The interrelationship between management control systems and strategy

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1 Abstract

Following Kober, there has been a lot of research concerning the interrelationship between strategy and management control systems (MCS) (Kober, 2007). Still, Henri points out that further research is needed (Henri, 2006).

This paper uses the Merchant and Van der Stede management control framework (Merchant and Van der Stede, 2007) to examine the relationships between a firm's management control system and its strategic capabilities[1]. Using survey data from 184 manufacturing firms in Austria and Germany I want to analyze the association of MCS design and firm capabilities. In addition I want to explore whether or not there are differences between the MCS in Austria and Germany.

2 Keywords

strategy, capabilities, resources, management control systems, personnel control

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[1] I use the terms "competence" and "capability" interchangeably.

2 Problem and research questions

Following Kober, there has been a lot of research concerning the interrelationship between strategy and management control systems (MCS) (Kober, 2007). Still, Kober (2007) points out that the kind of the interrelationship between MCS and strategy is not clear.

Traditional research saw the relationship of MCS and strategy as a simple uni-directional one and the more complex two-way relationship has not been explored (Kober, 2007). The aim of this paper is to examine the interrelationship between a firm's MCS and its strategy. It wants to go beyond traditional research that saw the relationship of MCS and strategy as a simple uni-directional one, where MCS are only influenced by strategy but not the other way round. It is assumed that the strategy of an organisation not only influences the MCS but that a two-way relationship exists where the strategy is also influenced by the MCS (Kober, 2007).

The current business environment is characterized by fast changes in customers, technologies and competition. Thus, organizations need to continuously renew themselves to survive and prosper (Danneels, 2002). Henri explores the role that MCS play in the process of strategic renewal. He concludes that there has been "considerable interest in the relationship between MCS and strategy" and that "a significant body of literature has explored the effects of strategy on MCS and, to a lesser extent, the effects of MCS on strategy".

Still, he believes that further research is needed because "The concept of strategy has been generally examined at a strategic-choice level [...] cost leader versus differentiation [...]". He wants to drive the discussion further by measuring strategy not on the strategic-choice but on the strategic-capabilities level. (Henri, 2006)

In today's rapidly changing environment there is no doubt that having the right strategic capabilities that match the needs of the market is of high importance (Schreyögg and Kliesch-Eberl, 2007). But how can strategic renewal be carried out? How can MCS help solving this problem and how should they be designed?

Henri analyses whether the strategic capabilities of a firm are influenced by its MCS and finds a positive relationship between the interactive use of MCS and strategic capabilities. For further research he suggests to test his model with other capabilities and with other control systems than he used. (Henri, 2006)

This is the aim of this paper. Additionally, I want to analyze if MCS differ between countries. Therefore I define two research questions:

Q1: How is MCS design related to firm capabilities? Are some MCS more suitable in supporting the development of capabilities than others?

Q2: Are there differences in the MCS between Austria and Germany?

3 Literature review

In this section I want to first talk about the state-of-the-art of the literature that deals with the interrelationship between MCS and strategy. Then I want to talk about ways to classify MCS and strategic capabilities.

3.1 Interrelationship between MCS and strategy

There is a broad consensus that management control is an important part of the strategy process (e.g. Simons, 1994). Traditionally, MCS are used as tool to implement the chosen strategy of a company. As Kober (2007) points out "the MCS has been viewed as an outcome of organisational strategy".

Simons (1994) further develops this traditional view and suggests that MCS can not only be used to support the strategy but to systemically lever strategic renewal. Kober (2007) claims that "through interactions with the organisation and with its environment, the information generated by an accounting system could help facilitate strategic change in a proactive way".

Nevertheless, Kober (2007) calls for further research concerning the relationship between MCS and strategy. "While prior studies have highlighted the importance of achieving a fit between an organisation's management control system (MCS) and its strategy [...] the interrelationship between MCS and strategy is not clear. (Kober, 2007)

Traditional research, as already mentioned, saw the relationship between strategic and MCS as a simple uni-directional one, where MCS are shaped by strategy. Kober (2007) claims that the relationship between MCS and strategy could be more complex and believes that there is a two-way relationship where MCS influence and are influenced by strategy.

Henri (2006) supports this view "So far, a significant body of literature has explored the effects of strategy on MCS and, to a lesser extent, the effects of MCS on strategy." Furthermore he adds another aspect and points out that in prior research "the concept of strategy has been generally examined at a strategic-choice level: (i) market positioning: cost leadership versus differentiation [...]." He adds a new aspect to the discussion and argues that "Following the RBV [resource based view], the link between strategy and MCS may occur at the capabilities level"; "the relationship should be examined between capabilities and MCS" (Henri, 2006).

As already mentioned this is the aim of this paper. Thus, I will now talk about ways to classify both, MCS and strategic capabilities.

3.2   The classification of management control systems

In the accounting literature there are many different definitions of control (Redda, 2007). Traditional research sees control as the exercise to monitor division managers (Otley, 1995). However, Otley (1995) argues that this point of view is no longer up-to-date in today's flexible environment. He thinks that it is not enough to monitor employees but that it is necessary to support them in archiving the firm's goals.

According to Merchant and Otley (2007) "a management control system is designed to help an organization adapt to the environment in which it is set and to deliver the key results desired by stakeholder groups, most frequently concentrating upon shareholders in commercial enterprises."

Merchant and Van der Stede believe that control systems have basically two functions: strategic control and management control. Whereas strategic control assesses the question if the strategy chosen by the organization is valid, management control asks the question: "Are our employees likely to behave appropriately?" This question can be divided into several parts (Merchant/Van der Stede, 2007):

- First, do our employees understand what we expect of them?
- Second, will they work consistently hard and try to do what is expected of them?
- Third, are they capable of doing a good job?

The aim of MCS is that the firm can answer these questions with "yes". Merchant and Van der Stede's (2007) developed a well-known framework to classify MCS. They build on Ouchi's (1979, 1980)[2] work and distinguish controls based on the object of control. Therefore they define four types of management control: results controls, action controls, personnel controls and culture controls.

Results controls influence the behaviour of employees by using information from measures for the outcomes of their work. Results controls make sure that the rewards are given to the most talented and hardest working employees, rather than those that

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[2] Ouchi differentiated between output control, behavior control and social control (Ouchi, 1979). Output control on the one hand measures the output of a manager or employee. Behavior control on the other hand is a way to indicate the behavior of a person. Social control is more difficult to describe and has a lot to do with selecting and training highly motivated people that perform their tasks without costly behavior or output control.

have the highest seniority or the best relations within the company. "The combinations of rewards linked to results inform or remind employees as to what result areas are important and motivate them to produce the results the organization rewards. [...] The organization does not dictate to employees what actions they should take; instead employees are empowered to take those actions they believe will best produce the desired results." (Merchant/Van der Stede, 2007).

Nevertheless, results controls cannot always be used. According to Merchant and van der Stede (2007) "They are effective only where the desired result areas can be controlled (to a considerable extent) by the employee(s) whose actions are being influenced and where the controllable result areas can be measured effectively."

Another form of controls are action controls which describe the actions to be taken by the employees. Action controls ensure "that employees perform (do not perform) certain actions known to be beneficial (harmful) to the organization". "They are feasible only when managers know what actions are (un)desirable and have the ability to ensure that the (un)desirable actions (do not) occur." (Merchant/Van der Stede, 2007).

Two forms of action controls mentioned by Merchant and Van der Stede are behavioural constraints and action accountability. "Behavioral constraints are a negative form of action control. [...] The constraints can be applied physically or administratively. [...] One common form of administrative control involves the restriction of decision-making authority." (Merchant/Van der Stede, 2007) That means for example that employees have to involve their boss if important decisions are to be taken.

"Action accountability involves holding employees accountable for the actions they take." (Merchant/Van der Stede, 2007)

Thereby it is important to define what actions should (not) be taken and to communicate them to the employees. The actions for which employees are to be held accountable are often communicated through codes of conduct. (Merchant/Van der Stede, 2007)

According to Merchant and Van der Stede "Personnel controls build on the employees' natural tendencies to control and/or motivate themselves." Two important methods of implementing personnel controls are selection and training of employees. (Merchant/Van der Stede, 2007)

Cultural controls, the last form of controls in the Merchant and Van der Stede framework "are designed to encourage mutual monitoring; a powerful form of group pressure on individuals who deviate from group norms and values." (Merchant/Van der Stede, 2007)

After giving a brief overview of the used management control literature I want give some perspective on strategic capabilities.

3.3   The classification of strategic capabilities

As already mention this paper follows the approach of Henri (2006) and operationalizes strategy as the strategic capabilities possessed by a firm. This goes in line with the resource based view (RBV) of the firm, that sees superior resources and capabilities of firms as the reason for competitive advantage. The RBV is one of the most widely accepted theoretical perspectives in the strategic management field (Newbert, 2007).

Barney (1991) defines resources as "all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness". If individual resources work together they can create organizational capabilities; capabilities are what the firm can do and are the sources of competitive advantage and superior performance (Grant, 2007).

Or as Schreyögg and Kliesch-Eberl (2007) put it "There seems to be a consensus that a capability does not represent a single resource in the concert of other resources such as financial assets, technology, or manpower, but rather a distinctive and superior way of allocating resources. It addresses complex processes across the organization such as product development, customer relationship, or supply chain management".

Still, the question remains which capabilities are important and should be measured. This paper follows the approach of the balanced scorecard (BSC) (Kaplan/Norton, 1996). The traditional BSC has four perspectives (financial perspective, customer perspective, internal business perspective and learning & development perspective). In this paper I measure seven capabilities based on the four BSC perspectives:

BSC perspective	Measured capability	Explanation
Financial perspective	Finance competence	Firm has strong accounting, financial management and planning, and forecasting skills (compared to competition)
Customer perspective	Three market-related capabilities: • customer orientation, • competitor orientation and • external orientation	Firm knows a lot about their customers, Firm knows a lot about their competitor, Firm is very externally focused (employees go to conferences, contact to universities etc.)
Internal business perspective	Two process-related capabilities: • competence exploration, • competence exploitation	The processes in the firm are very efficient. The company is highly innovative and the products and processes are continuously changed.

Table 1: Measured capabilities

I do not measure a capability for the learning & development perspective as I believe this to be part of the MCS of a firm (personnel controls).

3.4   Summary table of the important literature

Article	Author	Journal	Year
Interrelationship between MCS and Strategy			
Management control systems and strategy: a critical review	Langfield-Smith, K.	Accounting, Organizations and Society	1997
Using management control systems to achieve alignment between strategic investment decisions and strategy	Slagmulder, R.	Management Accounting Research	1997
An empirical investigation of the relation between the use of strategic human capital and the design of the management control system	Widener, S.	Accounting, Organizations and Society	2004
The effects of the interactive use of management control systems on product innovation	Bisbe, J. and Otley, D.	Accounting, Organizations and Society	2004
Management control systems and strategy: A resource-based perspective	Henri, J.	Accounting, Organizations and Society	2006
The interrelationship between management control mechanisms and strategy	Kober, R. Et al.	Management Accounting Research	2007
Organizational antecedents of second-order competences	Danneels, E.	Strategic Management Journal	2008
Management Control Systems			
A conceptual framework for the design of organizational control mechanisms	Ouchi, W.	Management Science	1979
Control: Organizational and economic approaches	Eisenhardt, K.	Management Science	1985
Control theory in strategic human resource management: the mediating effect of administrative information	Snell, S.	Academy of Management Journal	1992
Research in Management Control: An Overview of its Development	Otley, D. et al.	British Journal of Management	1995
Management control systems in research and development organizations: the role of accounting, behaviour and personnel controls	Abernethy, M. and Brownell, P.	Accounting, Organizations and Society	1997
Management control systems design within its organizational context: findings from con-	Chenhall, R.	Accounting, Organizations and	2003

tingency-based research and directions for the future		Society	
An empirical analysis of the levers of control framework	Widener, S.	Accounting, Organizations and Society	2007
Emerging themes in management control: A review of recent literature	Berry, A.J. et al.	The British Accounting Review	2009
Strategic Capabilities			
Firm Resources and Sustained Competitive Advantage	Barney, J.	Journal of Management	1991
Dynamic capabilities and strategic management	Teece, D. et al	Strategic Management Journal	1997
Dynamic Capabilities: What are They?	Eisenhardt, K. and Martin, J.	Strategic Management Journal	2000
Guest editors' introduction to the special issue: why is there a resource-based view? Towards a theory of competitive heterogeneity	Hoopes, D. et al.	Strategic Management Journal	2003
The dynamic resource-based view: capability lifecycles	Helfat, C. and Peteraf, M.	Strategic Management Journal	2003
Resolving the Capability-Rigidity Paradox in New Product Innovation	Atuahene-Gima, K.	Journal of Marketing	2005
Measuring the Relationship Between Managerial Competencies and Performance	Levenson, A. et al.	Journal of Management	2006
A Review of Approaches to Empirical Research on the Resource-Based View of the Firm	Armstrong, C. And Shimizu, K.	Journal of Management	2007
Empirical research on the resource-based view of the firm: an assessment and suggestions for future research	Newbert, S.	Strategic Management Journal	2007
How dynamic can organizational capabilities be? Towards a dual-process model of capability dynamization	Schreyögg, G. and Kliesch-Eberl, M.	Strategic Management Journal	2007
Managing firm resources in dynamic environments to create value: looking inside the black box	Sirmon, D. et al.	Academy of Management Review	2007
Strategic resources and performance: a meta-analysis	Crook, T. et al.	Strategic Management Journal	2008

4 Method

4.1 Data collection

Data was collected with the help of a structured online questionnaire.[3] The questionnaire was developed with the help of the online-tool 2ask.[4] The advantages of online surveys are that they are less costly and complex than sending out written questionnaires by mail. Additionally, no data-entry mistakes can occur. Also the problem of missing values can be eliminated. The questionnaire can only be submitted as soon as all questions are answered. Nevertheless, the main disadvantage of questionnaires is that one cannot be sure that it was really filled out by the target person (e.g. the CEO gives the questionnaire to his/her secretary) (Diekmann, 2004).

I use data from manufacturing firms in Austria and Germany. The target population consisted of 2465 medium-sized firms (50-250 employees) listed in the Markus database (Bureau van Dijk Electronic Publishing). A random sample of 1400 firms was drawn from the total population. However, the lack of a contact email address reduced the number of usable firms in the target population to 1357. The data was collected through a questionnaire sent to the CEOs of these 1357 firms by email.

A common problem with online surveys is the usually low response rate (Diekmann, 2004). To improve the response rate of my survey I sent out three reminder emails which led to a total of 184 completed questionnaires (response rate: 13.5%).[5]

4.2 Variable measures

The questionnaire consisted of approx. 90 closed questions. I measure seven competences. To improve reliability and validity I build on well-established measurement concepts to operationalize the constructs: customer orientation (see Narver and Slater, 1990), competitor orientation (see Narver and Slater, 1990), external orientation (Dannels, 2008), exploration competence (see Zahra, Ireland and Hitt, 2000), exploitation

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[3] Diekmann (2004) mentions the following advantages of questionnaires versus interviews: respondents have more time to think about the questions, they cannot be influenced by the interviewer and the costs are low.

[4] www.2ask.at

[5] The initial email was sent out in the beginning of December 2008. The study lasted until the beginning of March 2009.

competence (see Zahra, Ireland and Hitt, 2000) and finance competence (see De-Sarbo, 2005).

Additionally, I measure personnel controls (see Snell, 1992), action controls (see Widener, 2007 and Hage and Aiken, 1980) and results control (see Snell, 1992) and cultural controls (see Widener, 2007).

Each construct was operationalized through two to five items. All constructs were measured with a seven point Likert scale. The respondents had to tick their degree of agreement with the statement (applies fully – does not apply at all).

Variable	Number of Items	Cronbachs α	Source
Recruiting process	3	0,72	adapted from Snell (1992)
HR development	3	0,75	adapted from Snell (1992)
Culture controls	4	0,9	adapted from Widener (2007)
Results controls	5	0,79	adapted from Snell (1992) and Henri (2006)
Action accountability	2	0,83	adapted from Widener (2007)
Behavioural constraints	3	0,7	adapted from Aiken and Hage (1980)
Customer orientation	4	0,84	adapted from Narver and Slater, 1990
Competitor orientation	3	0,9	adapted from Narver and Slater, 1990
External orientation	3	0,67	adapted from Danneels, 2008
Competence exploration	4	0,76	adapted from Zahra, Ireland and Hitt, 2000
Competence exploitation	4	0,61	adapted from Zahra, Ireland and Hitt, 2000
Finance competence	3	0,93	new scale
Organizational slack	3	0,81	adapted from De Luca and Atua-hene-Gima (2007)
Environmental uncertainty	4	0,83	adapted from Moers, 2006

Table 2: The constructs

4.3 Avoidance of bias

When doing empirical research in social sciences one has to be aware of the problem that hypotheses concerning relationships between two things can neither be definitely verified nor falsified. Even with the best methods it is impossible to avoid all mistakes and bias that can occur. All that can be done is find evidence that supports or does not support hypotheses (Diekmann, 2004).

Nevertheless, I tried to improve the quality of my research through a number of tests:

Target	Procedure/test	Action step
Improve reliability	• Cronbach's α • Factor analysis	• I calculated the Cronbachs α to improve the reliability of the constructs. • Furthermore, I conducted an exploratory factor analysis.

Improve content validity	• Use of existing and validated scales (if appropriate)
	
	• Pre-test of the questionnaire in two steps:
	
	  o four researchers from the Department of Strategic Management at the WU Vienna were asked to revise the questionnaire
	
	  o five CEOs of Austrian medium-sized firms were interviewed and asked to complete
		The valuable feedback and recommendations gained from the pretest were included in the final version of the questionnaire before sending it out to the firms.[6]

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[6] Pretests are especially important for questionnaires as the questions must be easy and self-explaining because the respondents have no interviewer that can help them with comprehension problems (Diekmann, 2004).

	the questionnaire.	
Avoid spurious correlation[7]	Control for spurious correlation	To improve the validity of my model I also included control variables to avoid the problem of spurious correlation. I control for environmental uncertainty, size and age of the firm. In addition I will analyze if differences between family and non-family firms occur.
Avoid early – late respondents bias	Control for early – late respondents bias	To avoid bias I will control for early and late respondents bias and compare the answers of firms that filled out the questionnaire in the first wave with firms that filled out the questionnaire in the second wave.[8]

Table 3: Validation of constructs

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[7] A common problem when testing hypotheses is the spurious correlation. That means that two variables are correlated but there is no causal relationship. The reason for this is that both variables are correlated with a third variable.

[8] The first wave was from December 2008 – March 2009. The second wave started in May 2009 and is expected to last until the end of June 2009.

5 Results

As already mentioned I try to answer two research questions:

Q1: How is MCS design related to firm capabilities? Are some MCS more suitable in supporting the development of capabilities than others?

Q2: Are there differences in the MCS between Austria and Germany?

To test my data I conducted several regression analyses, where I measured the influence of different types of management control on different capabilities.

Additionally, I conducted an ANOVA (analysis of variance) to assess whether or not I find differences in the MCS between Austria and Germany.[9]

5.1 Descriptive statistics

Variable (n=184)	Minimum	Mean	Maximum	S.D.
Recruiting process	1	3,84	7	1,31
HR development	1	5,16	7	1,13
Culture controls	1	5,16	7	1,25
Results controls	1	4,76	7	1,11
Action accountability	1	4,04	7	1,8
Behavioural constraints	1	2,82	6,67	1,21
Customer orientation	2,25	5,48	7	1,11
Competitor orientation	1	4,7	7	1,36
External orientation	1,67	4,8	7	1,29
Competence exploration	1	4,32	7	1,28
Competence exploitation	2	5,23	7	1,08
Finance competence	1	5,0	7	1,38

Table 4: Descriptive statistics

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[9] Currently my results on the differences between Austria and Germany are only preliminary as my sample of Austrian firms is not large enough to be statistically significant. I will further improve the response rate of my study until the end of June to confirm my findings.

5.2 Regressions

In total I conducted six regressions, where I measured the influence of the different types of MCS on the different competences.

Dependent variables	Predictor variables	Control variables
Customer orientation	Recruiting process	Environmental uncertainty
Competitor orientation	HR development	Family-owned firm
External orientation	Culture controls	Family-run firm
Competence exploration	Results controls	Age of the firm
Competence exploitation	Action accountability	Number of employees
Finance competence	Behavioural constraints	

Table 5: Variables included in the Regression

Dependent variable	Significant predictor variables	P =
Customer orientation	HR development	,000
Competitor orientation	HR development	,000
	Family-owned firm[10]	,001
External orientation	HR development	,000
	Recruiting process	,000
Competence exploration	Recruiting process	,000
	Environmental uncertainty	,000
Competence exploitation	HR development	,000
	Number of employees	,002
Finance competence	Results controls	,000
	Action accountability	,001
	Number of employees	,005

Table 6: Significant predictor variables

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[10] The Competitor orientation was lower in family-owned firms.

5.3   Differences in MCS between Austria and Germany

When I analyzed the differences in the MCS between Austria and Germany I found significant differences between the Recruiting process in Austria compared to the Recruiting process in Germany.

As already mentioned the results are at the moment only preliminary as the number of Austrian firms in my sample is too small to be statistically significant.

However, I did not find significant differences between other types of MCS between Austria and Germany. The reason for this might also be the too small number of Austrian firms in the sample.

Recruiting process	Austria (n=24)	Germany (n=160)
Mean	4,47	3,74
p=		0,01

Table 7: Differences in the Recruiting process in Austria and Germany.

6 Conclusion

Concerning the question if MCS design is related to firm capabilities it can be said that this view is supported by the data. I find statistically significant relations between MCS and all tested strategic capabilities. Furthermore, I find support for the assumption that some MCS are more suitable in supporting the development of capabilities than others. However, the answer to the question which MCS are better is capability-specific.

As already mentioned I tested three types of capabilities:

1. Market-related capabilities (customer orientation, competitor orientation, external orientation

2. Process-related capabilities (competence exploration, competence exploitation)

3. Finance capability

For the market-related capabilities and for competence exploitation (processes are very efficient) the most important MCS is the HR development. The firms in my sample that do a lot of HR development have also significantly higher customer, competitor and external orientation as well as more efficient processes.

The highly innovative (competence exploitation) firms in my sample have a significantly better recruiting process. For these firms the HR development seems to be less important than having the right people. The reason for this could be that here the environmental uncertainty is very high and therefore it is very difficult to give the employees the right training.

Firms with good finance capabilities have also strong results controls. That makes very much sense as companies that rely heavily on data have usually also better accounting and finance capabilities.

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