Boundary Management in Projects: Antecedents, Activities and Performance

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December 2010

Editor: Finn Olesen

Department of Environmental and Business Economics
IME WORKING PAPER 106/10

ISSN 1399-3224

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Abstract

Despite increasing interest among practitioners and the recent scientific explorations on the dynamics of boundary management in project and team contexts, the existing studies seems to lack empirical understanding on the factors that explain the boundary management behavior of project managers. The purpose of this study is to analyze how the three antecedent factors - cross-functional participation, embeddedness and top management control - are related to four different types of boundary management activities practiced by project managers, namely coordinating, enabling, reporting and guarding. Based on the sample of 236 projects, the results show that embeddedness and top-management control have positive influence on boundary-management activities and cross-functional participation has both positive and negative contribution to boundary management activities. Furthermore, the results reveal that boundary management activities have both positive and negative influence on project performance. Contributions of the research are discussed, as well as practical implications, limitations, and directions for future research.

Keywords: Boundary management, project team, embeddedness, cross-functional participation, top-management control

Introduction

The development of new products and organizational practices has become increasingly complicated to manage due to the expanding architectural complexity of the developed systems or products and shortened time-to-market objectives (Kazanjian & Drazin, 2000). To overcome the challenges of product complexity, companies often engage a large number of specialists from different parts of the organization and outside the organization (e.g. from suppliers, customers and partner organizations), and designate a person to be responsible for the coordination between teams (Langerak & Hultink, 2005). In addition, each team often has a leader that is responsible for leading and managing the work of specialist within that team. These types of organizational structures are called multi-team projects or multi-team systems and have recently evoked increasing interest among researchers (Hoegl, Weinkauf, & Gemuenden, 2004; Kratzer, Gemunden, & Lettl, 2008; O´Sullivan, 2003). This paper aims to contribute to the topic of boundary management activities,[1] which are necessary to bridge the organizational boundaries that exist between multi-team project and different stakeholders, e.g. functions of the parent organization, customers, stakeholders and other projects (Katz & Kahn, 1978). Previous research has shown that boundary management activities[2] are necessary to ensure the exchange of information and knowledge (Druskat & Wheeler, 2003), to protect the project (Ancona & Caldwell, 1992), to create legitimacy and support (Lehtonen & Martinsuo, 2008) and to coordinate and negotiate between different stakeholders (Bezrukova, Ramarajan, Jehn, & Euwema, 2003).

Furthermore, literature has shown that there are strong links between the different boundary management activities employed by team leaders (Druskat & Wheeler, 2003) and team members (Marrone, Tesluk, & Carson, 2007) and project team performance (Ancona & Caldwell, 1992; Hirst & Mann, 2004; Katz &

1 Some authors use the term "boundary spanning" to refer to what we call boundary management activities in this article.

2 For definition see: Boundary management activities –chapter.

Tushman, 1979). However, limited research has been done on the various antecedents that could explain the adoption of boundary management activities that project managers engage in (Choi, 2002; Edmondson, 1999; Joshi, Pandey, & Han, 2009; Marrone et al., 2007).

Prior research has addressed the boundary management activities undertaken by project teams and individuals, such as gate-keepers, liaisons and individuals in brokerage roles (Katz & Tushman, 1983; Gould & Fernandez, 1989; Allen & Cohen, 1969). However, as the existing understanding on project manager´s boundary management activities in multi-team project is rather scarce, we aim to provide further understanding on that by proposing and testing a model that relates boundary management activities in multi-team project, undertaken by project manager, to three explaining factors (embeddedness, cross-functional participation and top-management control) and project performance. The study makes three contributions to existing literature. First, this study aims to increase our understanding of three different antecedents to boundary-management activities. Prior contributions on boundary management were either limited to investigation of the relations between boundary management activities and project performance, or if considering antecedents, theoretical and conceptual in nature (Choi, 2002; Joshi et al., 2009; Marrone, 2010). Second, this study assimilates and refines existing research on boundary management by confirming and disconfirming the key boundary management activities identified by Ancona et al. (1992), with subsequent empirical findings in a different context (as proposed by Marrone (2010). Most of the existing empirical studies of boundary management in a team and project context are based on relatively small sample sizes (Hirst & Mann, 2004; Hoegl et al., 2004; Marrone et al., 2007), so this study makes an empirical contribution by testing some of the results identified by the previous studies in a larger population of projects. Moreover, through empirical analysis, this study examines the validity of the prior findings from single-team projects in a more complex multi-team project context. Third, in contrast to research on team boundary management (Marrone et al., 2007), which focuses on single team context, this study only focuses on boundary-

management activities in multi-team projects employed by project managers, which provides results to advance the team boundary spanning literature. In the following, we provide a brief literature review on the antecedents of boundary management and boundary management activities in order to develop hypotheses based on prior research. Next, we describe the methods. Then we report the results of the analysis. Finally, we discuss the results, their practical implications, the limitations of the study, and ideas for future research.

Literature Review and Hypotheses Development

Scholars in boundary-management research have argued that we have limited understanding on what are actually the antecedent factors that explain different types of boundary management behavior in organizations and teams (Choi, 2002; Joshi et al., 2009; Marrone et al., 2007; Marrone, 2010). Recently, a few studies attempted to understand the dynamics behind boundary management. Marrone et al. (2007), for example, found that the level of external focus of teams is positively related to individual boundary spanning behavior. This is to say that the more team is dependent on the team´s external inputs, such as resources and information, the more boundary spanning is expected. In addition, Choi (2002) proposed that team external activities (boundary management activities) could be explained through team characteristics such as team composition, group development, and leadership. Finally, Joshi et al. (2009) presented a theoretical framework to study task-based antecedents, team-level antecedents and contextual antecedents of team boundary spanning (Joshi et al., 2009).

Boundary-management activities have also been shown to predict the project performance, so that the influence of boundary management activities on project performance is dependent on the type of the boundary management activity applied (Ancona & Caldwell, 1992). For example, Ancona et al. (1992) found four different boundary management activities: ambassadorial, task-coordinator, scouting and isolationist activities) and showed that both ambassadorial activities (protecting, securing and promoting the team) and task-

coordinator activities (coordination, negotiation and feedback) are positively associated with team performance (Ancona and Candwell, 1992). Furthermore, Ancona et al. (1992) found that scouting activities (intelligence gathering) was found to have negative effect on the performance. The explanation could be that teams with a high degree of scouting activities might lose the ability to focus on internal processes and capabilities when they are spending too much time on searching for answers in the environment. On the other hand, isolationist activities have positive contribution to fluency of team´s internal processes and team cohesion. But since isolationist teams neglect external activities, they perform poorly on external measures of performance (Ancona and Caldwell, 1992).

In the next sections, we aim at developing a comprehensive model based on theoretical perspectives that identifies specific antecedents of boundary-management activities, types of boundary-management activities and their relation to project performance. We illustrate the relations and theoretical hypotheses at the end of this section in Figure 1.

Embeddedness

In most of the empirical studies, a project's interdependence (embeddedness) with other organizational units and the external environment was not seen as an antecedent factor for boundary management activities, but rather regarded as a moderating factor between boundary management activities and team performance (Choi, 2002). However, aligned with the ideas of resource dependence theory, it has also been argued that some project groups actively manage their external relations because they may depend upon outsiders for information or resources (Choi, 2002; Joshi et al., 2009; Pfeffer & Salancik, 1977). Joshi et al. (2009) argued that mutual dependence on technology, skilled personal, knowledge, and financial resources may foster boundary management activities in an effort to gain greater access and control over scarce organizational resources.

Likewise, the concept of embeddedness (Granovetter, 1985) can be used to explain the actions of actors within an organization (Boekema & Rutten, 2004). According to Granovetter (1985), an organization (and projects) tends to be embedded in multiple, complex social relationship with other organizations (and projects) throughout its environment (the overall structure of the network). Granovetter (1985) emphasized the interdependence between organizations situated in the same social context (i.e., between projects and organization in this study) and argued that all individual and organizational behavior is "constrained by on-going social relation". Combining the ideas from resource dependency perspective and the concept of embeddedness, we propose that the embeddedness of the project, that is the extent to which teams have to exchange resources or rely on other stakeholders in order to accomplish team goals, will explain the boundary management activities. Furthermore, Boekama et al. (2004) found that structural embeddedness explained both the actions of the actors in the network and the performance. These findings and arguments are supported by the study of Kogut et al. (1992), who found empirical evidence that firms (project) that are more embedded in the network may perform better than those that are not (Kogut & Zander, 1992). Based on the discussion above, we propose the following:

Hypothesis 1: The More Embedded the Project, the More Project Managers are Engaged in Boundary-Management Activities.

Cross-Function Participation

Studies on product development have argued that participating people from different functions within the organization and outside the boundaries of organization contribute to the success of innovation and development of projects (Argote & Ingram, 2000; Brown & Eisenhardt, 1995; Tjosvold & Wong, 2004). In addition, it was found that heterogeneity in team participants' expertise (Edmondson, 1999; Keller, 2001) and functional specialty areas (Ancona & Caldwell, 1992) increased external communication because heterogeneous

teams are more likely to have contacts of greater number and diversity outside the group boundary (Choi, 2002). These findings were supported by studies of Edmonson (1999) and Keller (2001), who found that cross-functional teams conducted more external activities than teams with less diversity. Additionally, Keller (2001) conceptualized boundary management activities as project´s external communication and viewed functional diversity as an antecedent. His findings showed that utilization of cross-functional groups was positively related to project performance through the mediation of external communication. In other words, diversity in project groups enables a better utilization of knowledge from different external sources (Keller, 2001) because diversity in the competences of the team members helps the team to obtain and absorb external knowledge. Based on the findings from these prior studies, we propose:

Hypothesis 2: The Higher the Cross-Functional Participation, the More Project Managers are Engaged in Boundary-Management Activities.

Top-Management Control

Research has shown that effective management plays a critical role in ensuring project success[3] (Pinto & Slevin, 1998). While high amount of the management research in projects has focused on project manager´s perspective, it is also acknowledged the importance of the roles higher in an organizational hierarchy, such as project sponsor or project owner for project success (Turner & Mûlller, 2004; Müller, 2003). Several researchers have emphasized the importance of high level sponsor to guarantee the necessary resources for a project (Cooke-

3 There is lack of general agreement within project management literature on what is project success. Several models that have been proposed and they are often inconsistent as individual criteria are included under different headings. The researchers within project management area, however, seem to agree that project success is a multidimensional concept and may differ according to the assessors who are evaluating it. It is proposed that the success of the project could be assessed at least from four different perspectives including: project efficiency, impact in the customer, direct business and organizational success and preparing for the future (Shenhar & Dvir, 2007).

Davies, 2002; Crawford, Cooke-Davies, Hobbs, Labuschagne, Remington, & Ping, 2008) (and it is also well-known that top-management support is crucial in order to guarantee the progress and outcomes of the projects (Lechler & Thomas, 2007; Zimmerer & Yasin, 1998). Even if the top-management support has been acknowledged in project management, less attention has been given to controlling activities undertaken by top-management. From the controlling perspective the role of top-management is to ensure that projects are carried out in accordance with organizational objectives (Ouchi, 1979). Top-management control mechanisms can be both informal (Kirsch, Ko, & Haney, 2010; Ramaswami, 1996; Simons, 1991) and formal (Bonner, Ruekert, & Walker, 2002; Eisenhardt, 1985; Ouchi, 1979; Poskela & Martinsuo, 2009). In this study, however, we focus only on two formal control mechanisms: process control and output control because these two control mechanisms are often seen as the core of any management control model. In addition, it is difficult to imagine an effectively working organization without either of these control mechanisms. Process control are mechanisms used to influence the means to achieve desired ends by specifying and monitoring the behavior and activities to be followed by the team, an example of which is the stage-gate model (Cooper, Edgett, & Kleinschmidt, 2002). Output controls are mechanisms used to set performance standards (e.g., deadlines, budgets, target performance objective) and evaluate results (Poskela & Martinsuo, 2009).

Research on control mechanism is dictated by the continuing discussion on the effect of control on performance (Bonner et al., 2002; Cooper et al., 2002; Ramaswami, 1996). In recent NPD research, the stage-gate model (a process control mechanism) was found to support a positive relation to project performance (Cooper et al., 2002). On the other hand, Ouchi (1979) found a negative relationship between the use of process control mechanisms and project performance. It is argued that, especially under conditions of high uncertainty, process control mechanisms might even be counterproductive. Bonner et al. (2002) proposed that when formal process controls become too detailed and at-

tempt to dictate how specific activities should be carried out, the autonomy of the project team will suffer and the performance of the project decreases.

Although control in a project context has been studied extensively, remarkably less attention is given to the relation between top-management control and boundary management behavior. When a project is subjected to the control of top-management, for example, due to strategic importance of a project, special expectations are directed towards project managers to ensure that the project reaches the planned goals and satisfies different stakeholders. As projects most often need to compete with other projects and organizational functions on priority, human resources and attention (Clark & Wheelwright, 1992), executing the project according to expectations requires constant negotiations and networking activities with different stakeholders (Hoegl, Parboteeah, & Munson, 2003). Thus, it is expected that the more top-management is paying attention to project by controlling, the more important the project is perceived for the organization, and the higher expectations are set for project manager on project´s success. The expectations are often interlinked with incentive schemes, which accent the importance of project success to project manager´s career. In order to decrease the uncertainty related to expectations and ensure project success, project manager attempts to influence on project´s external elements and processes which are closely inter-related to project, by collecting information to support decision making, negotiating and engaging different stakeholders to the project. Based on the prior studies discussion above, we propose the following:

Hypothesis 3: The More Top-Management Control, the More Project Managers are Engaged in Boundary-Management Activities.

Boundary Management Activities

Boundary management activities are defined as activities to establish relationships and interactions with external stakeholders that can assist the team in meeting objectives (Ancona & Caldwell, 1992; Marrone et al., 2007). Research

has shown that boundary management activities have at least two functions: information processing and external representation. Information processing functions (Aldrich & Herker, 1977), also referred as information gathering (Hansen, 1999), includes scanning the external environment, interpreting and filtering information that is relevant and transferring the information to the project. External representation functions, however, consist of activities undertaken to gain legitimacy for the project through making stakeholders aware of the project (Katz & Tushman, 1983).

Boundary management activities are closely related to the performance of the team or project. For example, Ancona and Candwell (1992) studied new product development teams and found that high performing teams generally engaged in more externally oriented activities than low performing teams. They also found that project managers and members in new product teams engage in four different types of external-oriented activities (ambassadorial, task-coordinator, scouting and isolationist activities) and demonstrated the different relationships between those activities and team performance. Ambassadorial activities involve persuading outsiders to support and protect the team and securing resources. Task-coordinator activities include interactions with outsiders in negotiating technical issues and getting feedback. Ambassadorial activities and task coordinator activities have a positive influence on performance (Ancona & Caldwell, 1992). Scouting activities aim at scanning new ideas on competition, market or technology, and were found to have a negative effect on the internal performance measurements, such as the team's processes and cohesion. Finally, isolationist activities focus on a team's internal activities. Ancona and Caldwell (1992) found that isolationist activities have positive contributions to the fluency of a team's internal processes and team cohesion, but have negative effects on external measures of performance, such as adherence to a schedule or budget (Ancona & Caldwell, 1992).

Druskat and Wheeler (2003) studied the role of external leaders in self-managed work teams and focused on the role of boundary-spanning activities and their

relevance to team effectiveness.[4] They found that superior performers utilized a boundary-spanning position in teams. Their results revealed that effective external leaders bridge the boundaries between the team and the larger organizational environment by moving across the team boundaries in order to create relationships, scout relevant new ideas and information, create external support for the team by persuading all relevant stakeholders, and providing motivation and empowerment for the team to reach successful outcomes (Druskat & Wheeler, 2003).

Guinan et al. (1998) examined two external activities that were closely related to boundary management: visionary activities and guarding activities. Visionary activities aim at interpreting and influencing the team's environment, and are close to the ambassadorial and scouting activities revealed by Ancona et al. (1992). Guarding activities are activities to monitor and restrict the external influence of the team. These activities are similar to what is often referred to as gatekeeper activities (Katz & Tushman, 1983). Both guarding and gatekeeper activities consist of constant evaluation and identification of information that is critical for project execution and goal achievement. Guinan et al. (1998) found that visionary activities are positively related to performance, whereas guarding activities have a negative impact on performance.

The studies referred to in the above section suggest that the effects of boundary-management activities on project performance are dependent on the type of boundary-management activities performed. Activities that aim to isolate and guard the project from the external environment are argued to have negative influences on external measurements of project performance, and activities that

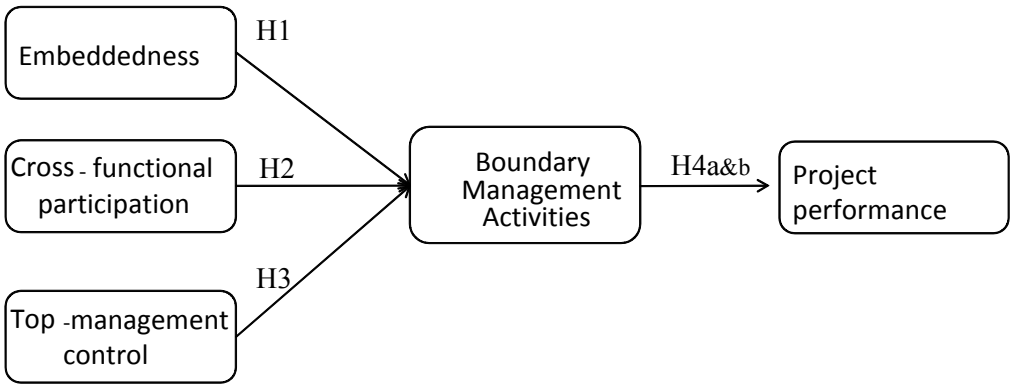
4 The concepts team performance and team effectiveness are in the literature used interchangeably. The exact measurement on the team effectiveness is often dependent on the specific organizational content and type of the team. In their frequently referred article Cohen and Bailey (Cohen & Bailey, 1997) introduces three dimensions for team effectiveness: (1) performance effectiveness assessed in terms of quantity and quality of outputs, (2) member attitudes, and (3) behavioral outcomes. The additional definitions and dimensions for team effectiveness can be found from Guzzo & Dickson (1996), Sundstrom et al. (1990), and Hackman (1987).

are related to influencing the environment or interacting with the stakeholders are argued to have positive effects on project performance. Based on the discussion above, we purpose the following:

Hypothesis 4a: The More Project Managers are Engaged in Boundary Management Activities that aim to isolate a Project from the Environment, the Lower the Project Performance.

Hypothesis 4b: The more Project managers are Engaged in Boundary-Management Activities that aim at Creating Interactions between a Project and the Environment, the Higher the Project Performance.

Figure 1. Hypothesized Model[a]



a. Boundary-Management Activities not identified.

In the next section, we will report on the methods and data used in the empirical part of our study.

Methods

Data Collection and Sample

The empirical study consisted of a questionnaire survey targeted to different industry and service companies in Finland. The objective of the questionnaire was to collect data on management practices such as project controlling, boundary management, and coordination in multi-team projects.[5] Moreover, the questionnaire included several questions concerning project characteristics, such as type, size and budget, and project performance. The questionnaire was tested with several industry representatives that had been involved with multi-team projects and fellow researchers in order to ensure the clarity of the questionnaire and the understandability of the questions. Minor changes on questionnaire items were made based on the comments from the industry representatives. The questionnaire was administered in the language of the country where the research was executed.

The population included all organizations in Finland that employed more than 250 employees. The questionnaire was sent by mail to 2043 persons in 911 organizations in 2007. The survey was sent to persons in charge of development activities, with titles such as program manager, development manager, development director, product development manager, product development director or R&D manager. The final sample consisted of 236 responses from persons in 208 organizations at a response rate representing 11.5% of the whole target population of 2043 individuals and a response rate of 22.8% regarding the 911 target organizations. These response rates can be considered rather low. Thereby, due to the possible bias that may result from the relatively low response rate, non-response bias testing was executed. Possible response bias was

5 In this study we use the term multi-team project to refer to a project which has individuals allocated into several concurrently operating teams, each team having their own area of responsibility, nominated leader for each team, and a dedicated project manager to take care of coordination among the teams.

tested by comparing respondent age, position in the organization, project size and project budget of early respondents with those of late respondents. The results showed that were no statistically significant differences between early and late respondents, and thus, response-bias did not represent a serious problem in this study.

In terms of project type, 48% of responses represented general organizational development projects, 23% product development projects, 17% IT system development projects and 8% investment projects. The sample projects differed in number of concurrent sub-projects and number of employees. The majority of the projects had three to six sub-projects, but projects with 6-10 sub-projects and larger were also represented. In addition, 41% of the programs in our sample employed 21-50 people, 20% employed 51-100 people, and 17% employed from 101 to 200 people. A summary of the sample projects is presented in Table 1.

Table 1. Sample Projects

Project type	**No**	**%**	**Number of sub-projects**	**No**	**%**
Product development	54	22.9	2-5	159	67.4
IT system development	41	17.4	6-10	56	23.7
Investment project	18	7.6	11-20	12	5.1
Organizational development	114	48.3	> 21	5	2.1
N/A	9	3.8	N/A	4	1.7
Project size (Euros)	**No**	**%**	**Employees**	**No**	**%**
< 100,000	27	11.4	≤ 21	31	13.1
100,000 – 500,000	72	30.5	21-50	97	41.1
500,001 – 1,000,000	45	19.1	51-100	48	20.3
1,000,001 – 5,000,000	61	25.9	101-200	40	17.0
> 5,000,001	26	11.0	> 201	18	7.6
N/A	5	2.1	N/A	2	0.9

Of the 236 respondents, approximately half (55%) came from private sector organizations and half (45%) from public sector organizations. In addition, the respondents primarily represented either upper management (38%) or middle management (39%), but experts (19%) were also represented. Moreover, from all of the respondents, 97.2% had more than 4 years experience in project management.

Measures

Boundary-Management Activities. Drawing on the prior studies of Ancona and Caldwell (1992) and Druskat and Wheeler (2003), we developed 12 indicator items that reflected different managerial activities in the project-organization

interface. The items had a stem “to what extent the key responsible person in the project (e.g., project manager) was engaged in...” and included, for example, “seeking information from the organization to support the planning and execution of the project” or “identifying risks or threats from the organization that would challenge the project”, as sample questions.

Embeddedness. Embeddedness refers to the degree to which a project is attached to a stakeholder network (Granovetter, 1985). The need for information and resources makes the projects dependent on the external sources (e.g. from other projects or the parent organization). In other words, the embeddedness is the project´s interdependency on its stakeholders (Pfeffer & Salancik, 1977). The embeddedness scale was assessed through four items that were specifically developed for this study. The items had a stem ”to what extent...“ and included “the execution of sub-project was dependent on the external stakeholders”, “project had connections to other organizations”, “other organizations participated in the project as equal partners” and “project had external stakeholders that had influence on its execution”.

Cross-Functional Participation. Cross-functional participation refers to the level of involvement of expertise from different functions in the project. Based on the prior studies on cross-functional collaboration (De Luca & Atuahene-Gima, 2007; Li & Calantone, 1998), we developed a two-item scale to measure cross-functional participation. The items had a stem ”to what extent...“ and included “the key participants of the project included those functions and units that the project had impact on” and “the key participants of the project included a diverse set of experts from different areas of expertise”.

Top-Management Control. Top-management control refers to the formal and informal routines and procedures upper-management use to maintain or alter patterns in organizational activities (Simons, 1991). The top-management control concept covered two specific dimensions: process control and outcome control (Bonner et al., 2002; Eisenhardt, 1985; Ouchi, 1979; Poskela & Martinsuo,

2009). The measurement of process control included the following two items: "upper-management of the organization followed that the project proceeded according to initial plan" and "upper-management of the organization made sure that defined procedures were followed in the project", modified from Ramaswami (1996). The outcome control was measured through the following item: "upper-management of the organization evaluated the outcomes of the project".

Project Performance. Project performance refers to the extent to which the project was able to produce pre-planned outcomes and how well these outcomes corresponded to expectations of the parent organization (Andersen, 2008). Project performance was assessed *via* five items developed for this study. The items were "project met its content-related goals very well", "the outcomes of the project were high in quality", "the outcomes of the project were implemented easily in the customer organization", "the outcomes of the project responded with the needs of the customer organization" and "project was economically successful".

Overview of the Analyses

The data analysis included three phases. In the first phase, an explorative principal component factor analysis with latent root criterion was executed with Quartimax rotation on a total of 24 boundary-management items. The items were modified from Ancona and Caldwell (1992) for the purposes of this study. Following the process of explorative factor analysis proposed by Hair et al. (2010), we eliminated initial variables one by one, removing items with communalities less than the proposed +/- 0.50 value (Hair et al., 2010). We also removed indicators with high cross-loadings on several factors. The analysis produced a final factor solution with four factors. To assess the validity of the factor structure, we also conducted confirmatory factor analysis (CFA) with maximum likelihood estimation.

In the second phase of the analysis, we replaced the initial hypothesized model with four identified boundary-management activities. We first calculated bivariate correlations between all study variables. Next, following the process suggested by Hair et al. (2010), we tested the fit and construct validity of the proposed model by conducting confirmatory factor analysis for the entire model. Finally, the hypothesized relations between antecedent factors, boundary-management activities and project performance were analyzed using structural equation modeling. During the third phase of analysis, we compared results of the initial model with the seven alternative models. The objective of this rather explorative phase was to improve the model fit by identifying potential interdependencies between the selected boundary-management activities. The analysis of the interdependencies between boundary-management activities resulted in re-specification of the original structural equation model.

Results

Boundary-Management Activities

Table 2 displays the results of the explorative factor analysis for boundary-management activities. Although the questionnaire items were largely based on the ones used in the study of Ancona and Caldwell (1992), the factor solution was only partially similar to the one that they identified. The final factor structure included four clear factors based on the total of 12 indicators. Barlett's test of sphericity for the final factor solution was significant ($\chi^2 = 1087.17$, $p < 0.000$), indicating that the result of factor analysis was appropriate. The Kaiser-Meyer-Olkin measure of sampling adequacy (MSA) was 0.78 for the overall factor solution, which could be considered satisfactory (Hair, 2010). The variable specific MSA values were all above 0.67, and therefore, did not suggest any other variables for deletion. The extracted factor solution explained 70.2% of the total variance. In addition, the communalities for each variable (Table 2) were all above 0.60, as suggested by Hair et al. (2010).

Table 2. Rotated (Varimax) Factor Loadings for Boundary-Management Activities

		Factor loadings			
	Items	**1**	**2**	**3**	**4**
B1	Engage representatives of parent organization to participate project planning	.86			
B2	Negotiate on project´s role and relation to other activities in the parent organization	.87			
B3	Negotiate the content of the project with representatives from the parent organization	.81			
B4	Avoid releasing information to others in the parent organization to protect the project´s image		.77		
B5	Control the release of information from the project in an effort to present the profile we want to		.84		
B6	Keep the news about the project secret from others in the parent organization until the appropriate time		.82		
B7	Create and sustain good contacts with the parent organization			.67	
B8	Report the progress of the project to a higher organizational level			.76	
B9	Inform the parent organization about the existence and goals of the project			.66	
B10	Assure the parent organization that the project is proceeding well			.65	
B11	Negotiate with others (representatives of the parent organization) for delivery deadlines				.79
B12	Solve emerging problems with others (representatives of the parent organization)				.84

N = 236. Principal component factor extraction method with Kaiser normalization.

Quartimax rotation method.

Loadings less than .40 are not shown.

Note: Scales are translations.

The factor solution showed that the first factor accounted for 34.31% of the total variance. The first factor is based on three items that represent practices that aim at engaging and participating individuals from the parent organization into planning and execution of the project. This is done in order to get necessary support and to acquire information that is critical for the successful accomplishment of the project. This factor includes elements from both task coordinator and scout activities identified by Ancona and Caldwell (1992). We labeled this factor "*Enabling"* activity because it comprises practices through which project managers try to develop a prosperous environment for the project to succeed. The enabling activities resemble what Druskat and Wheeler (2003) called the relating behavior of leaders. Their study on work teams showed that leaders with superior performance recognized the significance of social and political awareness of the larger organization and developed access to individuals and functions that allowed them to obtain information that was critical for team performance (Druskat & Wheeler, 2003).

The second factor accounted for 16.99% of the total variation. This factor corresponded to the one found by Ancona and Caldwell (1992) and included behaviors that aimed at limiting the information delivery from project to parent organization in order to protect project teams. Following the example of Ancona and Caldwell, we labeled this factor "*Guarding"* activity. This factor included the same three items identified by Ancona and Caldwell (1992).

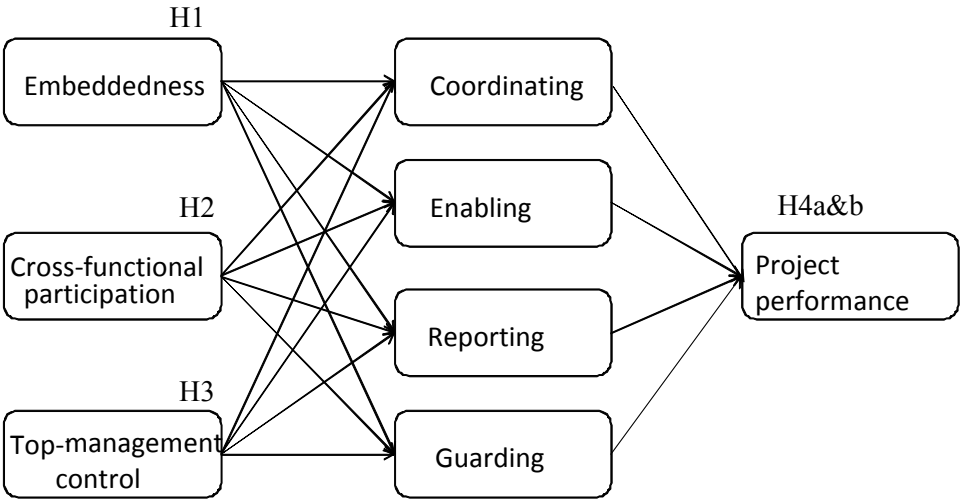
The third factor accounted for 10.13% of total variance. It was made up of four items describing behaviors that included reporting and informing the parent organization about goals and progress of the project, and sustaining good contacts with the parent organization. We labeled this factor "*Reporting*" activity, as it mainly described project managers' roles in delivering information in the form of reports. Reporting activities aim at acquiring the attention and support of top management and thereby ensure the successful execution of the project. Reporting activity is well aligned with the findings of the study by Lehtonen and Martinsuo (2008), in which they analyzed boundary-management activities during

the initiation phase of a change program. They found that, through communicating about the plans and progress, program managers attempted to convince top management and employees of the necessity of the program and thereby create legitimacy and support for program execution (Lehtonen & Martinsuo, 2008).

The fourth factor accounted for 8.79% of the total variance and represented actions that aimed at negotiating and solving challenges in cooperation with the parent organization. We labeled the two items that defined this factor *"Coordinating"* activities because the two items were a part of the task coordinator activity identified by Ancona and Caldwell (1992). Prior studies have shown that these activities are closely related to cross-functional projects, where negotiation between different functions and groups is prerequisite for successful project execution (Ancona & Caldwell, 1992).

From the four identified boundary-management activities (illustrated in Figure 2), only guarding activities seemed to be related to isolating the project from the environment (see Ancona and Caldwell, 1992), while the other three clearly aimed at creating interactions between the project and the environment (Guinan, Cooprider, & Faraj, 1998).

Figure 2. Hypothesized Model with Boundary-Management Activities[a]



a. Boundary activities added to the initial model. Hypothesis H4 includes all of the identified paths from boundary-management activities to project performance. Hypotheses H1-H3 include the paths from the respective antecedent factor (embeddedness [H1], cross-functional participation [H2], top-Management control [H3]) to all four identified Boundary-Management activities.

Because the resulting factor solution did not fully correspond to the one identified in prior studies, we decided to test the factor structure of the identified boundary management activities through confirmatory factor analysis (CFA). Although the resulting χ^2 value (94.397) for the four factor model was significant at a 0.001 level (n= 236, df = 48), the normed fit index (CFI) value was 0.95, which could be considered as an acceptable fit (Hu, Bentler, & Kano, 1999). Additionally, an RMSEA value of 0.06 and a 90% RMSEA confidence interval (0.04-0.08) gave an indication of a mediocre fit (MacCallum, Browne, & Sugaware, 1996). Based on the explorative and confirmatory factor analyses, we replaced the general term with the four separate activities identified through the explorative factor analysis (Figure 2).

Antecedent Factors, Boundary-Management Activities and Project Performance

Table 3 reports descriptive statistics and correlations among all study variables. As shown in the table, most of the scales possessed the generally agreed lower limit of 0.70 for Cronbach's Alpha (Hair et al., 2010). Two of the variables, reporting and interdependency, had Alpha values of 0.69. However, as both of the scales were specifically developed for the purposes of this study and were close to threshold values, these could be considered acceptable (Robinson, Shaver, & Wrightsman, 1991).

Table 3. Means, Standard Deviations and Correlations for Study Variables[a]

	Variable	Mean	s.d.	1	2	3	4	5	6	7	8
1	Enabling activities	3.35	0.85	(.87)							
2	Guarding activities	1.85	0.76	.08	(.76)						
3	Reporter activities	3.54	0.70	.46**	.14*	(.69)					
4	Coordinating activities	2.97	0.92	.44**	.14*	.45**	(.77)				
5	Embeddedness	3.00	0.85	.30**	.06	.26**	.24**	(.69)			
6	Cross-functional participation	4.14	0.73	.20**	-.18**	.20**	.06	.06	(.72)		
7	Top-management control	2.97	0.79	.24**	.13**	.47**	.33**	.07	.15**	(.74)	
8	Project performance	3.93	0.72	.09	-.09	.14*	-.03	.03	.15**	.12*	(.84)

a. n = 236. In this table boundary-management variables (1-4) represent arithmetic means of items loaded (loadings > 0.40) in each factor.

Coefficients of alpha reliabilities are on the diagonal in parentheses.

*p < .05, ** p < .01.

To analyze psychometric properties of the hypothesized model (Figure 2), we conducted confirmatory factor analysis for the whole model. The model included the four boundary-management activity constructs identified in the explorative factor analysis, the three antecedent factors constructs, and one performance construct. The χ^2 for the model was significant ($p < 0.00$), but the fit

indices were only at an adequate level (CFI (0.945), RMSEA (0.04), and 90% RMSEA confidence interval 0.03-0.05 (Hu and Bentler, 1999)). The convergent validity of the model was assessed through examination of standardized loadings and residuals. All of the standardized loading estimates were statistically significant and above the proposed 0.50 cutoff value, and all of the standardized residuals were below the absolute cutoff value of 4.0, thus providing support for acceptable convergent validity. Furthermore, composite reliabilities for latent variables were between 0.63 and 0.89, indicating acceptable internal consistency of measurement scales (Hair et al., 2010). Based on the discussion above, we could conclude that the psychometric properties of the measurement model were at an acceptable level.

After the confirmatory factor analysis, we specified and tested the hypothesized structural equation model with the boundary-management activities identified in the explorative factor analysis (see Figure 2). The χ^2 for the initial hypothesized model was 245.29 with 280 degrees of freedom ($p < 0.00$). The model CFI was 0.93, IFI was 0.93, RMSEA was 0.04, and a 90% RMSEA confidence interval of 0.03 to 0.05 was found. The results indicated adequate fit.

The standardized path estimates lent support for hypothesis 1. All path estimates from embeddedness to boundary-management activities (enabling, reporting, guarding, and coordinating) were positive and statistically significant ($\beta = .48$, $\beta = .42$, $\beta = .19$, and $\beta = .42$, respectively). In addition, hypothesis 3 was also supported. Path coefficients from top-management control to all interface management activities (enabling, reporting, guarding, and coordinating) were positive and statistically significant ($\beta = .32$, $\beta = .64$, $\beta =. 24$, and $\beta = .48$, respectively). In other words, the higher the embeddedness and top-management control, the more project managers were engaged with all boundary-management activities.

Our results lent only partial support to hypothesis 2 because cross-functional participation had a positive influence on only enabling activities ($\beta = .16$) and

reporting activities (β = .15). The path from cross-functional participation to guarding activities was statistically significant, but negative (β = -.29), and the path to coordinating activities was non-significant. The results also revealed that hypothesis 4a, predicting a negative relationship between isolating boundary-management activities and project performance, was supported, as the path from guarding activities to project performance was significant and negative (β = -.16, $p < .05$). Moreover, our findings lent only partial support for hypothesis 4b, predicting a positive relationship between boundary activities aimed at advancing project-environment interactions and project performance. The path estimates in Figure 3 showed that reporting activities had a positive impact on project performance (β = .38, $p < .001$), but the path from coordinating activities to project performance was significant and negative (β = -.27, $p < .001$). Furthermore, performing enabling activities did not have a significant impact on project performance.

As an exploratory investigation, seven alternative structural equation models were tested and compared to the original model in order to improve the fit between the model and the data. Because we did not find a significant relation between enabling activities and project performance, we decided to analyze the relationship of the enabling with the other boundary-management activities. We generated seven alternative models by adding one-by-one paths from enabling activities to other boundary-management activities. All alternative models were then compared to the initial model based on χ^2-statistics, CFI and RMSEA values. The statistics related to the initial and alternative models are presented in Table 4.

Table 4. Key Statistics of Initial and Alternative Structural Equation Models

Model	χ^2(df)	$\Delta\chi^2$(df)[a]	CFI	RMSEA	Changes to model 1
Initial model 1	425,29(280)	-	.93	.04	-
Alternative model 2	420.85(279)	4.44(1)*	.93	.04	Path Enabling-> Reporting added
Alternative model 3	425,29(279)	.00(1)	.93	.04	Path Enabling-> Guarding added
Alternative model 4	412.15(279)	13.14(1)***	.93	.04	Path Enabling-> Coordinating added
Alternative model 5	420.73(278)	4.56(2)	.93	.04	Paths Enabling-> Reporting and Enabling-> Guarding added
Alternative model 6	401.80(278)	23.49(2)***	.94	.04	Paths Enabling-> Reporting and Enabling-> Coordinating added
Alternative model 7	412.00(278)	13.29(2)**	.93	.04	Paths Enabling-> Guarding and Enabling-> Coordinating added
Alternative model 8	401.25(277)	24.04(3)***	.94	.04	Paths Enabling-> Reporting, Enabling-> Guarding and Enabling-> Coordinating added

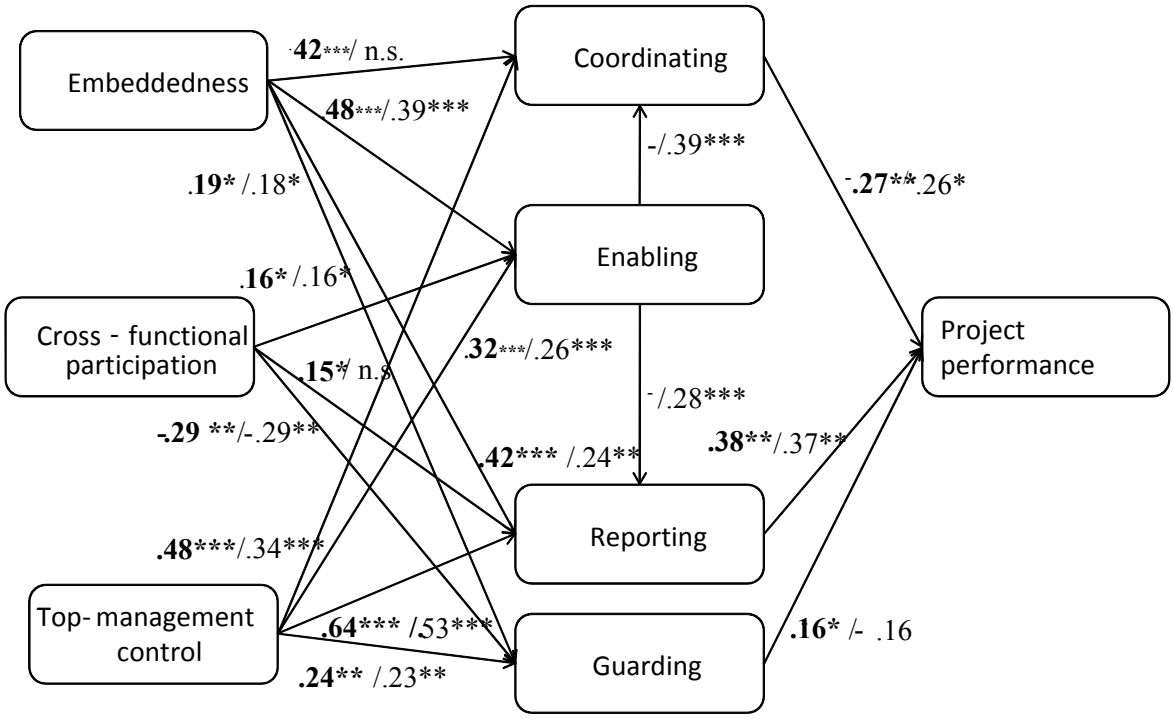
* $p < .05$, ** $p < .001$, *** $p < .0001$***.

a. All alternative models (2-8) are compared to Initial model 1.

From the seven alternative models, five improved the fit between model and data. The analysis of the alternative models indicated that adding paths from enabling activities to reporting activities and from enabling to coordinating activities had significant impact on model fit. Adding a path from enabling to guard activities, however, did not improve the model fit. Although model 8 apparently provided the best-fit statistics, a closer look at the path estimates revealed that the path from enabling to guarding activities was not significant. Therefore, model 6 seemed to fit the data best from the seven alternative mod-

els. The path coefficients of the initial structural model and alternative structural model (model 6) are presented in Figure 3.

Figure 3. Initial Structural Model (1) and Alternative Structural Model (6) with estimated path coefficients



Standardized paths. Only significant relationships among the latent variables are shown.

* p < .05, ** p< .01, *** p < .001. Note: The first, bolded number in the path estimates is related to the initial structural model (1) and the last number to the alternative structural model (6).

Comparison of the initial model and the alternative model revealed some interesting findings. Adding the paths from the enabling to coordinating activities or/and from the enabling to the reporting activities made the path from embeddedness to coordinating activities and the path from cross-functional coordinating to reporting activities non-significant. This, when compared to results from bi-variate correlations, suggested that enabling activities mediated the relationship between embeddedness and coordinating activities and the relationship between cross-functional participation and the reporting activities. In other

words, cross-functional participation and embeddedness both predicted project managers' engagement behavior. The engaging activity, again, had positive influence on coordinating and reporting activities. These two activities, coordinating and reporting, however, had opposite impacts on project performance. That is, engagement of the parent organization will have diversified indirect influence on the performance of the project through coordinating and reporting.

Discussion and Contribution

In this study, we have shown how three specific antecedent factors (embeddedness, cross-functional participation and top-management control) shape the use of the different boundary-management activities. As prior studies have either mostly focused on team internal characteristics or have been purely theoretical in nature (Marrone, 2010; Marrone et al., 2007; Choi, 2002; Joshi et al., 2009), this study provides a valuable theoretical contribution by exploring how factors external to the project (embeddedness and top-management control), as well as team design factors (cross-functional participation), influence the boundary-management activities of project managers and thereby, project performance.

Additionally, we have identified four distinct boundary-management activities undertaken by project managers, namely enabling, guarding, reporting and coordinating activities. The four identified boundary-management activities were partly similar to those found by Ancona and Caldwell (1992) and Druskat and Wheeler (2003), and therefore complement the existing understanding of the boundary roles of project managers. However, as the boundary-management activities identified by prior studies were either based on only a few organizations (Druskat & Wheeler, 2003) or resulted in activities in which measurement indicators were characterized by high cross-factor loadings (Ancona & Caldwell, 1992), our study provides expected empirical validation of the boundary activities and their measurement scale.

Finally, our study revealed that from the four identified boundary-management activities, only reporting activities had direct positive influence on project performance, while coordinating and guarding activities had direct negative effects on project performance. In addition, enabling activities had both indirect negative and positive influences on project performance through coordinating and reporting activities. Our findings on guarding and reporting activities were aligned with the prior studies of Ancona and Caldwell (1992) and Guinan et al. (1998), but the identified negative relationship between coordinating activities and project performance provided different results from what was expected based on the existing studies. One plausible explanation for the identified negative relationship could be that a high level of engagement in external negotiation activities may reduce the time project managers spend ensuring cohesion and smooth collaboration between interdependent sub-project teams. This would lead to the development of overly strong team identities and weak project identity, emergence of communication boundaries, and conflicting team objectives and priorities between sub-project teams (Hoegl et al., 2004). This could result in conflicts and inefficiencies in project execution and thereby reduce project performance.

Managerial Implications

From the managerial point of view our, results provide a helpful model for top-management and project managers to understand the complex interplay between project design parameters, boundary-management activities and project performance. One focal question related to execution of a project is how much autonomy should be given to a project with respect to its goals and execution process. Some of the prior studies have argued that autonomy was a favorable state in the case of highly innovative projects (Druskat & Wheeler, 2003; McGrath, 2001). Our study revealed that controlling goals and execution processes shifted project managers´ activities from the team towards management of external relations. This again has, according to our results, both negative and positive influences on project performance. The positive influence comes from

the reporting activities that provide incentives for project managers to keep the project on track and ensure that the goals and achievements are aligned with the stakeholder expectations. On the other hand, controlling has indirect negative influence on performance through coordinating and guarding activities. Excessive control may lead project managers either to isolate the project from the environment to control external disturbances and thereby minimize changes that could be harmful for project execution, or it may lead project managers to put excessive effort into negotiating with different stakeholders and thereby not give enough focus to internal management functions. Thus, even though boundary-management activities have been recommended by many prior studies without further critique (Ancona & Caldwell, 1992; Guinan et al., 1998), we suggest managers consider how much time they are willing to invest in externally oriented boundary-management activities at the expense of a project's internal managerial duties. As our results indicate, management of project boundaries is often a double-edged sword that may, if not well balanced with internal activities, lead to decreased performance.

Limitations

There are at least three focal limitations in our study that should be considered when interpreting the findings. First, the use of retrospective data from completed projects may have biased the presented results. To counter such potential bias, we specifically asked respondents to identify a project that was completed within one year, in order to be able to make a reliable assessment of performance. Second, the relatively low response rate may have caused bias when it came to generalizability of the results. To identify such bias, we compared the answers of early and late respondents to determine if these two groups differed significantly. However, the analysis did not reveal significant differences. Furthermore, in our sample the largest part of the projects represented organizational development, and therefore, the special characteristics of organizational development may have dominated. Third, given our cross-sectional data, we could not identify how the importance of boundary-management activities

changed over the project's lifecycle. It may be that some of the boundary-management activities were more critical during the project initiation phase and less important later on (Lehtonen & Martinsuo, 2008). This issue, however, remains unsolved in this study, but provides a fruitful direction for future research. Future studies might also examine boundary-management in projects from the network perspective. Interesting issues to be solved could be what kinds of networks are utilized by project managers for boundary management during project execution and how the different project characteristics, such as uncertainty and complexity (Shenhar & Dvir, 2007), influence the network structures.

APPENDIX A: QUESTIONNAIRE ITEMS

Boundary management activities

To what extent are you, as a key person responsible for the project, were engaged in the following activities (scale 1 = not at all... 5 = to a great extent)?

1. Engage representatives of parent organization to participate in project planning.
2. Negotiate on project´s role and relation to other activities in the parent organization.
3. Negotiate the content of the project with the representatives from the parent organization.
4. Avoid releasing information to others in the parent organization to protect the project´s image.
5. Control the release of information from the project in an effort to present the profile we want to.
6. Keep the news about the project secret from others in the parent organization until the appropriate time.
7. Create and sustain good contacts with the parent organization.
8. Report the progress of the project to a higher organizational level.
9. Inform the parent organization about the existence and goals of the project.
10. Assure the parent organization that the project is proceeding well.
11. Negotiate with others (representatives of the parent organization) for delivery deadlines.
12. Solve emerged problems with others (representatives of the parent organization).

Embeddedness

To what extent... (scale 1 =not at all... 5 = to a great extent)

13. Did the project have connections to other organizations?
14. Did other organizations participated in the project execution?
15. Did the project have external stakeholders that had influence?
16. Was the execution of sub-projects dependent on the external stakeholders?

Cross-functional participation

To what extent... (scale 1 =not at all... 5 = to a great extent)

17. Did the key participants of the project include those functions and units that the project had an impact on?
18. Did the key participants of the project include a diverse set of experts with different areas of expertise?

Top-management control

To what extent... (scale 1 =not at all... 5 = to a great extent)

19. Did upper-management of the organization understand that the project was proceeding according to the initial plan?
20. Did upper-management of the organization make sure that defined procedures were followed in the project?
21. Did upper-management of the organization evaluate the outcomes of the project?

Project performance

To what extent... (scale 1 = not at all... 5 = to a great extent)

22. Did the project meet its content-related goals very well?
23. Were the outcomes of the project high in quality?

24. Were the outcomes of the project implemented easily in the customer organization?
25. Did the outcomes of the project respond to the needs of the customer organization?
26. Was the project economically successful?

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8/00	Finn Olesen	*Jørgen Henrik Gelting – En betydende dansk keynesianer*
9/00	Frank Jensen Niels Vestergaard	*Moral Hazard Problems in Fisheries Regulation: The Case of Illegal Landings*
10/00	Finn Olesen	*Moral, etik og økonomi*

11/00	Birgit Nahrstedt	*Legal Aspect of Border Commuting in the Danish-German Border Region*
12/00	Finn Olesen	*Om Økonomi, matematik og videnskabelighed - et bud på provokation*
13/00	Finn Olesen Jørgen Drud Hansen	*European Integration: Some stylised facts*
14/01	Lone Grønbæk	*Fishery Economics and Game Theory*
15/01	Finn Olesen	*Jørgen Pedersen on fiscal policy - A note*
16/01	Frank Jensen	*A Critical Review of the Fisheries Policy: Total Allowable Catches and Rations for Cod in the North Sea*
17/01	Urs Steiner Brandt	*Are uniform solutions focal? The case of international environmental agreements*
18/01	Urs Steiner Brandt	*Group Uniform Solutions*
19/01	Frank Jensen	*Prices versus Quantities for Common Pool Resources*
20/01	Urs Steiner Brandt	*Uniform Reductions are not that Bad*
21/01	Finn Olesen Frank Jensen	*A note on Marx*
22/01	Urs Steiner Brandt Gert Tinggaard Svendsen	*Hot air in Kyoto, cold air in The Hague*
23/01	Finn Olesen	*Den marginalistiske revolution: En dansk spire der ikke slog rod?*
24/01	Tommy Poulsen	*Skattekonkurrence og EU's skattestruktur*
25/01	Knud Sinding	*Environmental Management Systems as Sources of Competitive Advantage*
26/01	Finn Olesen	*On Machinery. Tog Ricardo fejl?*
27/01	Finn Olesen	*Ernst Brandes: Samfundsspørgsmaal - en kritik af Malthus og Ricardo*
28/01	Henrik Herlau Helge Tetzschner	*Securing Knowledge Assets in the Early Phase of Innovation*

29/02	Finn Olesen	*Økonomisk teorihistorie* *Overflødig information eller brugbar ballast?*
30/02	Finn Olesen	*Om god økonomisk metode* *– beskrivelse af et lukket eller et åbent socialt system?*
31/02	Lone Grønbæk Kronbak	*The Dynamics of an Open Access: The case of the Baltic Sea Cod Fishery – A Strategic Approach -*
32/02	Niels Vestergaard Dale Squires Frank Jensen Jesper Levring Andersen	*Technical Efficiency of the Danish Trawl fleet: Are the Industrial Vessels Better Than Others?*
33/02	Birgit Nahrstedt Henning P. Jørgensen Ayoe Hoff	*Estimation of Production Functions on Fishery: A Danish Survey*
34/02	Hans Jørgen Skriver	*Organisationskulturens betydning for vidensdelingen mellem daginstitutionsledere i Varde Kommune*
35/02	Urs Steiner Brandt Gert Tinggaard Svendsen	*Rent-seeking and grandfathering: The case of GHG trade in the EU*
36/02	Philip Peck Knud Sinding	*Environmental and Social Disclosure and Data-Richness in the Mining Industry*
37/03	Urs Steiner Brandt Gert Tinggaard Svendsen	*Fighting windmills? EU industrial interests and global climate negotiations*
38/03	Finn Olesen	*Ivar Jantzen – ingeniøren, som beskæftigede sig med økonomi*
39/03	Finn Olesen	*Jens Warming: den miskendte økonom*
40/03	Urs Steiner Brandt	*Unilateral actions, the case of international environmental problems*
41/03	Finn Olesen	*Isi Grünbaum: den politiske økonom*
42/03	Urs Steiner Brandt Gert Tinggaard Svendsen	*Hot Air as an Implicit Side Payment Arrangement: Could a Hot Air Provision have Saved the Kyoto-Agreement?*

43/03	Frank Jensen Max Nielsen Eva Roth	*Application of the Inverse Almost Ideal Demand System to Welfare Analysis*
44/03	Finn Olesen	*Rudolf Christiani – en interessant rigsdagsmand?*
45/03	Finn Olesen	*Kjeld Philip – en økonom som også blev politiker*
46/03	Urs Steiner Brandt Gert Tinggaard Svendsen	*Bureaucratic Rent-Seeking in the European Union*
47/03	Bodil Stilling Blichfeldt	*Unmanageable Tourism Destination Brands?*
48/03	Eva Roth Susanne Jensen	*Impact of recreational fishery on the formal Danish economy*
49/03	Helge Tetzschner Henrik Herlau	*Innovation and social entrepreneurship in tourism - A potential for local business development?*
50/03	Lone Grønbæk Kronbak Marko Lindroos	*An Enforcement-Coalition Model: Fishermen and Authorities forming Coalitions*
51/03	Urs Steiner Brandt Gert Tinggaard Svendsen	*The Political Economy of Climate Change Policy in the EU: Auction and Grandfathering*
52/03	Tipparat Pongthanapanich	*Review of Mathematical Programming for Coastal Land Use Optimization*
53/04	Max Nielsen Frank Jensen Eva Roth	*A Cost-Benefit Analysis of a Public Labelling Scheme of Fish Quality*
54/04	Frank Jensen Niels Vestergaard	*Fisheries Management with Multiple Market Failures*
55/04	Lone Grønbæk Kronbak	*A Coalition Game of the Baltic Sea Cod Fishery*

56/04	Bodil Stilling Blichfeldt	*Approaches of Fast Moving Consumer Good Brand Manufacturers Product Development "Safe players" versus "Productors": Implications for Retailers' Management of Manufacturer Relations*
57/04	Svend Ole Madsen Ole Stegmann Mikkelsen	*Interactions between HQ and divisions in a MNC* *- Some consequences of IT implementation on organizing supply activities*
58/04	Urs Steiner Brandt Frank Jensen Lars Gårn Hansen Niels Vestergaard	*Ratcheting in Renewable Resources Contracting*
59/04	Pernille Eskerod Anna Lund Jepsen	*Voluntary Enrolment – A Viable Way of Staffing Projects?*
60/04	Finn Olesen	*Den prækeynesianske Malthus*
61/05	Ragnar Arnason Leif K. Sandal Stein Ivar Steinshamn Niels Vestergaard	*Actual versus Optimal Fisheries Policies: An Evaluation of the Cod Fishing Policies of Denmark, Iceland and Norway*
62/05	Bodil Stilling Blichfeldt Jesper Rank Andersen	*On Research in Action and Action in Research*
63/05	Urs Steiner Brandt	*Lobbyism and Climate Change in Fisheries: A Political Support Function Approach*
64/05	Tipparat Pongthanapanich	*An Optimal Corrective Tax for Thai Shrimp Farming*
65/05	Henning P. Jørgensen Kurt Hjort-Gregersen	*Socio-economic impact in a region in the southern part of Jutland by the establishment of a plant for processing of bio ethanol*
66/05	Tipparat Pongthanapanich	*Options and Tradeoffs in Krabi's Coastal Land Use*

67/06	Tipparat Pongthana-panich	*Optimal Coastal Land Use and Management in Krabi, Thailand: Compromise Programming Approach*
68/06	Anna Lund Jepsen Svend Ole Madsen	*Developing competences designed to create customer value*
69/06	Finn Olesen	*Værdifri samfundsvidenskab? - nogle refleksioner om økonomi*
70/06	Tipparat Pongthana-panich	*Toward Environmental Responsibility of Thai Shrimp Farming through a Voluntary Management Scheme*
71/06	Finn Olesen	*Rational Economic Man og Bounded Rationality – Nogle betragtninger over rationalitetsbegrebet i økonomisk teori*
72/06	Urs Steiner Brandt	*The Effect of Climate Change on the Probability of Conservation: Fisheries Regulation as a Policy Contest*
73/06	Urs Steiner Brandt Lone Grønbæk Kronbak	*Robustness of Sharing Rules under Climate Change. The Case of International Fisheries Agreements*
74/06	Finn Olesen	*Lange and his 1938-contribution – An early Keynesian*
75/07	Finn Olesen	*Kritisk realisme og post keynesianisme.*
76/07	Finn Olesen	*Aggregate Supply and Demand Analysis – A note on a 1963 Post Keynesian Macroeconomic textbook*
77/07	Finn Olesen	*Betydningen af Keynes' metodologi for aktuel makroøkonomisk forskning – En Ph.D. forelæsning*
78/08	Urs Steiner Brandt	*Håndtering af usikkerhed og betydningen af innovationer i klimaproblematikken: Med udgangspunkt i Stern rapporten*
79/08	Lone Grønbæk Kronbak Marko Lindroos	*On Species Preservation and Non-Cooperative Exploiters*

80/08	Urs Steiner Brandt	*What can facilitate cooperation: Fairness, ineaulity aversion, punishment, norms or trust?*
81/08	Finn Olesen	*Heterodoks skepsis – om matematisk formalisme i økonomi*
82/09	Oliver Budzinski Isabel Ruhmer	*Merger Simulation in Competition Policy: A Survey*
83/09	Oliver Budzinski	*An International Multilevel Competition Policy System*
84/09	Oliver Budzinski Jürgen-Peter Kretschmer	*Implications of Unprofitable Horizontal Mergers: A Positive External Effect Does Not Suffice To Clear A Merger!*
85/09	Oliver Budzinski Janina Satzer	*Sports Business and the Theory of Multisided Markets*
86/09	Lars Ravn-Jonsen	*Ecosystem Management – A Management View*
87/09	Lars Ravn-Jonsen	*A Size-Based Ecosystem Model*
88/09	Lars Ravn-Jonsen	*Intertemporal Choice of Marine Ecosystem Exploitation*
89/09	Lars Ravn-Jonsen	*The Stock Concept Applicability for the Economic Evaluation of Marine Ecosystem Exploitation*
90/09	Oliver Budzinski Jürgen-Peter Kretschmer	*Horizontal Mergers, Involuntary Unemployment, and Welfare*
91/09	Finn Olesen	*A Treatise on Money – et teorihistorisk case studie*
92/09	Jurijs Grizans	*Urban Issues and Solutions in the Context of Sustainable Development. A review of the literature*
93/09	Oliver Budzinski	*Modern Industrial Economics and Competition Policy: Open Problems and Possible limits*

94/09	Thanh Viet Nguyen	*Ecosystem-Based Fishery Management: A Critical Review of Concepts and Ecological Economic Models*
95/09	Finn Olesen	*History matters – om især den tyske historiske skole*
96/09	Nadine Lindstädt	*Multisided Media Markets: Applying the Theory of Multisided Markets to Media Markets*
97/09	Oliver Budzinski	*Europäische Medienmärkte: Wettbewerb, Meinungsvielfalt und kulturelle Vielfalt*
98/10	Niels Vestergaard Kristiana A. Stoyanova Claas Wagner	*Cost-Benefit Analysis of the Greenland Offshore Shrimp Fishery*
99/10	Oliver Budzinski Jurgen-Peter Kretschmer	*Advertised Meeting-the-Competition Clauses: Collusion Instead of Price Discrimination*
100/10	Elmira Schaimijeva Gjusel Gumerova Jörg Jasper Oliver Budzinski	*Russia's Chemical and Petrochemical Industries at the Eve of WTO-Accession*
101/10	Oliver Budzinski	*An Institutional Analysis of the Enforcement Problems in Merger Control*
102/10	Nadine Lindstädt	*Germany's PSB going online – is there an economic justification for Public Service Media online?*
103/10	Finn Olesen	*Paul Davidson: Om Keynes – en kommenterende boganmeldelse*
104/10	Liping Jiang	*Price Formation of Dry Bulk Carriers in the Chinese Shipbuilding Industry*
105/10	Lisbeth Brøde Perttu Dietrich	*Knowledge Communication in Product Development Projects*
106/10	Perttu Dietrich Lisbeth Brøde	*Boundary Management in Projects: Antecedents, Activities and Performance*