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Behavior of internal stakeholders in project portfolio management and its impact on success

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Abstract

Stakeholder behavior and stakeholder management are key success factors within project portfolio management (PPM). This empirical study of 197 project portfolios investigates the effect of the intensity of engagement (IoE) of portfolio-internal stakeholders on project portfolio success. We show that the effect of stakeholders is phase-specific and that role clarity as a measure of PPM maturity affects the nature of the relationship between the IoE of stakeholders and portfolio success. The effects of the IoE of senior managers on success are not clearly positive with regard to strategic portfolio structuring and are even negative in operative portfolio steering in established PPM systems. In immature PPM systems, line managers tend to take advantage of their position in resource management. Surprisingly, the influence of portfolio managers in portfolio steering is insignificant. Altogether, this paper shows the diverse effect of the IoE of stakeholders on portfolio success. This study enriches project research by applying stakeholder theory to the project portfolio context and offers practical guidance for further professionalizing PPM.
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Keywords: Project portfolio management; Stakeholder management; Stakeholder behavior; Project portfolio success

1. Introduction

Increasingly, companies have driven the projectification of their activities, which has been reflected in substantially increasing shares of spending for project-organized ventures (Dahlgren and Söderlund, 2010; Lundin, 2011). However, the assumed advantage in the controllability of single projects comes along with a loss of transparency and thus the effectiveness of the entire collection of projects in a firm (Elonen and Artto, 2003). Therefore, companies that handle numerous projects simultaneously require a structured management approach for project portfolios, and project portfolio management (PPM) thus becomes a key competence to implement strategies and remain competitive (Dietrich and Lehtonen, 2005; Killen et al., 2008; Martinsuo and Lehtonen, 2007).

Both research and practice suggest that stakeholders with the ability to influence projects play a crucial role in the successful management of projects (Aaltonen, 2011; Assudani and Kloppenborg, 2010; Wang and Huang, 2006). Moreover, in the professional and academic management literature, a common view is that stakeholder management and performance are strongly related (Donaldson and Preston, 1995). Additionally, stakeholders and their interests may be affected by projects or project outcomes; thus, from an ethics and sustainable management perspective, they must not be ignored in project management, which is reflected in some definitions of project success (Freeman et al., 2007; Turner, 2009).

For programs of projects, which can be understood as a specific type of project portfolio (Artto and Dietrich, 2004, rephrased from OGC, 2003), the crucial relevance of stakeholders in successful management has been discussed in the literature (Lycett et al., 2004; Pellegrinelli et al., 2007). In fact, Lycett et al. (2004) view stakeholder management as the basis of effective program management. Stakeholder management as

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a discipline has been integrated into program management guidelines (e.g., Pellegrinelli, 2008; PMI, 2008b), although research on the topic remains relatively scarce.

Building on the literature on project, program, and general management, we argue that the relevance of stakeholders for success also applies to project portfolio management, which is supported by the work of several scholars (Levine, 2005; Turner, 2009). The management of an entire portfolio of projects is a distributed process (Jonas, 2010) that is often located in more than one organizational unit and thus directly or indirectly involves, affects, and is affected by several groups and individuals. Hence, not only stakeholders of single projects affect the success of a portfolio but also stakeholders of the portfolio as a whole who are either directly involved in the PPM process, can influence the success of the portfolio otherwise, or are affected by the portfolio.

Scholars in stakeholder research have developed various conceptualizations and definitions of stakeholders (for an overview, see Mitchell et al., 1997). However, the pioneer work of Freeman (1984) defined a stakeholder as "any group or individual who can affect or is affected by the achievement of the organization's objectives" (p. 46; similar wording in Freeman et al., 2010), and this definition is still widely used and forms the basis for many other definitions. Thus, drawing on stakeholder theory, we define *project portfolio stakeholders* as any group or individual in a relationship with a project portfolio, such that the group or individual can affect or is affected by the achievement of the portfolio's objectives (similar definition for program management in PMI, 2006). Because PPM is a distributed process (Jonas, 2010), in one context related parties can be part of the management of "the organization" (in Freeman's, 1984, hub and spoke definition) that manages (for) stakeholders. In another context, those related parties can be stakeholders. Therefore, the portfolio (and its objectives and decision making) that is represented by different players in the PPM process could be perceived as being in the middle of this hub and spoke system. Hence, our stakeholder definition includes all groups that "have a stake in" such a portfolio acknowledging that these groups may also be part of the organization that is managing (for) stakeholders (Evan and Freeman, 1988, pp. 75–76). Goodpaster (1991) has noted that Freeman's definition (1984) implies the notion of two types of stakeholders: strategic (affecting) and moral (being affected). Further, Freeman (1984) differentiated with respect to organizational aspects between firm internal and external stakeholders.

The focus of this paper is on strategic stakeholders (i.e., those affecting project portfolios) while acknowledging that moral stakeholders can also become strategic over time (Goodpaster, 1991) and that, from a normative perspective, management actions should follow ethical guidelines and also serve moral stakeholders (Freeman et al., 2007). Further, we focus on portfolio-internal strategic stakeholders (i.e., those who are directly involved in the PPM process) because they constitute the core of PPM. As such, we expect these stakeholders to be a major source of influence with respect to project portfolio success. Thus, we define four strategic internal stakeholders of PPM: senior managers, mid-level line managers, project portfolio managers, and project managers.

The fairly new area of project portfolio management research has thus far focused on formalization. The extant literature focuses on describing what project portfolio management comprises or should comprise. Numerous scholars address the processes, tasks, and instruments of PPM (e.g., Cooper et al., 2001; Levine, 2005; PMI, 2008a; Teller et al., 2012). This rather technocratic view provides valuable and necessary yet insufficient knowledge for the successful management of project portfolios. As scholars have discussed in the strategic management domain (Freeman et al., 2007) and for program management (Lycett et al., 2004), also in PPM we must obtain a better understanding of stakeholders, their behavior, and its effect on success to be able to manage project portfolios effectively and efficiently. As a first step, this requires an assessment of stakeholder behavior and its consequences. As a second step, we must explain the choices of specific behavior by identifying the antecedents of stakeholder behavior.

Surprisingly little research addresses organizational stakeholder behavior in a strategic management or project context (Aaltonen and Kujala, 2010; Frooman, 1999; Rowley and Moldoveanu, 2003), and almost no studies specifically address the PPM context with very few exceptions that cover only single aspects of stakeholder behavior and PPM (e.g., Unger et al., 2012). Furthermore, the current stakeholder research provides only a limited number of empirical analyses. The described research deficits are consistent with the recommendation of Freeman and McVea (2001) to apply the insights of stakeholder theory to "real-world problems" rather than focusing entirely on the development of theory.

To address this deficit in stakeholder and project portfolio research, this article takes the first step in understanding stakeholder behavior by analyzing its consequences and posing the following general research question: *How does the behavior of internal stakeholders influence project portfolio success?* To reduce the complexity of our analysis, we divide the research question into three more specific questions.

Describing stakeholder behavior in greater detail with respect to PPM, the most basic question addresses the extent to which stakeholders engage themselves in PPM activities.

Q1. How does the intensity of engagement of stakeholders influence project portfolio success?

In this question and in the overall paper, the engagement of stakeholders refers to the involvement and activity of stakeholders themselves and not to the often used understanding as management actions to increase stakeholder involvement.

Project portfolio management definitions are often based on a process with several activity clusters, steps, or phases (e.g., Thiry, 2007). For example, Levine (2005) noted that the right stakeholders should be involved in the right PPM process steps. Thus, we ask:

Q2. How does stakeholders' influence on success vary across different PPM phases?

Because PPM is a fairly new management system that involves several internal stakeholders, we expect that stakeholder

role clarity may influence the relationship between stakeholder behavior and project portfolio success. Hence, we ask:

Q3. How is the influence of stakeholder behavior on success affected by role clarity?

We use data from a large sample of project portfolios in German, Austrian, and Swiss firms to analyze the effect of the intensity of stakeholder engagement on project portfolio success. Because the level of analysis is the portfolio level rather than the project level, the relevant stakeholders include senior managers, line managers, and project portfolio managers. Project managers are also included because they are involved in PPM and represent project teams and customer interests at the portfolio level.

The contributions of this paper are threefold. First, we contribute to stakeholder theory by applying this theory to PPM, integrating it with other management approaches and thus fostering its explanatory value and relevance. Second, the current study contributes to PPM research by helping to explain the relevance of stakeholders to PPM and shifting the current focus in the extant literature from formalization toward understanding further aspects that are critical for successful PPM. Finally, the current findings contribute to practice by enabling managers to address stakeholders more effectively through increased understanding of stakeholder behavior and its consequences. Thus, our findings also provide guidance for further establishing and professionalizing PPM.

2. Theoretical background

2.1. Project portfolio management

Project portfolios have been defined as collections of projects that are conducted under the sponsorship and/or management of a specific organization and that compete for scarce resources (Archer and Ghasemzadeh, 1999). A corresponding definition of project portfolio management has been presented by Blichfeldt and Eskerod (2008), who described the "managerial activities that relate to the initial screening, selection and prioritization of project proposals, the concurrent reprioritization of projects in the portfolio, and the allocation and reallocation of resources to projects according to priority" (p. 358). We follow this definition. Based on a process-oriented understanding of project portfolio management, the scope of managerial activities can be structured along three generic and recursive main phases: portfolio structuring, resource management, and portfolio steering. In general, firms may not necessarily accomplish all phases to the same extent and quality. However, the process model generally provides a comprehensive understanding and a differentiated view of the scope of activities and research fields that relate to project portfolio management.

(1) *Portfolio structuring* includes all initial activities that are involved in building a target portfolio using a given business strategy (Meskendahl, 2010), such as strategic portfolio planning, evaluating project proposals, and selecting projects in a considered manner. Such activities are to be conducted recurrently in alignment with a firm's (strategic) planning cycles (Platje et al., 1994). Therewith, portfolio structuring aims for strategic orientation among large project landscapes.

(2) *Resource management* connects the initial recurrent resource allocation in the portfolio structuring phase with the permanent reactive reallocation in the portfolio steering phase. It aims for the effective and efficient allocation of project resources across the entire portfolio. It refers specifically and only to resource management activities in the narrow context of project landscapes (Elonen and Artto, 2003; Hendriks et al., 1999; Martinsuo and Lehtonen, 2007), such as cross-project resource planning and project resource approvals (Arvidsson, 2009; Blichfeldt and Eskerod, 2008).

(3) *Portfolio steering* covers all ongoing activities for the continuous coordination of portfolios (Müller et al., 2008). This involves gathering information for the continuous monitoring of strategic alignment in the event of deviations from the target portfolio, developing corrective measures, coordinating projects across organizational units to identify project synergies, and detecting and canceling obsolete projects (Loch and Kavadias, 2002; Zirger and Hartley, 1996). Hence, the goal of portfolio steering is to enhance the adaptive capacity and flexibility of a firm regarding portfolio internal and external changes that may arise on short notice during a planning period (Geraldi, 2008, 2009; Spillecke, 2006).

Project portfolio success can encompass multiple dimensions and perspectives (Cooper et al., 2001; Jonas et al., 2012; Müller et al., 2008). For the purposes of this study, we concentrate on an operative short-term perspective and a strategic long-term perspective. The first perspective encompasses the cumulative success of all projects in a portfolio. Therefore, *average project success* is defined along the three familiar dimensions of the project management triangle: cost, schedule and quality (Gardiner and Stewart, 2000). Delivering projects within budget, on time, and according to specifications are well-known criteria for measuring project success (Lechler and Dvir, 2010; Pinto and Prescott, 1990; Shenhar et al., 2001). To analyze success from the portfolio perspective, we define these project success criteria as the *average* across all projects within a portfolio. There is an important difference between single project success and *average* project success across the entire portfolio. The latter is a portfolio performance criterion that is determined both by individual project characteristics and by the interdependence between projects.

For the second perspective, the literature typically applies the concept of *strategic fit* of a portfolio, which reflects the *internal* strategic fit perspective (Carmeli et al., 2010; Miller, 1996; Rivkin, 2000; Siggelkow, 2002). This perspective refers to the alignment of project objectives and resource allocation corresponding to the strategic relevance of projects (Hendriks et al., 1999; Kaplan and Norton, 2005; Meskendahl, 2010;

Payne, 1995). In the context of project portfolio management, we define strategic fit as the degree to which the objectives and demands of a portfolio's projects are consistent with the objectives and demands of the overall organizational strategy (e.g., Unger et al., 2012). This specifically refers to the alignment of project objectives, such as a project's compliance with and contribution to an intended strategy, and the alignment of project demands, such as resources that are allocated across a portfolio such that the most effective resources are provided to those projects with the highest strategic relevance (Dietrich and Lehtonen, 2005; Meskendahl, 2010).

2.2. Managing (for) stakeholders

According to Phillips et al. (2003), "stakeholder theory is a theory of organizational management and ethics" (p. 480). The basic assumption of stakeholder theory is that a firm, as represented by its management, has relationships with many constituent groups of individuals within the firm and in its external environment, and that those groups play a vital role in the firm's success, and the interests of all (legitimate) stakeholders are of intrinsic value (Clarkson, 1995; Donaldson and Preston, 1995; Freeman, 1984). Although rooted in strategic management, the stakeholder concept has been applied to other research fields, such as project management. Also in program management scholars have increasingly advocated for integrating the idea of stakeholder theory (Lycett et al., 2004); the extant literature is primarily practitioner-oriented, and empirical research remains relatively scarce.

For project portfolio management, which is closely related to program management, the standard literature and guidelines implicitly account for the relevance of stakeholders, as many of them at least mention or even address aspects of stakeholder management (e.g., PMI, 2008a; Thiry, 2007). However, in project portfolio management, research on stakeholders has received even less attention than in program management. Similar to stakeholder research in strategic management, scholars have focused on identifying stakeholders that may influence an organization's decision making, analyzing the types of claims that they have and categorizing stakeholders (e.g., Mitchell et al., 1997). In the PPM realm, the work of Jonas (2010) and the PPM standard in PMI (2008a) can be viewed as initial steps in identifying the key roles in the PPM process and assigning their targeted responsibilities. However, these first steps do not account for the claim of some scholars that we must gain a better understanding of stakeholder behavior to be able to manage stakeholders effectively (Aaltonen and Kujala, 2010; Frooman, 1999; Lycett et al., 2004). In strategic and project management, so far only a very limited number of scholars have addressed aspects of stakeholder behavior explicitly (Frooman, 1999; Frooman and Murrell, 2005; Hendry, 2005; Tsai et al., 2005; project management: Aaltonen and Kujala, 2010; Aaltonen et al., 2008). Few scholars have implicitly covered behavioral aspects, such as Mitchell et al. (1997), who presented a categorization of stakeholder salience.

Some further researchers have added relevant aspects to the general research on stakeholder behavior (e.g., on the mutual influence of stakeholders: Neville and Menguc, 2006; Rowley, 1997). To describe stakeholder behavior with respect to its effect on an organization's objectives, our thorough literature review reveals primarily two aspects. First, scholars describe whether stakeholders are supportive or are interfering and opposing with respect to a targeted achievement (e.g., Reiss et al., 2006; Savage et al., 1991). McElroy and Mills (2007) and Bourne (2009) enrich this categorization by differentiating between passive and active support or opposition as well as neutral behavior. Whereas "supportiveness" describes the direction of behavior, in the last categorization, it is already mixed with the amplitude of behavior (i.e., passive versus active). We denominate this second aspect that describes the extent of engagement as the "intensity of engagement". This aspect is reflected, for example, in the concept of stakeholder salience according to Mitchell et al. (1997) or the work of Rowley and Moldoveanu (2003) on stakeholder mobilization with degrees of engagement from passive to highly active and engaged. Thus, the intensity of engagement as an aspect of stakeholder behavior reflects the extent to which project portfolio management actions are performed by the respective stakeholders. In contrast, the influence strategies discussed by Frooman (1999) describe—on a meta-level—the "means" of stakeholder behavior to forward stakeholder interests and influence decision making. These "means" or strategies may materialize in a specific intensity of engagement and in qualitative aspects of stakeholder behavior, such as "supportiveness".

In the introduction of this paper, we based our definition of project portfolio stakeholders on the seminal work of Freeman (1984). We introduced the four strategic internal stakeholders of PPM (senior managers, mid-level line managers, project portfolio managers, and project managers) which we define in greater detail in the following section.

(1) Senior managers. According to upper echelon research, senior managers are the key decision makers of an organization (Carpenter et al., 2004; Gallén, 2009). They are assumed to surmount barriers to change by utilizing hierarchical potential (Rost et al., 2007). In the PPM context, *senior managers* must decide on processes and standards for the overall project organization in general as well as the prioritization, selection, and evaluation mechanisms. Top-level managers must approve the target portfolio from a strategic perspective. Whenever fundamental conflict situations occur or senior managers observe deviations from the target portfolio, they must deliver timely decisions for reallocating resources or reprioritizing projects. Thus, under normative conditions and given a process-oriented understanding of PPM, the key phase for senior manager engagement is the *portfolio structuring phase*.

(2) Mid-level *line managers*. Stakeholders who are below senior management but not necessarily above (and increasingly alongside) project managers can be classed with middle management. However, their position in the hierarchy of an organizational structure does not solely characterize middle management. Their uniqueness stems

from their easy access to top management combined with their knowledge of operations (Raes et al., 2011; Wooldridge et al., 2008). Mid-level *line managers* can be found in different forms, such as general line managers or functional line managers, and play a crucial role in project portfolio management processes. In a traditional matrix environment, these managers are considered resource owners who are responsible for the effective and efficient assignment of departmental employees (Platje et al., 1994). They act in a decentralized manner and are assumed to optimize the objectives of an organizational subsystem, such as their department or function. Moreover, line managers typically lead lower organizational levels and are responsible for consistent and reliable resource commitments and project execution. Finally, line managers are considered to act as brokers and mediators between business strategy and daily business (Shi et al., 2009). Thus, under normative conditions and a process-oriented understanding of PPM, the major phase for line manager engagement is the *resource management phase*.

(3) *Project portfolio managers*. In addition to traditional line managers, project portfolio managers have evolved as a relatively new managerial role. These managers are supposed to be critical in planning and controlling complex project landscapes and implementing project portfolio management practices (Jonas, 2010). The function of project portfolio managers is to coordinate multiple projects across projects within one organization and can be classified under the aforementioned middle management. However, in terms of their specific objectives and depending on their assigned responsibilities, project portfolio managers can either be primarily administrative personnel or be able to shape a company's future through their influence, or their role may fall somewhere in between (Blomquist and Müller, 2006). We define a project portfolio manager as a centralized middle management coordination unit that supports senior managers with its specialized knowledge regarding project portfolio practices (Dillard and Nissen, 2007). Under normative conditions and with respect to the process-oriented understanding of PPM, the major phase for the engagement of project portfolio managers should be the third phase, the *portfolio steering phase*.

(4) *Project managers*. Project managers are the most obvious stakeholders and are doubtless perceived as crucial for project portfolios. Project managers are accountable for their individual project success. Moreover, they represent their team and internal or external project customers in a portfolio (Anantatmula, 2008; Geoghegan and Dulewicz, 2008). Also on the portfolio level, issues such as handling traditional resource conflicts between projects and between line and project managers in matrix organizations remain typical challenges. As opposed to the other three strategic internal stakeholders, project managers have no major phase of engagement in the PPM process. In fact, project managers contribute to all three PPM phases in a different manner. With respect to *portfolio structuring*, these managers are expected to reach the agreed-upon project objectives to realize the planned project value. Regarding *resource management*, project managers must comply with given resource commitments through robust project planning and leading to future competence development. With respect to *portfolio steering*, project managers are responsible for the continuous delivery of timely and reliable project status information to allow for cross-project optimization and mutual collaboration across project borders.

Each of these stakeholders is supposed to comply with his or her specific role with respect to the PPM process. Thus, to explore stakeholder engagement in PPM, one must consider the degree to which stakeholder roles in the management system are ambiguous and the clarity of the distribution of task conduction within such a system. According to Bliese and Castro (2000), "role clarity has been explored in literally hundreds of occupational stress studies" (p. 66). Nonetheless, we use role clarity as a trait of the management system. In contrast with the clarity of a single managerial role, in the current analysis, this clarity refers to the overall clarity across the roles of all internal stakeholders. Stakeholders are assumed to be more effective when they understand what must be accomplished, whereas role ambiguity appears to decrease performance (Hall, 2008; Tubre and Collins, 2000). In the PPM context, unclear roles could lead to unintended meddling in the project portfolio management process or to negative effects through well-intentioned but incorrect interventions. Role clarity aims for both formal differentiated role descriptions and actually practiced behavior, indicating whether each task is performed exclusively by the intended stakeholder. This implies clear definitions of the objectives and authorities within the project portfolio management process. Thus, role clarity can be understood as an indicator of the overall degree of PPM maturity.

3. Hypotheses

We develop our hypotheses and the resulting model based on the insights that are discussed in the extant research. The root idea builds on the concept of general stakeholder theory, which posits that stakeholders are critical for firm success, and we transfer this idea to the realm of project portfolio management. The stakeholder definition in general stakeholder theory (e.g., Freeman et al., 2010) and the derived definition for PPM imply that stakeholders can influence the success of an organization and a project portfolio, respectively. This influence can be related to the (potential) behavior of stakeholders. As a crucial and presumably the most fundamental aspect of stakeholder behavior literature describes the extent to which stakeholders (potentially) engage themselves. Further, this intensity of stakeholders' engagement may vary between firms or portfolios (PMI, 2008a).

Therefore, we propose that the intensity of stakeholders' engagement influences project portfolio success, whereas the

previously mentioned concept implies that a high intensity per se is not necessarily positive but its effect also depends on other aspects such as, for example, supportiveness. For the previously defined internal key stakeholders, this proposal translates into the following hypotheses.

H1a. Senior managers' intensity of engagement influences project portfolio success.

H1b. Line managers' intensity of engagement influences project portfolio success.

H1c. Project portfolio managers' intensity of engagement influences project portfolio success.

H1d. Project managers' intensity of engagement influences project portfolio success.

Although the extant research suggests that the overall intensity of engagement of one stakeholder influences project portfolio success (as stated in hypotheses H1a–H1d), one must consider that project portfolios and their management are dynamic. During an organization's life cycle, the importance of stakeholders varies at different stages because of their varying potential of contribution and behavior (Aaltonen and Kujala, 2010; Altinay and Miles, 2006; Jawahar and McLaughlin, 2001, cited in Assudani and Kloppenborg, 2010). For the project portfolio management process, Levine (2005) indicated that there are "right" phases in which each stakeholder may engage and his or her engagement is connected to a positive influence on the overall project portfolio management process. For example, it may be counterproductive if senior managers invest significant personal time in portfolio steering and accelerate selected projects outside of the official prioritization processes and rules. Therefore, increased stakeholder engagement can unfold its (positive) effect on success only if the higher engagement is also invested in the appropriate process phase. Therefore, we propose that the effect of the intensity of engagement of stakeholders on success may differ for each PPM phase and for each stakeholder. Thus, we argue that a deeper analysis of the influence of stakeholders' effect needs to be phase-specific.

In our role definitions, we normatively derived a major phase for three of the four strategic internal stakeholders. Because high engagement of the respective stakeholders in the corresponding major phases represents the theoretically desired state, we expect that this will exert a positive influence on project portfolio success.

H2a. Senior managers' intensity of engagement in the portfolio structuring phase positively influences project portfolio success.

H2b. Line managers' intensity of engagement in the resource management phase positively influences project portfolio success.

H2c. Project portfolio managers' intensity of engagement in the portfolio steering phase positively influences project portfolio success.

Hypotheses H2a–H2c focus on the extent to which stakeholders engage in the respective phases. Based on the previous discussion of role clarity, we argue that the effect of increased engagement depends on whether stakeholders know what they are expected to do (formal differentiated role descriptions) and whether they actually do it (practiced behavior). Hence, we propose the following hypothesis:

H3. Role clarity moderates the effect of the intensity of engagement of stakeholders on project portfolio success.

The overall research model with all hypotheses is summarized in Fig. 1.

4. Method

4.1. Empirical sample

To test our hypotheses, we use a cross-sectional sample of 197 project portfolios of firms in Germany, Austria, and Switzerland. Corresponding data were collected as part of a more comprehensive survey to investigate different project portfolio management issues. To ensure that the participants had a sufficient understanding of the object of the research; exclusively, suchlike firms were contacted which run project portfolios of at least 20 simultaneous projects. Moreover, the sample focuses on internally sponsored projects, such as IT and R&D projects, which permit a high degree of freedom in managing portfolios and cross-project optimizing.

Firms were contacted through a direct mailing to 1455 managers, explaining the objectives, individual returns, and procedures of the study, to ensure that the sample size was representative. Through follow-up interviews by phone with interested managers it was verified that the potential informants fulfilled all participation requirements. In particular, the adequacy of firms' project portfolio size and representatives' access to the required informants was validated. In each firm, two informants were approached—one senior manager and one project portfolio manager from middle management. Senior management informants had to have decision-making authority over the project portfolios (e.g., with respect to initiating, terminating, or delaying projects). Typically, these informants were chief executive officers, heads of business units, heads of divisions, or heads of R&D. Project portfolio managers on the other hand were those informants who were expected to be operatively involved in project portfolio management processes. These managers held various titles, such as project portfolio coordinator/manager, head of project management office, or department manager. The multiple informant design on two different management levels was chosen to obtain a broader picture of the processes, information flows, and responsibilities of the analyzed firms. Furthermore, the chosen research design eliminates the problem of common method bias (Podsakoff et al., 2003) because the portfolio manager informants assessed the engagement of stakeholders within the project portfolio management processes, which translates into their intensity of engagement. The senior management informants assessed the outcome variable *project portfolio success*.

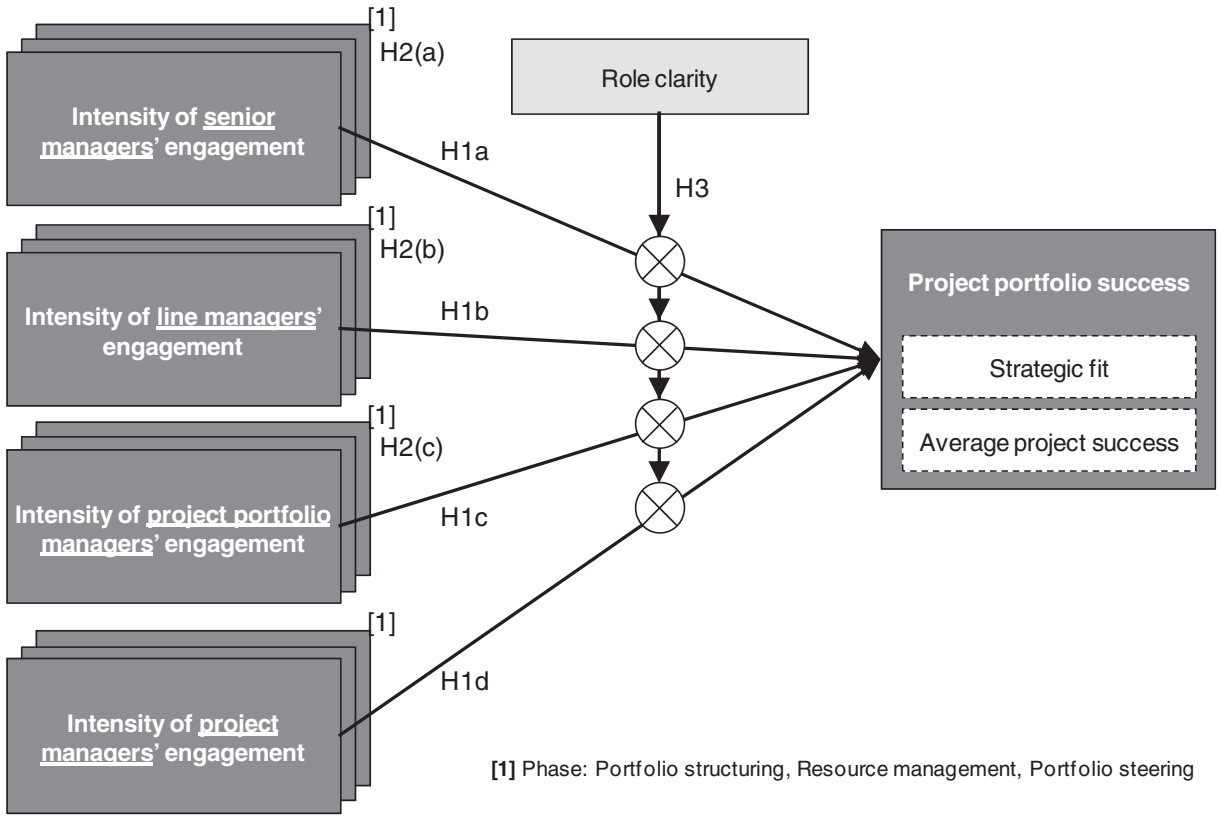

Fig. 1. Model for impact of intensity of engagement on success.

In total, 426 sufficiently completed questionnaires were submitted, which corresponds to a response rate of 29%. The total of 426 surveys comprise 209 questionnaires from senior management informants and 217 questionnaires from portfolio manager informants, yielding 201 matched pairs. For our analyses, we used only the sample of fully matched pairs and excluded surveys with missing values in our focal constructs. This resulted in a valid sample size of 197 matched pairs. The study includes one-third of the 100 largest corporations in Germany, Austria, and Switzerland. Therefore, the sample can be considered a representative cross-section of medium-sized and large firms. Portfolios' size averages with 129 projects and an overall annual budget of €168 million. 34% of the firms have fewer than 500 employees, 27% employ 500 or more but less than 2000 employees, and 39% have more than 2000 employees. Moreover, the sample has a reasonable spread across industries: automotive and machinery (23%), financial services (19%), electronics (12%), IT/telecommunications (11%), other services (17%), pharmaceuticals (6%), and others (12%). After data processing, we conducted a conference to discuss and validate our findings with nearly 100 experts from 62 firms that participated in our study.

4.2. Measurement

4.2.1. Dependent variables

Project portfolio success was measured using two constructs, *average project success* and a portfolio's *strategic fit*, each entailing a three-item scale (Hair et al., 2006). Both constructs were assessed by the senior management informants. All items were derived from conceptual articles in the literature or were directly based on existing scales. Following previous suggestions in the literature, we used discriminated measures for the project perspective and strategic fit (Blomquist and Müller, 2006; Müller et al., 2008). Regarding the (single) project level, we used a scale that addresses the *average* project performance over all projects within the portfolio. This scale for the *average project success* ($\alpha = 0.73$) refers to the triple constraints of delivering projects according to specifications, on time, and within budget (Cooper and Edgett, 2003; Engwall and Jerbrant, 2003; Lechler and Dvir, 2010). Following the argumentation of Meskendahl (2010), we used a *strategic fit* scale ($\alpha = 0.82$) that covers the degree to which a portfolio reflects the overall strategy in terms of the alignment of project objectives and resource allocation (Milosevic and Srivannaboon, 2006; Srivannaboon and Milosevic, 2006). For all scales, reliability was assessed based on the calculated Cronbach's alphas and could be considered satisfactory, since literature discusses cut-off values for alpha coefficients between 0.7 and 0.8 (Hair et al., 2006). To assess validity also a confirmatory factor analysis (CFA) was conducted. Both variables had significant loadings between 0.7 and 0.83, and the overall model fit was acceptable ($\chi^2 = 19.02$; df = 8; $p < 0.02$; SRMR = 0.038; CFI = 0.97). Average project success and strategic fit were correlated but distinct ($r = 0.51$).

4.2.2. Independent variables

Accounting for PPM being a distributed process with the interplay between stakeholders as a crucial factor, we included all relevant stakeholders in our regression analysis and accepted the increased complexity. Thus, we measured the intensity of engagement of each of the four stakeholders in each of the three PPM phases. Additionally, we measured role clarity as an indicator of PPM maturity. To measure *role clarity* within the project portfolios in our study, we developed an appropriate multi-item scale based on insights from the literature review, our workshops, and questionnaire pre-tests. For our role clarity scale ($\alpha = 0.84$), we specified three items that indicated the overall role clarity across all involved internal stakeholders.

Because large-scale empirical research with project portfolios and stakeholders as units of analysis is scarce, we found no well-established scales that we could use to measure stakeholder engagement with respect to our focal questions. Therefore, we developed a two-dimensional 6×9 question matrix consisting of six items for the different stakeholders (board of directors/CEO, divisional head, department head, project leader, multi-project coordinator, and project management office) and nine items for the different managerial activities in the project portfolio management process. Thereby, each of the three phases of the PPM process was represented by three activity items (*portfolio structuring*: 1—strategic portfolio planning, 2—evaluation of projects, and 3—selection of projects; *resource management*: 4—cross-project resource allocation planning, 5—individual allocation of employees to projects, and 6—release of project resources; *portfolio steering*: 7—controlling of the project portfolio, 8—monitoring of the strategic alignment of the portfolio, and 9—cross-functional coordination of projects). We asked the portfolio manager informants to indicate who in their organizations are primarily responsible for the nine chosen activities; multiple responses were allowed. For our analysis, we aggregated the answers along the three PPM phases and four generic stakeholders (board of directors and division heads were subsumed as senior managers; multi-project coordinators and PMO were subsumed as project portfolio managers). We then transformed the counts into uniform scores between 1 and 7 to ensure comparability with the Likert-type scales that were used for the other variables. In sum, this procedure led to twelve constructs that measure the extent or intensity of the engagement of each of the four stakeholders in each of the three PPM phases.

4.2.3. Controls

To reflect portfolios' and firms' environment as well as characteristics, we included five control variables in our analysis. First, we controlled for *market turbulences* during the period of data collection during the 2009 financial and economic crises. The respective construct ($\alpha = 0.82$) comprised three items regarding the actual effect of the crises on required changes within portfolios. Second, the natural logarithm of the firms' overall head count as a proxy for *firm size* was included in our analysis. Firm size may affect project portfolio success because larger firms might have a greater capacity and need to implement project portfolio management. Third, following the same logic on the portfolio level, we included *portfolio size* as the natural logarithm of the overall number of projects in each portfolio. Fourth, we used an *NPD* dummy variable to indicate whether a portfolio consisted of 50% or more research- and NPD-driven projects (1) or not (0). New product development portfolios showed higher uncertainty and risk, which may have affected success. Finally, we included the degree of *portfolio interdependencies*. This control variable was measured as a three-item scale that referred to the content-related interdependencies between projects in the same portfolio ($\alpha = 0.80$). Higher interdependencies could be negatively correlated with success as a result of more complex processes (Cusumano and Nobeoka, 1998). Whereas market turbulence was assessed by the senior management informants, portfolio manager informants assessed the remaining control variables.

5. Results

To test our hypotheses with respect to the two different success measures, we used hierarchical ordinary least squares (OLS) regression. To better understand the interactions between the intensity of engagement and role clarity, we graphically illustrate how role clarity influences the effects of intensity of engagement using simple slopes.

5.1. Strategic fit dimension of project portfolio success

Table 1 shows the results of the moderated hierarchical OLS regression with strategic fit as the dependent variable. In the first step (model A), we include only control variables in the regression model, which shows small significant negative effects for market turbulence (-0.09, $p < 0.05$) and firm size (-0.08, $p < 0.05$). In the second step (model B), we test for direct effects of our aggregated independent variables and the hypothesized moderator variable. Line managers show a significant direct positive effect on strategic fit (0.10, $p < 0.05$), which supports H1b. However, we must reject hypotheses H1a, H1c, and H1d on this aggregation level. In the third step (model C) of breaking down all independent variables to the phase level, direct effects are even reduced, as our control variable for market turbulence no longer has a significant influence on strategic fit. In the fourth and final step (model D), again on the phase level, we eventually include two-way interactions. To ensure interpretable coefficients, we mean-center independent and moderator variables before joining them into the interaction (Aiken and West, 1991). The overall model D is significant ($R^2 = 0.25$, $F = 2.15$, $p < 0.01$) and will be the core of the following analysis.

The unstandardized regression coefficients show several significant direct and interaction effects, whereas no control variable has significant influence. For the intensity of senior managers' engagement in the structuring phase surprisingly there is no effect, on the one hand. On the other hand, there can be observed a positive effect of the interaction between the intensity of senior managers' engagement and role clarity in the resource management phase (0.11, $p < 0.05$) and a negative

Table 1
Intensities of engagement influencing strategic fit.

	Strategic fit as dependant variable [a]							
Variables	Model A		Model B		Model C		Model D	
Market turbulence	−0.09 *	(0.04)	−0.08 *	(0.04)	−0.08	(0.04)	−0.07	(0.04)
Firm size [b]	−0.08 *	(0.03)	−0.08 *	(0.03)	−0.08 *	(0.04)	−0.06	(0.04)
Portfolio size [b]	0.00	(0.06)	0.01	(0.06)	0.02	(0.06)	0.01	(0.06)
R&D intensity	0.05	(0.14)	0.06	(0.16)	0.08	(0.15)	0.09	(0.15)
Portfolio interdependencies	0.03	(0.06)	0.03	(0.06)	0.02	(0.06)	0.00	(0.06)
Overall PPM process								
Senior managers			0.01	(0.06)				
Line managers			0.10	(0.05) *				
Project portfolio managers			0.07	(0.06)				
Project managers			0.03	(0.07)				
Portfolio structuring								
Senior managers					−0.02	(0.06)	−0.02	(0.06)
Line managers					0.03	(0.04)	0.02	(0.04)
Project portfolio managers					−0.03	(0.08)	−0.09	(0.08)
Project managers					0.03	(0.07)	0.00	(0.07)
Resource management								
Senior managers					0.04	(0.06)	−0.03	(0.06)
Line managers					−0.01	(0.04)	−0.04	(0.04)
Project portfolio managers					0.05	(0.08)	0.05	(0.08)
Project managers					0.00	(0.04)	0.04	(0.04)
Portfolio steering								
Senior managers					0.00	(0.06)	0.05	(0.06)
Line managers					0.09	(0.05)	0.13 *	(0.05)
Project portfolio managers					0.06	(0.06)	0.10	(0.07)
Project managers					−0.02	(0.06)	0.00	(0.06)
Role clarity			0.09	(0.05)	0.09	(0.05)	0.09	(0.06)
Portfolio structuring								
Senior managers × role clarity							0.03	(0.04)
Line managers × role clarity							0.05	(0.04)
Project portfolio managers × role clarity							0.16 **	(0.06)
Project managers × role clarity							0.05	(0.06)
Resource management								
Senior managers × role clarity							0.11 *	(0.05)
Line managers × role clarity							0.06 *	(0.03)
Project portfolio managers × role clarity							−0.04	(0.06)
Project managers × role clarity							−0.05	(0.03)
Portfolio steering								
Senior managers × role clarity							−0.14 **	(0.05)
Line managers × role clarity							−0.08	(0.05)
Project portfolio managers × role clarity							−0.03	(0.05)
Project managers × role clarity							0.06	(0.05)
Constant	5.86 ***	(0.42)	4.80 ***	(0.57)	4.82 ***	(0.59)	4.79 ***	(0.57)
F	2.40 *		2.19 *		1.18		2.15 **	
R^2	0.06		0.10		0.13		0.25	
Adjusted R^2	0.03		0.05		0.05		0.11	
Δ R^2			0.04		0.07		0.12 *	

[a] Unstandardized coefficients are given, with standard errors in parentheses.
[b] Natural logarithm. n = 197.
* p < .05.
** p < .01.
*** p < .001.

interaction effect in the portfolio steering phase (−0.14, p < 0.01). Hence, although hypotheses H1a in general and H2a must be rejected, our results support H1a if limited to resource management and portfolio structuring within the PPM process. For resource management, Fig. 2 reveals that only at high role clarity there is a positive effect, and at low role clarity

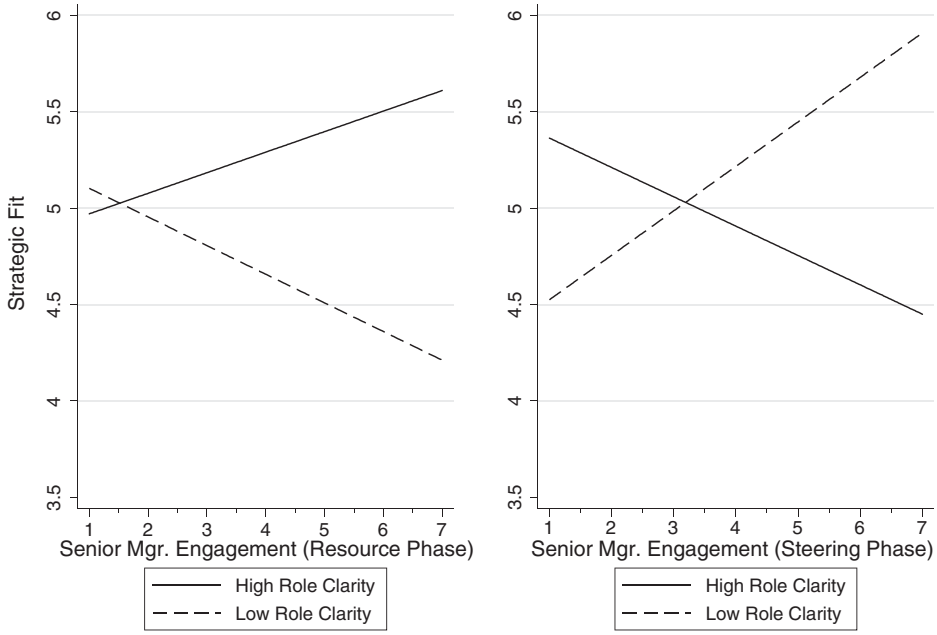

Fig. 2. Simple slopes—interaction effects of senior managers.

the effect becomes negative. In the portfolio steering phase, there is a positive effect for low role clarity and a negative effect for high role clarity (also see Fig. 2).

For line managers, the interaction between the intensity of their engagement and role clarity shows a small significant positive effect for the resource management phase (0.06, $p<0.05$), and this result supports hypothesis H2b. The simple slope in Fig. 3 reveals a negative effect for low role clarity and a positive effect for high role clarity. Furthermore, the intensity of engagement of line managers in the portfolio steering phase shows a direct positive effect on strategic fit (0.13, $p<0.05$), whereas the corresponding interaction effect is negative but not significant. Fig. 3 shows that for low role clarity, the engagement of line managers positively affects strategic fit, whereas for high role clarity, the effect is significantly weaker but still marginally positive.

The intensity of engagement of project portfolio managers in the structuring phase of PPM positively affects the strategic fit

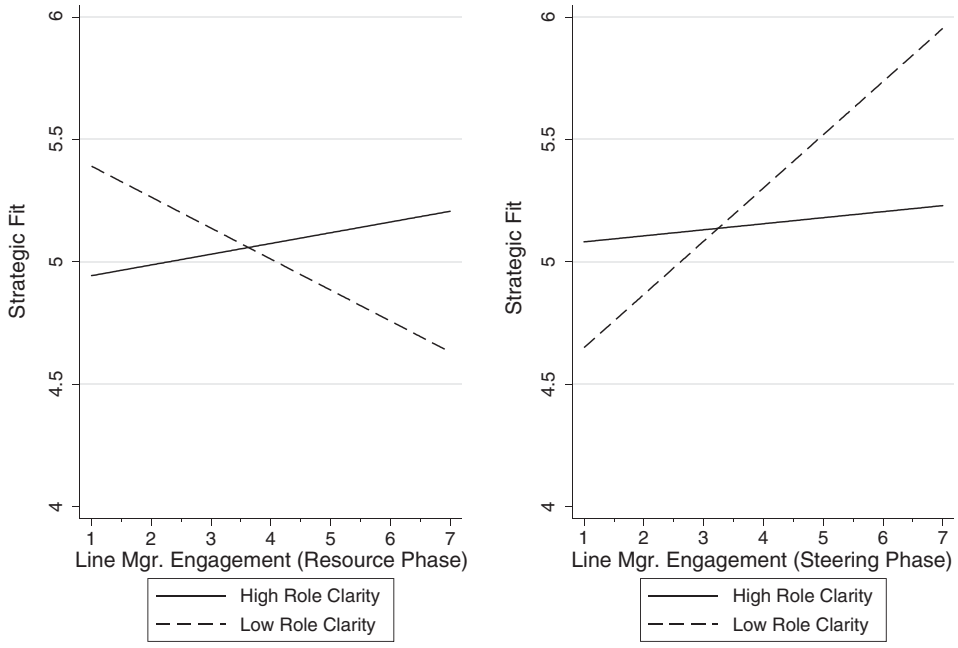

Fig. 3. Simple slopes—interaction effects of line managers.

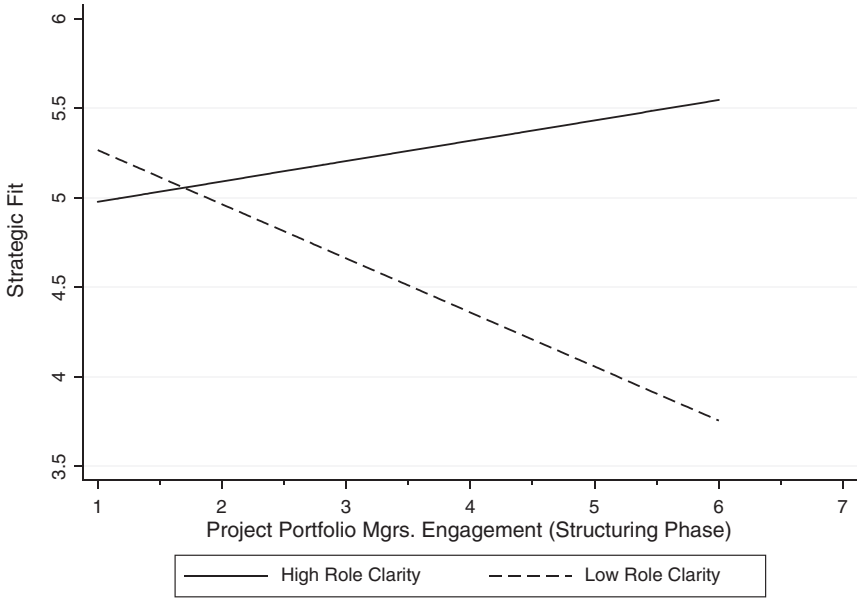

Fig. 4. Simple slopes—interaction effect of portfolio managers.

of a portfolio (0.16, $p<0.01$). Fig. 4 shows that the effect on strategic fit is positive only at high levels of role clarity and that the effect is strongly negative at low levels of role clarity.

Surprisingly, we must reject hypothesis H2c, as the regression does not show any significant effect for the intensity of engagement of project portfolio managers in the steering phase. As proposed, our results support the notion that the intensity of engagement of each stakeholder has a different effect on strategic fit (i.e., positive, negative to a different extent, or no significant effect) for each PPM phase. The regression also includes non-significant coefficients and requires us to reject the general hypotheses H1a–H1d (in model D).

Although we must reject hypothesis H3 on a general level because some of the moderated effects are not significant, the previously described results partially support hypothesis H3 for specific stakeholder-phase combinations.

5.2. Average project success dimension of project portfolio success

The results of the regression with average project success as the dependent variable are presented in Table 2. Models A, B, C, and D are built according to the same logic as in the previous regression. Model A—which includes only the control variables—shows a small significant negative effect for firm size (-0.09, $p<0.05$) and a very strong negative effect for R&D intensity (-0.49, $p<0.05$). In model B, which tests for the direct effects of the aggregated independent variables and moderator variable, the intensity of engagement of project managers shows a strong significant direct positive effect on average project success (0.22, $p>0.05$); this finding supports H1d. In model C, among the control variables, only R&D intensity affects average project success (-0.36, $p<0.05$). Further, the intensity of engagement of line managers in the resource management phase significantly affects average project success. Surprisingly, this effect is negative (-0.11, $p<0.05$), and we must therefore reject hypothesis H2b regarding average project success. Even more, because there are no further effects for the intensity of engagement, we must also reject hypotheses H1a, H1b, H1c, and H1d for project managers as well as H2a and H2c. Finally, our moderator variable role clarity shows a significant positive direct effect on average project success (0.13, $p<0.05$). Model D provides no additional explanatory value compared with model C, as the delta-R^2 value is not significant. Thus, H3 must be rejected, and we use only the significant models B ($R^2=0.15$, $F=3.24$, $p<0.001$) and C ($R^2=0.19$, $F=2.37$, $p<0.01$) to interpret the results.

6. Discussion

The objective of this study is to investigate the effect of the engagement of strategic internal stakeholders in the different PPM phases on project portfolio success considering varying degrees of PPM maturity. The imperative for this detailed analysis is underlined by examining average engagement over all phases with average levels of role clarity. We found that only two stakeholders significantly influence project portfolio success. The positive influence of line managers on strategic fit demonstrates their function as an interface between strategy and operations (Shi et al., 2009). Moreover, line managers also provide the resources for projects in portfolios, provide functional knowledge as domain experts, must subsequently implement the results of such projects, and possess the political power to support or oppose projects. Hence, the engagement of line managers on average supports the PPM process, and the absence of their engagement can constitute a significant obstacle. The positive influence of project managers on average project success is rather obvious, as they are responsible for running the projects in portfolios and represent their projects in the PPM process. Consequently, an increased engagement in the PPM process (e.g., to obtain qualified

Table 2
Intensities of engagement influencing average project success.

	Average project success as dependent variable [a]							
Variables	Model A		Model B		Model C		Model D	
Market turbulence	−0.03	(0.05)	−0.03	(0.05)	−0.03	(0.05)	−0.03	(0.05)
Firm size [b]	−0.09 *	(0.04)	−0.08 *	(0.04)	−0.07	(0.04)	−0.05	(0.04)
Portfolio size [b]	0.13	(0.07)	0.12	(0.07)	0.12	(0.07)	0.10	(0.07)
R&D intensity	−0.49 *	(0.16)	−0.36 *	(0.17)	−0.36 *	(0.17)	−0.31	(0.17)
Portfolio interdependencies	−0.04	(0.07)	−0.03	(0.06)	−0.01	(0.07)	−0.03	(0.07)
Overall PPM process								
Senior managers			−0.10	(0.07)				
Line managers			−0.10	(0.05)				
Project portfolio managers			0.01	(0.07)				
Project managers			0.22 *	(0.07)				
Portfolio structuring								
Senior managers					−0.09	(0.06)	−0.08	(0.06)
Line managers					0.03	(0.05)	0.01	(0.05)
Project portfolio managers					0.02	(0.09)	−0.03	(0.09)
Project managers					0.12	(0.08)	0.08	(0.08)
Resource management								
Senior managers					−0.08	(0.06)	−0.11	(0.07)
Line managers					−0.11 *	(0.04)	−0.13 **	(0.04)
Project portfolio managers					0.01	(0.09)	−0.02	(0.09)
Project managers					0.04	(0.05)	0.09	(0.05)
Portfolio steering								
Senior managers					0.08	(0.06)	0.08	(0.07)
Line managers					−0.04	(0.06)	0.01	(0.06)
Project portfolio managers					0.03	(0.07)	0.06	(0.08)
Project managers					0.10	(0.07)	0.10	(0.07)
Role clarity			0.11	(0.06)	0.13 *	(0.06)	0.15 *	(0.06)
Portfolio structuring								
Senior managers × role clarity							−0.03	(0.05)
Line managers × role clarity							0.02	(0.04)
Project portfolio managers × role clarity							0.11	(0.07)
Project managers × role clarity							0.04	(0.07)
Resource management								
Senior managers × role clarity							0.03	(0.05)
Line managers × role clarity							0.06	(0.03)
Project portfolio managers × role clarity							0.10	(0.07)
Project managers × role clarity							−0.06	(0.04)
Portfolio steering								
Senior managers × role clarity							−0.04	(0.06)
Line managers × role clarity							−0.03	(0.05)
Project portfolio managers × role clarity							−0.01	(0.06)
Project managers × role clarity							0.10	(0.06)
Constant	5.32 ***	(0.47)	4.81 ***	(0.64)	4.67 ***	(0.65)	4.59 ***	(0.65)
F	3.33 **		3.24 ***		2.37 **		2.09 **	
R^2	0.08		0.15		0.19		0.27	
Adjusted R^2	0.06		0.10		0.11		0.14	
ΔR^2			0.07 *		0.11 *		0.08	

[a] Unstandardized coefficients are given, with standard errors in parentheses.
[b] Natural logarithm. n = 197.
* p < .05.
** p < .01.
*** p < .001.

resources for their projects or to become aligned with other project managers) positively affects the success of their projects. More differentiated findings will be discussed below.

(1) *Senior managers*. A wide range of studies has shown a positive effect of the engagement of senior managers on project success (e.g., Gomes et al., 2001; Swink et al.,

2006). In view of these findings, it is initially surprising that the engagement of senior managers has no significant influence in their germane phase of portfolio structuring, especially in terms of strategic fit. According to the work of Bonner et al. (2002) or Unger et al. (2012) on project termination within PPM, senior managers' effect may be of an inverted U-shaped nature (see also Onyemah, 2008). This shape could be explained by the tendency of senior managers to mentor their "pet projects" (i.e., projects that are personally important to senior managers). Such mentoring may result in allocating more resources than are justifiable based on strategy or may result in continuing to pursue failing projects (Biyalogorsky et al., 2006; Schmidt and Calantone, 2002). The so-called "escalation of commitment" (Brockner, 1992; Staw, 1981) has not only been discussed as a factor that negatively affects success in general management and new product development but also has been demonstrated as a success factor for projects and project termination in the PPM process (Unger et al., 2012). In particular, the termination of projects is strongly connected to the recurring selection of projects in the portfolio structuring phase.

Our rationale is further supported in the resource management phase at low levels of role clarity when line managers are not fully clear with regard to their responsibilities or do not actually fulfill their responsibilities. Then, senior managers can easily overrule line managers and use the opportunity to promote their "pet projects" by privileging them in staffing. Senior managers in PPM may overcome barriers of will through their hierarchical potential, similar to the role of power promotors in the innovation management literature (Gemünden, 1985; Gemünden et al., 2007; Hauschildt and Kirchmann, 2001). With increasing role clarity, the power of senior managers is channeled, and negative effects are mitigated.

As observed in the portfolio steering phase, this issue can worsen. When all stakeholders know and fulfill their responsibilities, senior managers' meddling and micromanagement in portfolio steering negatively affect PPM success (Bonner et al., 2002). The rationale for this observation becomes clear when we consider that the engagement of senior managers in portfolio steering is not part of their formally defined key responsibilities (except final decisions on project termination) but actually conflicts with the role of project portfolio managers. Further, portfolio steering is an operative rather than strategic task; therefore, it is not assumed to be a core competence of senior managers, especially compared with project portfolio managers. Only in immature PPM systems with low role clarity can the interventions of senior managers be understood as supportively compensating for the lack of role clarity among the more operative stakeholders, particularly project portfolio managers, and not properly defined roles regarding PPM needs.

(2) *Line managers*. Generally, line managers attempt to optimize their sub-portfolio of projects that is predominantly relevant for their own department and its sub-strategy (Platje et al., 1994). Additionally, as resource owners, they hold the greatest knowledge of resources. Given a situation lacking role clarity, immature PPM systems provide line managers with opportunities to pursue their personal interests and act like manorial lords rather than servants of the overall PPM process who contribute to the overall strategic fit. Higher role clarity regulates opportunities for control and forces line managers to pursue their formally defined interests in the portfolio context. Therefore, increasing role clarity causes this negative influence to disappear. The direct negative effect on average project success reflects the classical conflict between line organization and projects (Payne, 1995).

With respect to portfolio steering, line managers play a crucial role as long as the PPM system is in a build-up state with low to average maturity. The positive influence on strategic fit may stem from the line managers' superior knowledge of their business and familiarity with the specifics of the environment in which projects run. Line managers know where problems can occur, know where attention and steering is needed most, and can identify conflicts first—particularly within their own departments—given their experience, expertise, and function as resource owners. In contrast, project portfolio managers with limited empowerment and expertise (in immature PPM systems) may not know the specifics of projects and may thus be able to steer on an overarching level that may be rather general and potentially insufficient. Further, line managers can act as an interface between senior management strategy and operative project scope during this build-up (Shi et al., 2009).

(3) *Project portfolio managers*. Surprisingly, the results do not show a significant positive effect of the intensity of engagement of project portfolio managers on strategic fit or average project success. There may be two explanations, as PPM is still new in many firms and is not yet a fully established management system. First, even with increasing role clarity, some project portfolio managers may still have problems with their new role because they lack the required qualifications, knowledge, and experience. Second, in the firms in our sample, roles may have not yet been defined in a manner that renders them significantly beneficial to the PPM process.

The core responsibilities of project portfolio managers in the PPM process are more operational in nature, and they should not serve as visionaries focusing on strategy. However, they must not be pure administrators who solely focus on data and operations. Rather, project portfolio managers need both a strategic orientation (i.e., understanding and buying in to portfolio strategy) and operational transparency (i.e., collecting and analyzing relevant information) to be able to steer project portfolios successfully. Generating transparency and steering

portfolios are rather operational tasks, where respective competences can be developed. A strategic orientation can be viewed rather as a necessary requirement to enable project portfolio managers to steer a portfolio successfully. Hence, our results show that involving project portfolio managers in portfolio structuring can be beneficial to generate the necessary strategic understanding and buy-in and thus enable them to successfully perform their major task of portfolio steering. Further, these managers can also provide relevant information for portfolio structuring (Raes et al., 2011). However, we also observe that this approach applies only in situations of very high role clarity. On the contrary, in immature PPM systems in which project portfolio managers may not know or completely fulfill their formal PPM responsibilities, their engagement in portfolio structuring negatively affects strategic fit. This can be further explained by their more operational and less strategic mindset as well as their lack of overall business knowledge.

In summary, this study contributes to both PPM and stakeholder literature. For PPM, this study shows the differential effect of stakeholder engagement on portfolio success. Stakeholder theory is enhanced by integrating different contributions within stakeholder theory, testing the theory with empirical data, and applying the theory to the context of PPM. For example, in our study, one model integrates the notion of different degrees of activity as reflected in Mitchell et al.'s (1997) degrees of salience and described by Rowley and Moldoveanu (2003), with the network view of Rowley (1997) and the work of Neville and Menguc (2006), who emphasized interactions between stakeholders. Our work strengthens the relatively weak basis of empirical work on stakeholder behavior and stakeholders' effect on success. Thereby, our research enhances the contributions, that have been offered with respect to the influence of specific stakeholders on success, particularly senior management involvement (e.g., Unger et al., 2012), to a larger group of key stakeholders. Overall, our work addresses the fact and weakness of stakeholder theory: many theorizing efforts have been made, but only a few empirical studies have been presented to date (Freeman and McVea, 2001). This study shows that stakeholder engagement affects performance only in environments with sufficiently defined roles and responsibilities. In firms with low PPM maturity and unclear roles, stakeholder engagement may be misguided.

6.1. Managerial implications

From our results, we derive guidance for senior, line, and project portfolio managers.

Senior managers should adapt the intensity of their engagement to the requirements in each phase of PPM. This means specifically to focus on senior managers' major phase (i.e., portfolio structuring by definition) and also to accompany the further process ensuring that objectively most important projects are assigned the key resources. However, while focusing on portfolio structuring and aiming for PPM success, senior managers should ensure that "pet projects" do not persist through, for example, process definitions, objective criteria and increasing transparency. Moreover, with increasing operational tasks and decreasing strategic content from portfolio structuring to steering, senior managers should reduce their engagement and delegate to line and project portfolio managers. Thus, senior managers avoid over-steering and micro-management by choosing an appropriate management style, which is crucial for successful PPM (Fricke and Shenhar, 2000). In parallel, senior managers must further build up, strengthen, and enforce the PPM system; specifically, they must enable and empower project portfolio managers. It is not only senior managers' responsibility to ensure the basic conditions for a functioning PPM process besides their tasks within the process, but due to their institutional power they also have the ability and authority to enact PPM rules and processes and to enforce their effective application (Chakrabarti, 1974). This means specifically to make transparent and clear formal role descriptions to all stakeholders and ensure that all stakeholders fulfill their responsibilities and obey defined rules and processes. Otherwise, for example, senior managers may drown in firefighting in portfolio steering and therefore lack time to invest in effective portfolio structuring and resource allocation. Additionally, line managers may take advantage of their broker role and follow their tendency to optimize their sub-portfolios at the cost of reduced portfolio success.

Line managers can also provide support in phases other than their major phase, particularly during the build-up of PPM systems. During the transition, when responsibilities are being transferred to project portfolio managers but role clarity remains relatively low, line managers can bridge a potential power and competence vacuum in portfolio steering and thus contribute to PPM success. However, in turn, it is crucial for these managers to significantly reduce their engagement in portfolio steering when PPM is further established. For their major phase (i.e., resource management), line managers should demand and support an increase in role clarity, including obeying defined processes and refraining from pursuing their departmental interests but rather balancing them with overarching PPM goals. Additionally, the latter must be enforced through the increased monitoring of line manager decisions through, for example, mutual control among line managers, frequent steering committees with senior managers, and challenging decisions by senior managers.

Project portfolio managers must actively demand that required competences for their relatively new role are built up and that they receive training, for example. Further, by building on their hub position and connected observation potential, project portfolio managers should continuously ensure transparency for senior managers with respect to discrepancies between current and targeted PPM processes and identify potential levers for improvement. Thus, deficits in PPM maturity become more transparent to senior managers, and project portfolio managers can assist in establish their role and the overall PPM system, contributing to project portfolio success.

In summary, our findings suggest that the average level of PPM maturity that was observed is insufficient with respect to project portfolio success. In particular, senior managers must

increase their efforts to further improve role clarity and professionalize PPM.

6.2. Limitations and future research

As in every empirical study, this study has certain limitations that must be considered when interpreting the results. Although we use a sample of firms from diverse industries and the sample size is satisfactory, the specific characteristics of the participating firms might not represent all firms. In particular, the sample consists only of medium to large firms. Thus, the results may not be directly applicable to small firms, in which stakeholder communication may be easier, more direct, and less complex.

Furthermore, we gathered our data in German-speaking countries (Germany, Austria, and Switzerland) among firms that already apply project portfolio management. Hence, the ability to generalize the results is limited to larger and more project-oriented firms in these countries.

By concentrating on the project portfolio management process and stakeholder interactions, we first focused on the intensity of their engagement. Further research could extend this effort by analyzing the quality of stakeholder engagement, for example, in the sense of supportiveness (McElroy and Mills, 2007) with respect to the goals of PPM phases or the PPM process as a whole.

Second, we did not explicitly consider the competencies held by the managers involved. Although it can be assumed that with increasing project portfolio management role clarity, the competence of the involved managers increases as well, the current study did not explicitly test for these effects in the present study. Such an analysis represents a potential area of future research.

Third, we focused on internal key stakeholders who are directly involved in the PPM process. Future research could place more emphasis on project managers as the interface to the projects in a portfolio or even extend the analyzed stakeholder network by including portfolio-external stakeholders, such as experts within a firm, or firm external stakeholders, such as suppliers and customers.

Appendix A. Appendix to article

Items for role clarity (RC)

(Explanation in questionnaire: Actors in PPM can be: line managers (e.g., department head), senior managers (CEO, Board of directors), multi-project coordinator, project manager, etc.)

RC 1: The tasks of PPM actors are clearly defined and differentiated.
RC 2: Every task within PPM is performed only by the persons being explicitly responsible for this task.
RC 3: PPM tasks are performed redundantly by several parties. (inverted item)

Items for average project success (APS)

APS 1: On average, our projects have high schedule adherence.
APS 2: On average, our projects have high budget adherence.
APS 3: On average, our projects have high quality adherence.

Items for strategic fit (SF)

SF 1: Our project portfolio is consistently oriented toward the firm's future.
SF 2: The corporate strategy is implemented in the optimal way.
SF 3: The allocation of resources to projects reflects our strategic objectives.

Items for controls (MT—market turbulence, PI—portfolio interdependencies)

MT 1: The economic crisis makes a reorientation of our project portfolio necessary.
MT 2: Due to the economic crisis we must reduce our expenditures for projects substantially.
MT 3: The economic crisis does not have an impact on our project portfolio. (inverted item)
PI 1: A high degree of alignment between our projects is required with respect to the scopes.
PI 2: Scope changes of individual projects inevitably impact on the execution of other projects.
PI 3: Often projects can only be continued if the concrete results of other projects are known.

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