Geschäftsjahr** (in % des Umsatzes).	☐ ≤ 0	☐ < 5	☐ < 10	☐ < 15	☐ < 20	☐ < 30	☐ ≥ 30

Rückantwort per Fax oder Brief bitte an:

RWTH Aachen
Lehrstuhl Wirtschaftswissenschaften für
Ingenieure und Naturwissenschaftler (WIN)
z. Hd. Dipl.-Ing. Jens Hutzschenreuter
Templergraben 64

52056 Aachen

Telefax: 0241/80 92371

Optionaler Platz für Adressaufkleber/Firmenstempel

Stichwort: "Erfolgsfaktor Mitarbeiterführung: Die Umfrage"

Wenn Sie Interesse an der Auswertung der Studie " Erfolgsfaktor Mitarbeiterführung: Die Umfrage" haben, machen Sie bitte folgende Angaben: (Anmerkung: Diese Seite wird vor Auswertung der inhaltlichen Fragen vom Fragebogen getrennt.)	
Anrede des Ansprechpartners:	☐ Frau ☐ Herr
Name des Ansprechpartners:	_____
E-Mail-Adresse des Ansprechpartners:	_____
Fax-Nummer des Ansprechpartners (optional):	_____

Bitte senden Sie diese Seite zusammen mit den vorangegangenen Fragebogenseiten zurück.
✂----------

9.5 (F) Tables

Descriptive Analysis of data set (indicators)					
	No. of indicators	Mean	Standard deviation	Minimum	Maximum
RC1	7	5.04	1.68	1	7
RC2	7	5.20	1.64	1	7
RC3	7	4.99	1.75	1	7
RC4	7	4.96	1.70	1	7
RC5	7	4.30	2.05	1	7
BC1	7	4.89	1.61	1	7
BC2	7	5.28	1.44	1	7
BC3	7	4.60	1.48	1	7
BC4	7	4.69	1.63	1	7
PC1	7	4.66	1.99	1	7
PC2	7	4.44	1.68	1	7
PC3	7	5.94	1.16	1	7
PC4	7	5.84	1.29	1	7
PC5	7	4.25	1.72	1	7
CC1	7	5.77	1.11	1	7
CC2	7	5.85	1.09	1	7
CC3	7	5.32	1.19	1	7
CC4	7	5.90	1.14	1	7
CC5	7	5.58	1.11	1	7
PERF1	7	4.93	1.24	1	7
PERF2	7	4.88	1.30	1	7
PERF3	7	4.71	1.35	1	7
PERF4	7	5.23	1.12	1	7
PERF5	7	4.69	1.45	1	7
PERF6	7	5.37	1.36	1	7
PERF7	7	4.43	1.40	1	7

Table 29: Descriptive analysis of all indicators[989]

[989] Own illustration.

Missing data by indicator			
	N	Missing data (abs.)	Missing data (in %)
RC01	293	2	0.68%
RC2	295	0	0.00%
RC3	295	0	0.00%
RC4	295	0	0.00%
RC5	295	0	0.00%
BC1	295	0	0.00%
BC2	295	0	0.00%
BC3	295	0	0.00%
BC4	295	0	0.00%
PC1	295	0	0.00%
PC2	295	0	0.00%
PC3	294	1	0.34%
PC4	294	1	0.34%
PC5	294	1	0.34%
CC1	295	0	0.00%
CC2	294	1	0.34%
CC3	293	2	0.68%
CC4	295	0	0.00%
CC5	290	5	1.69%
PERF1	295	0	0.00%
PERF2	295	0	0.00%
PERF3	295	0	0.00%
PERF4	295	0	0.00%
PERF5	295	0	0.00%
PERF6	294	1	0.34%
PERF7	294	1	0.34%

Table 30: Overview of missing values by indicator[990]

[990] Own illustration.

Group comparison (Company age)								
	Group1 (=< 12 years)			Group2 (> 12 years)			Compa-rability	
	Loading	t-value		Loading	t-value		CoC	
Reflective measurement model								
Behavior control							0.99	
BC1	0.64	2.94		0.80	4.80		-	
BC2	0.82	4.51		0.86	6.00		-	
BC3	0.94	6.66		0.87	6.22		-	
BC4							-	eliminated
Cronb. α	0.79	-		0.80	-		-	
Int. Cons.	0.85	-		0.88	-		-	
AVE	0.65	-		0.71	-		-	
Cultural control							0.99	
CC1	0.84	10.70		0.83	19.45		-	
CC2	0.86	9.91		0.89	24.14		-	
CC3	0.91	16.74		0.89	21.65		-	
CC4	0.81	9.34		0.80	9.07		-	
CC5	0.89	16.22		0.84	15.50		-	
Cronb. α	0.92	-		0.91	-		-	
Int. Cons.	0.94	-		0.93	-		-	
AVE	0.74	-		0.73	-		-	
Discriminant analysis (see appendix)								
Construct	ok			ok			-	
Indicator	ok			ok			-	

	Weight	t-Value	VIF	Weight	t-Value	VIF	Weight Δ	
Formative measurement model								
Results control								
RC1	0.26	0.91	1.84	-0.26	0.82	2.19	-0.52	
RC2	0.77	2.22	2.06	-0.25	0.74	2.50	-1.03**	
RC3	0.39	1.37	2.05	0.49	1.40	2.99	0.11	
RC4	-0.78	2.25	1.90	0.45	1.39	2.07	1.23***	
RC5	0.23	1.03	1.34	0.60	2.22	1.59	0.37	
Cond. Index	14.81	-	-	13.90	-	-	-	
Personnel control								
PC1	-0.06	0.27	2.01	0.17	0.79	2.01	0.23	
PC2	-0.27	1.05	1.71	0.37	1.57	1.76	0.64*	
PC3	-0.16	0.84	1.44	0.09	0.39	1.64	0.26	
PC4	0.81	2.97	1.34	0.72	2.86	1.64	-0.1	
PC5	0.65	2.37	1.46	-0.10	0.40	2.07	-0.75*	
Cond. Index	19.36	-	-	18.98	-	-	-	

Structural model							
R2	22.7%			27.2%		-	
Q2	5.5%			8.7%		-	
Path coefficients	**Usage**	**Path coeff.**		**Usage**	**Path coeff.**	**Usage Diff.**	**PathC. Diff.**
RC	5.23	0.14		4.84	0.01	-0.39**	-0.13 (n.s.)
BC	5.04	-0.06		4.81	-0.13	-0.23†	0.13 (n.s.)
PC	5.03	0.35		5.01	0.36	-0.02 (n.s.)	0.02 (n.s.)
CC	5.76	0.18		5.59	0.30	-0.17 (n.s.)	-0.07 (n.s.)

n.a. = constructs not comparable (cf. weights diff. and CoC); Significance † = 0.23; * = 0.1; **=0.05; ***=0.01 (one sided)
n.s. = not significant

Table 31: Group comparison company age[991]

[991] Own illustration.

Group comparison (Company age)
Group1

Discriminant validity on indicator level					
	RC	**BC**	**PC**	**CC**	**PERF**
BC1	0.384	**0.794**	0.229	0.377	0.135
BC2	0.387	**0.839**	0.305	0.379	0.122
BC3	0.490	**0.879**	0.364	0.338	0.221
CC1	0.224	0.399	0.356	**0.844**	0.244
CC2	0.231	0.430	0.304	**0.891**	0.242
CC3	0.262	0.434	0.402	**0.902**	0.338
CC4	0.161	0.286	0.264	**0.814**	0.182
CC5	0.212	0.285	0.366	**0.855**	0.351

Discriminant validity on construct level					
	RC	**BC**	**PC**	**CC**	**PERF**
RC	n.a.				
BC	0.514	**0.838**			
PC	0.444	0.368	n.a.		
CC	0.258	0.426	0.403	**0.862**	
PERF	0.209	0.203	0.357	0.331	n.a.

Table 32: Discriminant validity – company age – group 1[992]

Group comparison (Company age)
Group2

Discriminant validity on indicator level					
	RC	**BC**	**PC**	**CC**	**PERF**
BC1	0.384	**0.794**	0.229	0.377	0.135
BC2	0.387	**0.839**	0.305	0.379	0.122
BC3	0.490	**0.879**	0.364	0.338	0.221
CC1	0.224	0.399	0.356	**0.844**	0.244
CC2	0.231	0.430	0.304	**0.891**	0.242
CC3	0.262	0.434	0.402	**0.902**	0.338
CC4	0.161	0.286	0.264	**0.814**	0.182
CC5	0.212	0.285	0.366	**0.855**	0.351

Discriminant validity on construct level					
	RC	**BC**	**PC**	**CC**	**PERF**
RC	n.a.				
BC	0.514	**0.838**			
PC	0.444	0.368	n.a.		
CC	0.258	0.426	0.403	**0.862**	
PERF	0.209	0.203	0.357	0.331	n.a.

Table 33: Discriminant validity – company age – group 2[993]

[992] Own illustration.
[993] Own illustration.

Group comparison (Size)

	Group1 (Small)		Group2 (Large)		Compa-rability	
	Loading	t-value	Loading	t-value	CoC	
Reflective measurement model						
Behavior control					1.00	
BC1	0.81	7.31	0.80	4.53	-	
BC2	0.87	8.55	0.86	5.51	-	
BC3	0.86	10.61	0.85	6.19	-	
BC4					-	eliminated
Cronb. α	0.80	-	0.79	-	-	
Int. Cons.	0.88	-	0.87	-	-	
AVE	0.71	-	0.70	-	-	
Cultural control					0.99	
CC1	0.87	13.44	0.83	11.23	-	
CC2	0.89	11.83	0.88	13.51	-	
CC3	0.91	21.27	0.89	13.65	-	
CC4	0.85	11.05	0.78	7.52	-	
CC5	0.89	22.89	0.81	11.23	-	
Cronb. α	0.93	-	0.89	-	-	
Int. Cons.	0.95	-	0.92	-	-	
AVE	0.78	-	0.70	-	-	
Discriminant analysis (see appendix)						
Construct	ok		ok		-	
Indicator	ok		ok		-	

	Weight	t-Value	VIF	Weight	t-Value	VIF	Weight Δ
Formative measurement model							
Results control							
RC1	0.68	2.72	1.69	-0.85	2.28	2.50	-1.53***
RC2	0.29	1.03	1.93	-0.07	0.20	2.68	-0.36
RC3	0.28	1.28	1.96	0.79	1.89	3.47	0.51
RC4	-0.36	1.38	2.00	0.45	1.21	2.02	0.81**
RC5	0.33	1.78	1.18	0.47	1.78	2.20	0.14
Cond. Index	13.83	-	-	15.16	-	-	-
Personnel control							
PC1	0.34	1.40	2.00	0.05	0.23	2.04	-0.28
PC2	0.00	0.01	1.69	0.06	0.19	1.76	0.06
PC3	0.02	0.13	1.56	-0.09	0.37	1.67	-0.11
PC4	0.72	2.71	1.48	0.90	3.00	1.58	0.18
PC5	0.24	0.91	1.52	0.15	0.48	2.11	-0.08
Cond. Index	18.21	-	-	21.86	-	-	-

Structural model						
R2	27.7%		23.3%		-	
Q2	10.6%		2.7%		-	
Path coefficients	**Usage**	**Path coeff.**	**Usage**	**Path coeff.**	**Usage Diff.**	**PathC. Diff.**
RC	5.03	0.23	4.71	0.06	-0.32*	-0.18 (n.s.)
BC	5.08	0.13	4.72	-0.04	-0.37***	-0.16†
PC	5.02	0.23	5.01	0.22	0 (n.s.)	-0.01 (n.s.)
CC	5.74	0.11	5.60	0.34	-0.14 (n.s.)	0.23†

n.a. = constructs not comparable (cf. weights diff. and CoC); Significance † = 0.23; * = 0.1; **=0.05; ***=0.01 (one sided)
n.s. = not significant

Table 34: Group comparison company size[994]

[994] Own illustration.

Group comparison (Size)
Group1

Discriminant validity on indicator level					
	RC	**BC**	**PC**	**CC**	**PERF**
BC1	0.391	**0.832**	0.263	0.423	0.248
BC4	0.220	**0.835**	0.358	0.288	0.251
CC1	0.234	0.388	0.448	**0.896**	0.403
CC2	0.218	0.366	0.368	**0.912**	0.350
CC3	0.224	0.443	0.458	**0.915**	0.501
CC4	0.262	0.352	0.353	**0.841**	0.322
CC5	0.365	0.332	0.489	**0.864**	0.515

Discriminant validity on construct level					
	RC	**BC**	**PC**	**CC**	**PERF**
RC	n.a.				
BC	0.366	**0.834**			
PC	0.369	0.372	n.a.		
CC	0.299	0.426	0.488	**0.886**	
PERF	0.398	0.299	0.402	0.488	n.a.

Table 35: Discriminant validity – company size – group 1[995]

Group comparison (Size)
Group2

Discriminant validity on indicator level					
	RC	**BC**	**PC**	**CC**	**PERF**
BC1	0.026	**1.000**	0.298	0.343	-0.093
BC4	0.104	**0.481**	0.278	0.157	-0.003
CC1	0.102	0.300	0.404	**0.737**	0.177
CC2	0.004	0.417	0.340	**0.840**	0.191
CC3	0.225	0.326	0.417	**0.872**	0.286
CC4	0.020	0.251	0.342	**0.842**	0.308
CC5	-0.033	0.185	0.327	**0.835**	0.289

Discriminant validity on construct level					
	RC	**BC**	**PC**	**CC**	**PERF**
RC	n.a.				
BC	0.029	**0.784**			
PC	0.354	0.302	n.a.		
CC	0.077	0.343	0.437	**0.827**	
PERF	0.186	-0.092	0.353	0.315	n.a.

Table 36: Discriminant validity – company size – group 2[996]

[995] Own illustration.
[996] Own illustration.

Group comparison (Company lifecycle)								
	Group1 (Early phases)			Group2 (Late phases)			Compa-rability	
	Loading	t-value		Loading	t-value		CoC	
Reflective measurement model								
Behavior control							0.99	
BC1	0.86	5.64		0.62	3.44		-	
BC2	0.92	6.85		0.73	4.97		-	
BC3	0.83	6.88		0.90	6.08		-	
BC4	0.68	3.83		0.71	3.52		-	
Cronb. α	0.85	-		0.78	-		-	
Int. Cons.	0.90	-		0.83	-		-	
AVE	0.69	-		0.56	-		-	
Cultural control							0.99	
CC1	0.89	14.21		0.82	9.31		-	
CC2	0.95	29.48		0.83	8.24		-	
CC3	0.91	28.74		0.88	11.03		-	
CC4	0.91	20.11		0.74	6.28		-	
CC5	0.85	14.23		0.85	10.51		-	
Cronb. α	0.94	-		0.88	-		-	
Int. Cons.	0.96	-		0.91	-		-	
AVE	0.82	-		0.68	-		-	
Discriminant analysis (see appendix)								
Construct	ok			ok			-	
Indicator	ok			ok			-	
	Weight	**t-Value**	**VIF**	**Weight**	**t-Value**	**VIF**	**Weight Δ**	
Formative measurement model								
Results control								
RC1	0.92	2.96	2.40	-0.71	2.20	2.00	-1.63***	
RC2	0.40	1.44	2.56	-0.20	0.52	2.24	-0.6	
RC3	-0.33	0.88	3.64	0.87	2.44	2.25	1.19**	
RC4	-0.18	0.62	2.31	0.32	1.05	1.88	0.5	
RC5	0.22	0.95	1.55	0.50	1.99	1.45	0.28	
Cond. Index	17.07	-	-	13.42	-	-	-	
Personnel control								
PC1	-0.19	0.98	2.04	0.20	0.81	2.05	0.39	
PC2	0.00	0.00	1.85	0.16	0.52	1.73	0.16	
PC3	0.64	2.90	1.60	-0.34	1.48	1.49	-0.98***	
PC4	0.36	1.82	1.59	0.90	3.16	1.47	0.54	
PC5	0.37	1.78	1.48	0.13	0.41	1.81	-0.24	
Cond. Index	18.25	-	-	19.60	-	-	-	
Structural model								
R2	52.7%			15.3%			-	
Q2	16.6%			3.1%			-	
Path coefficients	**Usage**	**Path coeff.**		**Usage**	**Path coeff.**		**Usage Diff.**	**PathC. Diff.**
RC	5.17	0.12		4.94	0.03		-0.23 (n.s.)	-0.10 (n.s.)
BC	4.96	-0.20		4.89	-0.09		-0.07 (n.s.)	0.11 (n.s.)
PC	4.94	0.47		5.04	0.32		0.1 (n.s.)	-0.15†
CC	5.80	0.40		5.68	0.17		-0.11 (n.s.)	-0.22†

n.a. = constructs not comparable (cf. weights diff. and CoC); Significance † = 0.25; * = 0.1; **=0.05; ***=0.01 (one sided)
n.s. = not significant

Table 37: Group comparison company life cycle stage[997]

[997] Own illustration.

Group comparison (Company lifecycle)
Group1

Discriminant validity on indicator level					
	RC	**BC**	**PC**	**CC**	**PERF**
BC1	0.361	**0.858**	0.331	0.415	0.239
BC2	0.396	**0.921**	0.417	0.467	0.200
BC3	0.435	**0.834**	0.444	0.426	0.266
BC4	0.302	**0.681**	0.230	0.303	0.111
CC1	0.292	0.440	0.473	**0.892**	0.494
CC2	0.277	0.455	0.494	**0.945**	0.529
CC3	0.285	0.481	0.531	**0.912**	0.596
CC4	0.190	0.442	0.414	**0.914**	0.427
CC5	0.272	0.410	0.443	**0.854**	0.543

Discriminant validity on construct level					
	RC	**BC**	**PC**	**CC**	**PERF**
RC	n.a.				
BC	0.459	**0.828**			
PC	0.481	0.446	n.a.		
CC	0.295	0.494	0.526	**0.904**	
PERF	0.373	0.262	0.648	0.580	n.a.
n.a. = does not apply; square root AVE for reflective constructs					

Table 38: Discriminant validity – company life cycle - group 1[998]

Group comparison (Company lifecycle)
Group2

Discriminant validity on indicator level					
	RC	**BC**	**PC**	**CC**	**PERF**
BC1	0.171	**0.621**	0.204	0.367	0.006
BC2	0.228	**0.729**	0.316	0.327	0.035
BC3	0.279	**0.904**	0.288	0.327	0.094
BC4	0.173	**0.711**	0.234	0.181	0.055
CC1	0.129	0.370	0.356	**0.815**	0.209
CC2	0.102	0.373	0.227	**0.829**	0.124
CC3	0.173	0.385	0.373	**0.877**	0.222
CC4	0.030	0.158	0.206	**0.737**	0.146
CC5	0.082	0.204	0.303	**0.847**	0.290

Discriminant validity on construct level					
	RC	**BC**	**PC**	**CC**	**PERF**
RC	n.a.				
BC	0.292	**0.748**			
PC	0.306	0.340	n.a.		
CC	0.129	0.355	0.370	**0.822**	
PERF	0.118	0.086	0.357	0.260	n.a.
n.a. = does not apply; square root AVE for reflective constructs					

Table 39: Discriminant validity – company life cycle – group 2[999]

[998] Own illustration.
[999] Own illustration.

Group comparison (Management experience)								
	Group1 (Low)			Group2 (High)			Compa-rability	
	Loading	t-value		Loading	t-value		CoC	
Reflective measurement model								
Behavior control							0.94	
BC1	0.83	7.71		1.00	4.23		-	
BC2							-	eliminated
BC3							-	eliminated
BC4	0.84	6.75		0.48	1.95		-	
Cronb. α	0.56	-		0.63	-		-	
Int. Cons.	0.82	-		0.74	-		-	
AVE	0.70	-		0.62	-		-	
Cultural control							0.99	
CC1	0.90	21.44		0.74	8.65		-	
CC2	0.91	20.51		0.84	12.45		-	
CC3	0.92	33.12		0.87	16.25		-	
CC4	0.84	14.64		0.84	9.73		-	
CC5	0.86	26.66		0.84	12.78		-	
Cronb. α	0.93	-		0.89	-		-	
Int. Cons.	0.95	-		0.91	-		-	
AVE	0.79	-		0.68	-		-	
Discriminant analysis (see appendix)								
Construct	ok			ok			-	
Indicator	ok			ok			-	
	Weight	**t-Value**	**VIF**	**Weight**	**t-Value**	**VIF**	**Weight Δ**	
Formative measurement model								
Results control								
RC1	0.41	1.90	1.64	0.17	0.53	2.81	-0.24	
RC2	0.09	0.41	1.84	-0.83	1.88	3.29	-0.92*	
RC3	0.74	2.57	2.00	-0.31	0.75	3.36	-1.05**	
RC4	-0.18	0.95	1.71	1.14	2.69	2.51	1.32***	
RC5	0.05	0.26	1.33	0.32	1.06	1.69	0.28	
Cond. Index	13.54	-	-	16.22	-	-	-	
Personnel control								
PC1	-0.07	0.34	1.88	-0.14	0.48	2.20	-0.07	
PC2	0.16	0.78	1.60	0.76	2.43	1.77	0.6†	
PC3	0.10	0.56	1.58	0.04	0.15	1.58	-0.07	
PC4	0.84	4.03	1.44	0.75	2.46	1.65	-0.09	
PC5	0.16	0.67	1.76	-0.35	1.09	1.84	-0.5†	
Cond. Index	18.59	-	-	19.82	-	-	-	
Structural model								
R2	32.3%			22.8%			-	
Q2	12.9%			-1.1%			-	
Path coefficients	**Usage**	**Path coeff.**		**Usage**	**Path coeff.**		**Usage Diff.**	**PathC. Diff.**
RC	4.95	0.24		4.83	0.07		-0.12 (n.s.)	n.a.
BC	4.75	0.01		4.83	-0.28		0.08 (n.s.)	-0.29*
PC	5.08	0.14		4.93	0.29		-0.14 (n.s.)	0.15 (n.s.)
CC	5.65	0.34		5.69	0.28		0.04 (n.s.)	-0.06 (n.s.)

n.a. = constructs not comparable (cf. weights diff. and CoC); Significance † = 0.23; * = 0.1; **=0.05; ***=0.01 (one sided)
n.s. = not significant

Table 40: Group comparison management experience[1000]

[1000] Own illustration.

Group comparison (Management experience)
Group1

Discriminant validity on indicator level					
	RC	**BC**	**PC**	**CC**	**PERF**
BC1	0.391	**0.832**	0.263	0.423	0.248
BC4	0.220	**0.835**	0.358	0.288	0.251
CC1	0.234	0.388	0.448	**0.896**	0.403
CC2	0.218	0.366	0.368	**0.912**	0.350
CC3	0.224	0.443	0.458	**0.915**	0.501
CC4	0.262	0.352	0.353	**0.841**	0.322
CC5	0.365	0.332	0.489	**0.864**	0.515

Discriminant validity on construct level					
	RC	**BC**	**PC**	**CC**	**PERF**
RC	n.a.				
BC	0.366	**0.834**			
PC	0.369	0.372	n.a.		
CC	0.299	0.426	0.488	**0.886**	
PERF	0.398	0.299	0.402	0.488	n.a.

Table 41: Discriminant validity – management experience– group 1[1001]

Group comparison (Management experience)
Group2

Discriminant validity on indicator level					
	RC	**BC**	**PC**	**CC**	**PERF**
BC1	0.026	**1.000**	0.298	0.343	-0.093
BC4	0.104	**0.481**	0.278	0.157	-0.003
CC1	0.102	0.300	0.404	**0.737**	0.177
CC2	0.004	0.417	0.340	**0.840**	0.191
CC3	0.225	0.326	0.417	**0.872**	0.286
CC4	0.020	0.251	0.342	**0.842**	0.308
CC5	-0.033	0.185	0.327	**0.835**	0.289

Discriminant validity on construct level					
	RC	**BC**	**PC**	**CC**	**PERF**
RC	n.a.				
BC	0.029	**0.784**			
PC	0.354	0.302	n.a.		
CC	0.077	0.343	0.437	**0.827**	
PERF	0.186	-0.092	0.353	0.315	n.a.

Table 42: Discriminant validity – management experience– group 2[1002]

[1001] Own illustration.
[1002] Own illustration.

Linearity of constructs (Linear regression)												
	RC			BC			PC			CC		
Model	**R2**	**F**	**p**	**R2**	**F**	**p**	**R2**	**F**	**p**	**R2**	**F**	**p**
Linear	3.2%	9.4	0.00	2.6%	7.7	0.01	6.4%	20.0	0.00	9.6%	30.1	0.00
Logarithmic	2.7%	8.0	0.00	2.3%	6.7	0.01	5.9%	18.4	0.00	9.1%	28.4	0.00
Quadratic	3.3%	4.9	0.01	2.7%	4.0	0.02	6.7%	10.5	0.00	10.3%	16.3	0.00
Cubic	3.8%	3.8	0.01	2.7%	2.7	0.05	7.1%	7.4	0.00	10.4%	16.5	0.00
n	**290**			**290**			**294**			**286**		
n(eliminated)	5			5			1			9		
Comment: Dependent variable - Subjective company performance; n(total)=295												

Table 43: Linearity assumption analysis[1003]

The dissertation builds on a broad literature base summarized in Table 1.[1004]

[1003] Own illustration.

[1004] Cf. Boag (1987), Amat et al. (1994), Romano/Ratnatunga (1994), Perren/Grant (2000), Greenhalgh (2000), Moores/Yuen (2001), Wijewardena/De Zoysa (2001), Wijewardena et al. (2004), Cardinal et al. (2004), Granlund/Taipaleenmaki (2005), Collier (2005), Davila/Foster (2005), Davila/Foster (2007), Davila (2005), Sandino (2007), Berthelot/Morrill (2007).

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