

Enforcing strategic fit of project portfolios by project termination: An empirical study on senior management involvement

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Abstract

Project portfolios are vehicles for strategy implementation. Senior management should terminate projects no longer conforming to corporate strategy in order to ensure strategic fit. This paper investigates how rigorous termination of bad and troubled projects affects portfolio effectiveness and senior management's decisive role in this context. We introduce the concept of project termination quality, analyse its consequences for strategic fit and how it is affected by senior management involvement. Using a quantitative longitudinal study of a sample of project portfolios, we show that termination quality positively affects strategic fit. We also show a positive, but inverted u-shaped relationship between senior management involvement and termination quality. We conclude that there is an optimal degree of involvement, beyond which an additional involvement of senior managers results in negative effects.

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1. Introduction

Making decisions to pursue the appropriate projects is the key task in project portfolio management (PPM) in order to sustain competitive advantage and thus prolong business success (Cooper et al., 2000; Dye and Pennypacker, 1999; Roussel et al., 1991). Handling a project portfolio is generally challenging, because it is about deciding upon and thus mastering the competition for the firm's limited resources between all individual projects (Chao and Kavadias, 2008; Dye and Pennypacker, 1999). Additionally the firm's conflict of interest between innovation and efficiency may manifest itself in the portfolio (Green et al., 2003), a characteristic typical for a collection of new product development projects, making these portfolios notoriously difficult to structure.

Ensuring strategic fit is one of senior management's core mandates in PPM. Senior managers here are understood as financially responsible for project portfolios. This puts them in charge of making ultimate go/kill decisions at the gates of the portfolio review process to select the fitting projects and to stop inappropriate ones. In practice first-tier senior managers of an organisation or a business unit take up this role and are also recognised as sponsors (Project Management Institute (PMI), 2008). *Senior management involvement* (SMI) is therefore the extent to which the role senior management is actually fulfilled by the people involved. The literature acknowledges the importance of senior management involvement in steering single projects (Balachandra, 1984; Chakrabarti, 1974; Johne and Snelson, 1988b; Zwikael, 2008) and project portfolios (Cooper and Kleinschmidt, 1995; Johne and Snelson, 1988a) towards success. If in a project portfolio a given project is characterised only by low congruence to corporate strategy, senior management should withdraw resources. Thereby they steer the resource competition to the disadvantage of this particular project, but in favour of the strategic fit of the aggregate portfolio (de Brentani et al., 2010; Pinto and Mantel, 1990; Swink,

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2000). Withdrawing resources from unfitting projects effectively is project termination and of fundamental interest to firms for two reasons: First, collective resources are not worn down in vain. Second, strategy is implemented and executed consciously as only those projects remain in the project portfolio that are in line with corporate strategy.

At the same time project termination has been identified as major managerial challenge for example by Cooper (2008), who highlights that for new product development portfolios weak and late decisions are shortcomings detected in 77% of the firms that claim to have a structured idea-to-launch process. There are several reasons that prevent project abortion to happen including reluctance to terminate on the side of managers (Schmidt and Calantone, 1998), missing prerequisites for termination (Kumar et al., 1996) as well as the difficulty of timing (Tadisina, 1986). Consequently too many bad and troubled projects linger on and decrease overall project portfolio effectiveness.

Numerous studies acknowledge senior management's role in the course of terminating a project to be problematic (Cooper et al., 2000; Gomes et al., 2001; Pinto and Covin, 1989). Cause is primarily senior management's overestimation of own capabilities and over-optimism to allocate resources appropriately (Lovallo and Kahneman, 2003; Staw, 1981). Cooper (2008) presents comprehensive evidence on that matter: senior managers foster their "pet projects", miss important resource meetings, take single-person decisions by "executive edict" and only apply personal instead of transparent prioritisation criteria. There is indication that SMI may have dysfunctional effects (Balachandra, 1984) and thus might limit success (Young and Jordan, 2008). Dilts and Pence (2006) could not conclusively answer if senior management's role impacts on project termination decisions, and reiterated the need to address this question in future studies. Cooper (2008) confirms this demand also from a practitioner's perspective and calls for a definition of governance roles and responsibilities to establish effective "gatekeepers". Furthermore the inquiry into how management actually decides to terminate a new product development project remains unresolved (Green et al., 2003; Montoya-Weiss and Calantone, 1994). Moreover, project termination has been identified in past studies as vital activity to structure a project portfolio strategically (Blau et al., 2004; Seider, 2006), whereas the quality of the project termination process in the execution of project portfolio management is an open issue. Thus our first research question is: What is *project termination quality* (PTQ) and how is it relevant to achieve strategic fit, the necessary project portfolio success dimension? Despite previous research that showed SMI's significant role in executing resource allocation in project portfolio management, senior management's type of activity and degree of involvement are still controversial topics. Specifically, the matter of effective SMI in terms of project termination remains open. The second research question of this paper therefore is: What is the adequate degree of senior management involvement in project termination?

In this paper we investigate the central role of senior management involvement for project portfolio success (Calantone et al., 2003; Kleinschmidt et al., 2007; Markham and Griffin, 1998), because they are most relevant for decision-making on

portfolios and thus for project termination. In doing so, we make several contributions by clarifying the contradictory findings on SMI (Balachandra, 1996; Brockhoff, 1994; de Brentani et al., 2010; Gomes et al., 2001). First, we adopt a multi-project perspective (Söderlund, 2004) and consider direct and indirect effects of SMI in this project portfolio context. This is especially meaningful when judging the appropriate extent of SMI with regard to a global optimum across a bundle of projects. Second, in contrast to Cooper and Kleinschmidt (1995), who suggested intimate involvement, we propose that the adequate degree of involvement is optimal for fit, meaning that more SMI is not always beneficial. Third, we show PTQ is important for strategic fit, thus promote a lever to achieve systematic and consequently effective project termination (Kumar et al., 1996). Fourth, this paper contributes to the literature by showing that the influence of SMI on success is partially mediated by PTQ, giving more insights into the actual mechanisms in contrast to studies that only investigate the direct effect (Henard and Szymanski, 2001). In our methodology we use multiple informants and measure at two different points in time in order to differentiate cause and effect. This avoids ex-post rationalisation or attribution, which has been acknowledged as concern in studies on SMI (Bonner et al., 2002).

2. Management and context of project portfolios

Project portfolios are defined as collections of concurring and competing single projects, where managerial involvement of senior management occurs mainly via resource allocation as a result of senior management's strategic decisions (Archer and Ghasemzadeh, 1999). Project portfolios are acknowledged as most relevant for a firm's success (Roussel et al., 1991). This is manifested by the fact that the sum of all projects in a portfolio embodies an organisation's investment strategy (Dye and Pennypacker, 1999). In order to yield success, these investments need to be continuously optimised to implement strategy effectively (Herfert and Arbige, 2008; Seider, 2006). We hence focus on the project portfolio as object of analysis which is more critical for a firm's success than single projects. Accordingly, project portfolio management is the vehicle to implement strategy in that investments are only provided to fitting projects (Cooper and Edgett, 2003; Cooper et al., 1998; Noda and Bower, 1996) in order to enforce the link of these projects to the business purpose whilst aligning the portfolio to corporate strategy (Arto and Dietrich, 2004; Morris and Jamieson, 2005). Strategic alignment thus is a success criterion for project portfolios. This rationale is typical for strategic management (Venkatraman and Camillus, 1984), but different to single project goals (Lycett et al., 2004).

Challenges of project portfolios arise from their context and the nature of related management requirements (Papadakis et al., 1998). The dynamics of competitive opportunities that open up unpredictably and demand for responses to these changes put project portfolios in an especially demanding set-up (Turner and Müller, 2003). One fundamental objective of project portfolio management is therefore responsiveness to alterations (Dietrich and Lehtonen, 2005; Turner and Müller, 2003). Typical

and iterative managerial activities are recognised as dynamic decision process, which ultimately translate into a constant management challenge to senior management. The management itself to induce strategic alignment of a project portfolio is also posing traps. The activity of project termination is thereby critical as certain types of projects, such as research and development projects due to their high level of newness and thus notoriously incomplete information-base, seem harder to evaluate (Balachandra, 1984; Schmidt and Calantone, 1998). Even more problematic is the Janus-faced demand of management involvement arising with project termination (Staw and Ross, 1987): A strict termination of unfitting projects is required by senior managers who prior to the termination incident were supposed to positively encourage the same projects that then gradually happened to cease in strategic relevance for the firm. The prospect of such a development confronts senior management with difficult and complex financial and motivational conditions that lead to missed or late termination decisions on inappropriate projects (Boulding et al., 1997). These situations are referred to by a number of terms such as entrapment, or “too-much-invested-to-quit syndrome”, sunk cost effect, or escalation of commitment (Schmidt and Calantone, 2002; Staw, 1981). All terms have in common that they describe a situation where – against better knowledge – no final termination of the specific single project takes place.

Both issues can be attributed to senior management. Not only are senior managers accountable for allocating resources according to strategic fit, but their escalating behaviour also often causes dysfunctionalities that lead to late or shunned project termination. Besides, usually no one else is empowered by them to take up this responsibility (Barton et al., 1989; Staw and Ross, 1987). Therefore senior management should insert strategy in project portfolios not only by initiating the right projects but also by strict project termination. This leads us to include SMI in this study as independent variable to explain PTQ and strategic fit.

In the following we offer a detailed explanation of the constructs and their proposed relationships.

3. Conceptual framework and hypotheses

The conceptual framework depicted in Fig. 1 outlines strategic fit that is affected by PTQ, which in turn is influenced by SMI. We propose three hypotheses to be tested in this model.

3.1. Strategic fit

This study focuses on *strategic fit* as the prime objective of project portfolio management. Strategic fit is accomplished

when individual projects, and thus the portfolio, are aligned to a company’s business strategy. Although, there are other types of portfolio objectives such as increasing the overall value and balancing the project portfolio, we consider strategic fit as the most relevant variable in this context for several reasons. First, achieving strategic fit is especially complex in PPM where bundling of single projects to portfolios deludes transparency in terms of relative strategic importance of the individual projects. This is instigated by ceasing effectiveness of (single) project management routines due to the sheer quantity of projects to be managed in such a set-up (Fricke and Shenhar, 2000). Second, establishing strategic fit is senior management’s core activity (Cooper and Edgett, 2003). Third, strategic fit is considered to be of vital importance for the prosperity of the firm for implementing strategy via portfolios (Herfert and Arbige, 2008). Strategic fit can therefore be considered a necessary condition for all the other success criteria (Roussel et al., 1991). Fourth, strategic fit is a critical issue in practice as companies typically only reach 63% of their strategic potential, which is caused by mistakes in planning and execution (Mankins and Steele, 2005). Both these activities hint at operational aspects, which are at the core of project management, thus highlighting the demand to link corporate strategy to project strategy (Morris and Jamieson, 2005). Coulon et al. (2009) advocate this link proposing that companies with a high-quality portfolio management will improve strategic alignment. Lastly, a growing research interest in alignment of business strategy and project management can be noted (Arto and Wikström, 2005; Srivannaboon and Milosevic, 2006), e.g. relating business strategy to single projects (Arto et al., 2008), project management (Anderson and Merna, 2003), programme (Lycett et al., 2004) and portfolio management (Dietrich and Lehtonen, 2005; Herfert and Arbige, 2008). Thus analysing the link of strategy and project portfolio management is a valuable contribution to this literature base.

The challenge of strategic fit arises out of too narrowly defined goals of individual projects. This causes inter-project coordination problems, as the operational context of these projects is not considered (Engwall and Jerbrant, 2003). The problem thereby is twofold: On the one hand, synergies cannot be fully realised if not all corresponding projects are taken into account. On the other hand the overall strategic direction often is not manifested in a single project’s objectives, thus leading to unfocused portfolios that may even contain conflicting projects. Resource allocation according to strategic objectives is suggested as a way of mending an unfocused portfolio (Chao et al., 2009; Hendriks et al., 1999) and of dealing with divergence of actual and optimal alignment in the course of strategy

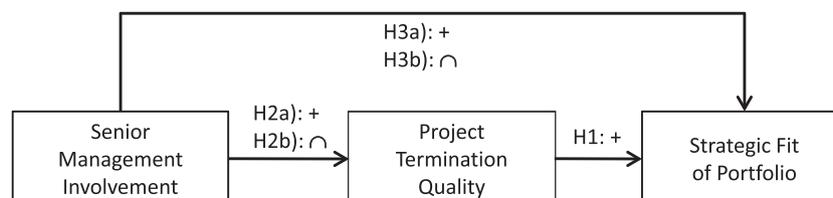


Fig. 1. Hypotheses illustrated in conceptual framework.

implementation (Arto and Dietrich, 2004). Cooper et al. (1998) stress that management needs to deal with strategy implementation through resource allocation, which will effectively address the coordination issue as “strategy begins when you start spending money” (p. 83). This pins down two goals for senior management, to achieve both optimal alignment of projects to one another and overall conformity to corporate strategy.

3.2. Project termination quality

Lingering inappropriate projects have been shown to be a result of dysfunctional management (Green et al., 2003; Schmidt and Calantone, 1998; Tadisina, 1986). There is thus a recognised demand for more quality in deciding and executing single project termination in project portfolio management. In order to achieve success in terms of strategic fit it is hence necessary to detect projects that do not fit anymore and abort them consequently. As the strategic decision-making process has been shown to be related to decision success (Dean, JR. and Sharfman, 1996), we introduce the concept of *project termination quality*. PTQ hereby considers how well the decision-making and termination process is executed, characterising the effectiveness of the abortion process of single projects. This builds on the definition of a terminated project as “(...) one where resources allocated to it, have been withdrawn without the original objectives/purpose having been fully met” (Tadisina, 1986, p. 97). Hence project termination is a kill decision on an individual project that typically happens at a major project milestone (Cooper, 2008). This decision confirms for every remaining project in the portfolio that resource endowment is strategically reasonable. As a consequence of project termination many resources are reallocated (Cooper et al., 1998).

PTQ may result in positive effects on strategic fit due to a number of causes. First, conflicts of resources are reduced due to authoritative processes resulting in clear and final decisions. PTQ thus produces a context that does not allow for distracting activities or deviating investments in non-strategic projects (Chao et al., 2009). On the contrary this creates and enhances an environment favourable for strategic alignment. Second, wasting of resources is stopped as a result of PTQ. The freed resources following effective terminations indicate the (re-)gain of control over investments doomed to be wasted on lost causes (Kumar et al., 1996). This allows pursuing more fitting projects which should increase strategic fit (Fricke and Shenhar, 2000). Third, cancelling inappropriate projects improves the collective quality of a portfolio in terms of fit by rejuvenating and (re-)focusing a muddled portfolio (Cooper et al., 1998). Based on these arguments we propose our first hypothesis:

Hypothesis 1. Project termination quality impacts positively on the strategic fit of the portfolio.

3.3. Senior management involvement

Senior management or the group of a firm’s top executives is according to upper echelons theory the key decision makers of an organisation. They can thus have far reaching influence on the shape of an organisation (Finkelstein et al., 2009;

Hambrick and Mason, 1984). Upper echelons theory states that organisations are a reflection of their top management teams and uses their demographics as proxies to capture underlying differences in values, perceptions and influence on the process of strategic choice and consequent performance (Carpenter et al., 2004). Drawing on this theory, we consider a group of senior managers as key decision makers in project portfolio management, i.e. as crucial for portfolio success. *Senior management involvement* includes all decisions to be taken in a project portfolio context that occur during the following activities: “(1) the initial screening, selection and prioritisation of project proposals, (2) the concurrent reprioritisation of projects in the portfolios, and (3) the allocation and reallocation of resources to projects according to priority” (Blichfeldt and Eskerod, 2008, p. 358). SMI consists of both “passive support”, which is concerned with allocation of sufficient resources, and “active support”, where senior managers are personally involved as visionary or project champion (de Brentani and Kleinschmidt, 2004; Swink, 2000).

Involvement of senior management is necessary to translate strategy into a project portfolio. This is especially true for the top-down approach termed “strategic buckets model” (Cooper et al., 1998), where senior management identifies the strategic fields (=buckets), which then are assigned individual budgets. Apart from this resource allocation to fitting projects senior managers have their chance to implement strategy by imposing authority as they lay down rules, processes and procedures that guide portfolio alignment. Thereby, senior managers constitute a favourable PPM culture. Still conflicts of interest between projects may arise that demand decisive action of senior management. Overcoming such barriers of will by hierarchical power in the role of a champion or power promotor (Gemünden et al., 2007) may be an appropriate way forward to implement strategy through enforcing and protecting fitting projects in project portfolios. SMI thus will impact positively on PTQ as senior management has the authority to lay down the rules and processes for project termination and to enforce efficient application of these standards due to their institutional power (Chakrabarti, 1974).

At the same time there is a tendency of senior management to mentor their pet projects excessively, thereby allocating more resources than justifiable according to strategy or even sticking to a lost cause, known as “escalation of commitment” (Biyalogorsky et al., 2006; Brockner, 1992; He and Mittal, 2007; Schmidt and Calantone, 2002). Balachandra (1984) has shown this phenomenon also in a project management context, where the probability of project termination decreases with increasing support of top management. Thus it may rather be assumed that an excessive involvement will decrease termination quality. Consequently, we propose that there is an optimal level of SMI for PTQ:

Hypothesis 2a. Senior management involvement impacts positively on termination quality.

Hypothesis 2b. The relationship between senior management involvement and project termination quality is inverted u-shaped.

3.4. Senior management involvement and strategic fit

Since senior managers also exert influence on the portfolio by selecting and initiating new projects, their involvement should influence strategic fit not only via termination quality but also directly. SMI per se is one of the most often quoted success factors for all kinds of corporate innovation processes (Pattikawa et al., 2006). The significance of SMI for project management success has been proposed by numerous conceptual studies (Balachandra and Friar, 1997; Montoya-Weiss and Calantone, 1994). In addition, a wide range of quantitative studies has shown a significant positive impact of SMI on single project management (Clift and Vandenbosch, 1999; Gomes et al., 2001; Kruglianskas and Thamhain, 2000; Swink, 2000; Swink et al., 2006). There are however also studies that have inconclusive or negative results. Balachandra (1996) showed that SMI in Japan did not have any impact on project termination, while in the USA, UK and Germany it did. In Gomes et al.'s (2001) study SMI has no significant influence on the final product, and SMI was found to be negatively related to project efficiency by McComb et al. (2008).

SMI as outlined above establishes a general management system for project portfolios, including the dissemination of strategy incorporated into any (re-)evaluation of projects. Such a routine initialised and advocated by senior management does not only allow for strategic conformity, but also delivers stability. Moreover it increases transparency for strategic alignment and will thus lead to increased strategic fit of a portfolio. Nonetheless, senior management may again become overly committed, i.e. meddle or micromanage projects (Kessler, 2000), and stick to projects beyond reason (Balachandra, 1984; Kirytopoulos et al., 2009). We therefore propose our third set of hypotheses on the direct relationship between SMI and strategic fit:

Hypothesis 3a. Senior management involvement impacts positively on the strategic fit of the portfolio.

Hypothesis 3b. The relationship between senior management involvement and strategic fit of the portfolio is inverted u-shaped.

4. Methods

4.1. Sample

Testing of our hypotheses is based on a *longitudinal sample* of project portfolios. This data was collected at two points in time two years apart (hereafter referred to as T1 and T2). To generate an appropriate number of informants, we cooperated with various project management institutions. An invitation letter explaining the study with a call for registration was solicited to all members of these institutions. Afterwards we conducted short telephone interviews with registered parties' representatives to provide for participants' understanding of our research topic and to check for appropriateness of informants. In order to select the correct informant and portfolios comparable in

complexity, we exclusively admitted firms to our study with project portfolios featuring at least 20 projects managed concurrently.

Two informants, one from senior management and a project portfolio coordinator, were identified in every organisation. Senior management informants have decision authority over the firm's project portfolio including decisions to initiate, terminate, or delay projects. They usually held the positions of either chief executive officer, head of business units, or head of R&D. Portfolio coordinators in contrast are those informants who operatively manage the project portfolio on a day to day basis. In some firms strategic Project Management Offices (PMO) are in charge of whole project landscapes which include project portfolio management. For this study a number of heads of PMOs gave judgement on the project portfolio management. The titles of the informants involved included portfolio manager, head of project management office, division manager, or department manager. This multiple informant design on two different management levels was adopted to offer a broader picture of the processes, information flows and responsibilities of the analysed firms. Furthermore, the selected research design controls for common method bias (Podsakoff et al., 2003), because we use the coordinator informant to assess SMI and PTQ and the senior management informant to assess strategic fit.

In T1, we received 134 completed questionnaires by coordinator informants. The answers of senior management in T1 were not used in this study.

Two years later (in T2) we approached the same organisations again and invited them to participate again. The same procedure of mailing and telephone reminders was followed, adhering to the same research design with two informants. In addition, new firms were contacted applying the same routine as in T1. In T2, we received 203 questionnaires from senior management informants and 214 from coordinator informants. For the purposes of this study we can only use the cross-section of firms that participated in *both* T1 and T2, which leads to a longitudinal sample of 54 firms. However, we can use the complete samples of T1 and T2, respectively, to validate the measurement models for our variables.

The final sample consists of firms from different industries: manufacturing (46%), financial services (34%), and other type of services (20%). Of these firms 38% have fewer than 500 employees, 29% have between 500 and 2000 employees, and 33% more than 2000 employees.

4.2. Measures

We use multi-item scales drawn from literature on project portfolio management and related research for SMI and PTQ. All items are measured on a Likert-scale from 1 "strongly disagree" to 7 "strongly agree". *Senior Management Involvement* was assessed by the coordinator informant in time T1 using seven items following Cooper and Kleinschmidt (1995) and Green (1995). *Project Termination Quality* was measured by the coordinator informant two years later in T2. The scale has four items and is conceptually based on Matheson and Menke (1999) and Shafer and Mantel (1989). *Strategic Fit* was

Table 1
Descriptives and correlations.

Variable	Mean	Std. dev.	1	2	3	4	5	6
1 Strategic Fit (T2)	4.84	0.83	1.00					
2 Project Termination Quality (T2)	3.97	1.09	0.47 *	1.00				
3 Senior Management Involvement (T1)	4.41	1.13	0.45 *	0.36 *	1.00			
4 Portfolio Budget	4.00	1.57	0.37 *	0.16	0.09	1.00		
5 Number of Projects (ln)	4.02	1.20	0.31 *	0.22	0.08	0.20	1.00	
6 Internal Project Ratio	0.79	0.34	-0.21	0.04	0.08	-0.08	-0.20	1.00

n=54.

* $p < 0.05$.

assessed by the senior manager informant, also in T2. This construct has five items following Cooper et al. (1998). Furthermore we control for some portfolio characteristics that might impact PTQ or strategic fit. For this purpose we include portfolio budget and number of projects as proxies for the size of the overall project portfolio. *Portfolio Budget* was measured using a single seven-point item asking about the overall budget of the projects in the portfolio (discrete steps from 1="smaller than 5 million Euros" to 7="greater than 200 million Euros"). *Number of Projects in the Portfolio* is the natural logarithm of the average number of projects that are carried out per year. *Internal Project Ratio* is the percentage of projects (from 0 to 1=100%) in the portfolio that have clients internal to the organisation as opposed to external clients.

Item scales were validated using principle components factor analysis followed by confirmatory factor analysis (CFA) (Ahire and Devaraj, 2001). Principal components analysis of all constructs revealed that only the first eigenvalue is larger than one, which supports unidimensionality of the scales (Ahire and Devaraj, 2001). CFA of the constructs show an adequate fit in that the comparative fit index (CFI) exceeds 0.90 and the standardised root-mean-squared residual (SRMR) is below 0.08 (Hu and Bentler, 1998). Item wording for all constructs together with results of the CFA are listed in the

Appendix A. Table 1 displays descriptive statistics and correlations of all variables.

5. Results

Hierarchical multiple regressions are applied to test the hypotheses. As illustrated in Table 2, PTQ has a significant positive impact ($b=0.20$, $p < 0.05$) on strategic fit of the project portfolio, which supports Hypothesis 1. SMI has a significant positive ($b=0.34$, $p < 0.01$), but inverted u-shaped relationship ($b=-0.23$, $p < 0.05$) with PTQ. Consequently Hypotheses 2a and 2b are both supported. This latter finding is graphically represented in Fig. 2. SMI has a significant positive ($b=0.25$, $p < 0.01$) and strong effect on the strategic fit of the project portfolio, hence Hypothesis 3a can also be supported. However, no inverted u-shaped relationship was found between SMI and strategic fit, thus Hypothesis 3b is not supported. The overall model explains 47% of the variance in strategic fit.

6. Discussion

The objective of this paper is to examine the role of SMI for project portfolio success, while investigating the relevance and impact of PTQ. This includes clarifying what PTQ is and how

Table 2
Regression Results.

	Project Termination Quality Model I		Strategic Fit Model II		
	I a	I b	II a	II b	II c
Portfolio Budget	0.07	0.06	0.15 *	0.15 *	0.13 *
Number of Projects in Portfolio	0.17	0.23	0.13	0.16	0.11
Internal Project Ratio	0.19	-0.04	-0.44	-0.53	-0.52
Senior Management Involvement	0.32*	0.34**	0.31**	0.32**	0.25**
Senior Management Involvement Squared		-0.23 *		-0.09	-0.04
Project Termination Quality					0.20*
Constant	2.87**	3.11**	4.05**	4.14**	3.52**
R ²	0.18	0.27	0.40	0.40	0.47
Adjusted R ²	0.11	0.19	0.35	0.36	0.40
F	2.66 *	3.53**	8.05**	6.92**	6.92**
Change in R ²		0.09		0.02	0.05
F		5.96 *		1.85	4.45 *

Unstandardised regression coefficients are reported; all independent variables are assessed by the coordinator informant: senior management involvement is assessed in T1, project termination quality in T2; strategic fit is assessed by the senior management informant in T2; n=54.

* $p < 0.05$.

** $p < 0.01$.

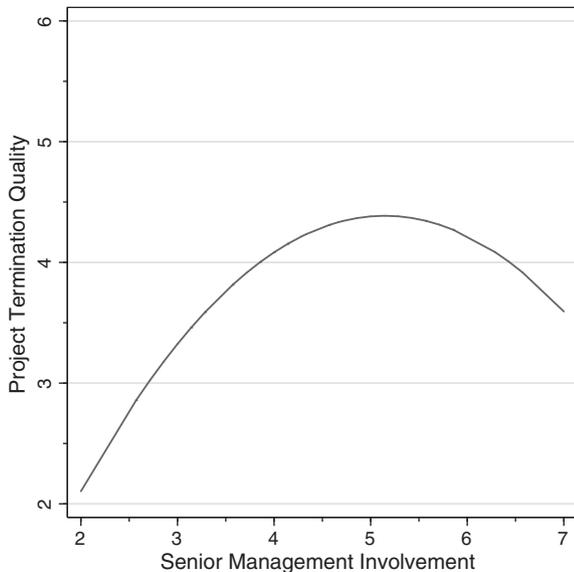


Fig. 2. Inverted u-shape relationship of PTQ and SMI (graphical representation).

it is relevant for strategic fit. Four findings of this study are worth discussing:

First, in our framework strategic fit is positively influenced by SMI, which acknowledges the importance of SMI as shown in past studies (Cooper and Kleinschmidt, 1995; Johne and Snelson, 1988a). This positive relationship between SMI and strategic fit emphasises that senior management can facilitate strategic alignment and thus directly implement advocated strategy. For senior managers this calls for a re-focus from the need of doing the projects that are sound taken individually (Cooper et al., 2000) to the demand of executing “fitting” projects to corporate strategy. It also reveals the significance of selecting fitting projects rigorously before including them to the project portfolio. The hypothesised inverted u-shaped relationship between SMI and strategic fit could not be identified. A reason might be that the effect is rather small, which would require a larger sample size to detect it. Also, the positive effects might be inflated and therefore overcompensate the negative effects. A highly involved senior manager is likely to judge strategic fit of a portfolio more positively than a less involved one.

Second, we also find an indirect relationship between SMI and strategic fit. Here PTQ is identified as integral aspect that impacts positively on strategic fit. The positive relationship between PTQ and strategic fit means that it is vital to ensure correct and strict termination: projects not in line with corporate strategy should be detected timely and terminated rigorously (Boulding et al., 1997; Kumar et al., 1996). Our finding moreover clarifies a potentially negative influence extending from SMI, indicated by previous studies (Balachandra, 1984; Ernst, 2001). SMI’s overall positive impact on PTQ shows that SMI is required to induce sustained termination decisions (Crawford et al., 2008). Consequently, once a single project is identified for termination, it needs to be discontinued irrevocably in order to effectuate an overall improved strategic fit of the portfolio. Finally, SMI’s inverted u-shaped relationship towards PTQ also shows that there is a dark side to SMI. This means that too heavy involvement (i.e. intervention or micro-

management) may lead to an over-steering of the portfolio, typically manifested in continuing sick pet projects (Bonner et al., 2002).

This paper makes several contributions by clarifying the contradictory findings on SMI from past studies (Balachandra, 1996; Brockhoff, 1994; de Brentani et al., 2010; Gomes et al., 2001; McComb et al., 2008). First, although we confirm SMI as an important success factor (Cooper and Kleinschmidt, 1995), we show that there is an optimal degree of SMI for PTQ. The adopted multi-project perspective (Söderlund, 2004) also newly outlines PTQ and adequate involvement as particular predictors for project portfolio success. This implies different meanings for success factors on a project portfolio level compared to single project management (Arto et al., 2009). This is exemplified for SMI under the aspect of “resource allocation”: In a single project context, quantity of available resources positively influences success, i.e. the more resources assigned to a project the more likely it is that this project is completed successfully (Gomes et al., 2001). On a project portfolio level however resources endowed or withdrawn according to a project’s congruence to corporate strategy are fundamental for strategic fit, thus portfolio success. This implies that adequacy of endowment is crucial on a project portfolio level, as shown in this study. Second, with the construct PTQ we propose a lever to achieve systematic and effective project termination, a necessary condition for strategic fit (Kumar et al., 1996). While success factors of project portfolio management have been put forward some time ago (Ernst, 2002; Johne and Snelson, 1988b), the underlying mechanisms that interact between processes and the role of senior management are detailed in this study. Lastly, this study sheds light on the link between strategy and project portfolio management, thus adding a fresh perspective to the current debate by providing quantitative evidence for the importance of strategy implementation for portfolios (Arto et al., 2008; Srivannaboon and Milosevic, 2006).

6.1. Implications for management

This study has some implications for *senior managers* regarding the necessity of termination and the impact of their involvement in project portfolio management. SMI should be adequate in intensity, encouraging managers to choose an appropriate management style (i.e., beware of over-steering the portfolio) that is considered essential in project portfolio management (Fricke and Shenhar, 2000). This may help to overcome fear and reluctance to terminate rigorously. It also highlights the importance of diligent selection of projects upon entry in the project portfolio (Ghasemzadeh and Archer, 2000). Rigorously resorting to a strict selection routine and standardised termination process will lead to transparency and thus better decisions, and ultimately to adequate allocation of resources (Blichfeldt and Eskerod, 2008). Moreover, a *structured process*, as well as early detection and abortion of projects can help to eliminate delays which may save the organisation considerable money (Kumar et al., 1996). *Project portfolio coordinators* benefit from this study indirectly as they learn about a number of activities that should not be part of their job description: decisions on project termination, as well as project selection are shown to be outside scope. So a clearer role understanding for project portfolio coordinators and portfolio review board or

strategic PMOs, when considered as joint group of project portfolio managers, is delivered here. This contribution to role clarity helps project portfolio coordinators to better position as actors in PPM. Thus they can be assumed to perform more effectively when it is clear what needs to be done and what not (Hall, 2008; Tubre and Collins, 2000).

In summary, the findings encourage senior management to assume their role as strategic managers by adopting and cultivating a pro-active project portfolio culture in which termination of projects is not considered a failure, but a valid option. Their focus should also be on effective communication, which will encourage other stakeholders of the project portfolio to openly and truthfully report on project proposals and progress. This way of reporting is also considered a critical success factor in project portfolio management (Herfert and Arbige, 2008).

6.2. Limitations and future research

As with every empirical study there are some limitations that need to be taken into account. First, this study relies on a relatively small sample size. This is due to the longitudinal research design with multiple informants. Gathering information from two informants repeatedly at two points in time is difficult, as they might have moved on to other jobs or even left the company. Even though, small sample sizes increase the probability of type II error. Non-significant relationships such as H3b might therefore still be present and should be re-examined in future studies. However, the significant findings of this study can be considered much stronger than in single-informant and cross-sectional studies. The results are neither prone to common method bias due to multiple informants nor to hindsight bias by measuring with an interval of two years. Both issues have been noted as potential methodical problems in research on SMI (Bonner et al., 2002). A second limitation might be that the factor SMI comprises a rather broad set of items that cover different elements of management involvement, such as attention, resource allocation, and decision-making. While this enables us to include different aspects of SMI, which in their entirety comprise the construct of SMI. Finally, role conflicts during the decision-making process are not included in this study, but could be critical for the effectiveness of senior managers. There are three possible sources for role conflict: First, there might be conflicts between different management roles in PPM, e.g., between senior managers and middle managers such as the portfolio coordinator (Jonas, 2010). Especially in the context of strategy implementation the interface between senior and middle management is critical and worthwhile for future investigations (Raes et al., 2011). Second, there could be a lack of consensus *within* the senior management team (Knight et al., 1999). In the context of project termination, these types of conflicts might be fruitful to analyse. Third, there might also be multi-role conflicts for senior managers who are also project owners, which poses additional challenges.

Future studies could investigate different types of involvement separately and evaluate their respective impacts on termination quality and project portfolio success. Alternatively, it may be of interest to consider different influential roles that

operate simultaneously in a project portfolio context and to shed light on role conflicts. Focus may be the whole group of senior managers involved in project portfolio management like portfolio boards (Arto and Dietrich, 2004), steering committees (Lechler and Cohen, 2009) or also project portfolio management offices (Unger et al., 2011). The composition of senior management groups might have an essential impact on portfolio decisions (Talke et al., *in press*). Distinct senior management roles could be considered that pose contradictory effects in their involvement, e.g. in termination decisions towards project portfolio success (Dilts and Pence, 2006). Here an empirical study may be especially valuable to contrast and measure the impact of line management and heavy weights of the temporary organisation context on project portfolio success. Conflicting effects might be a symptom of wrong management involvement (Jonas, 2010; Laslo and Goldberg, 2008).

Appendix A.

Strategic fit of portfolio (measured in T2, Senior Manager, 5 items, Alpha = 0.78, CFI = 0.95, SRMR = 0.052)

- FIT1 Our project portfolio is aligned to generate a constant cash-flow.
- FIT2 Our project portfolio is consistently aligned with the firm's future.
- FIT3 The corporate strategy is implemented by our project portfolio in an optimal way.
- FIT4 Project's resource allocation reflects our strategic objectives.
- FIT5 Through the analysis of our project portfolio we receive valuable impulse for our strategy.

Project termination quality (measured in T2, Coordinator, 4 items, Alpha = 0.62, CFI = 0.96, SRMR = 0.045)

- TQ1 Unnecessary projects are promptly detected.
- TQ2 Unnecessary projects are promptly aborted.
- TQ3 Once a project has been approved it is only rarely aborted again.^R
- TQ4 We do not regard abortion of projects as failure.

Senior management involvement (measured in T1, Coordinator, 7 items, Alpha = 0.89, CFI = 0.96, SRMR = 0.042)

- SMI1 Our senior management has expert knowledge in multi-project and project portfolio management.
- SMI2 Our senior management invests a lot of time in steering the project portfolio.
- SMI3 Our senior management makes sufficient human and financial resources available for the steering of the project portfolio
- SMI4 Our senior management adheres to the official process and to its own rules during project portfolio management.
- SMI5 Our senior management delivers decisions timely when problem situations arise or escalation is required.

- SMI6 Our senior management feels responsible for the success of the project portfolio management.
- SMI7 On the whole, our senior management supports the project portfolio management

^R This item is reverse coded.

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