Project governance, benefit management, and project success: Towards a framework for supporting organizational strategy implementation

Ata ul Musawir [a,*], Carlos Eduardo Martins Serra [b], Ofer Zwikael [c], Imran Ali [d]

[a] *Faculty of Built Environment, University of Malaya, Jalan Universiti, Wilayah Persekutuan, 50603 Kuala Lumpur, Malaysia*
[b] *Independent Researcher, 153 Poynter House, 1 Queensdale Crescent, London W11 4TD, United Kingdom*
[c] *College of Business and Economics, Australian National University, 26C Kingsley St, Acton ACT, 2601, Canberra, Australia*
[d] *Department of Business Administration, Faculty of Economics and Administration, King Abdulaziz University, P.O Box 80201, Jeddah 21589, Saudi Arabia*

Abstract

There is growing pressure on project managers to demonstrate the value of their projects to the funding organization. However, most projects lack a robust process for realizing such strategic value. While the literature recognizes the importance of project governance for enabling benefits realization, this research area lacks empirical evidence. Accordingly, this paper analyzes the relationships between effective project governance, benefit management, and project success. A scale for evaluating effective project governance was developed and validated based on feedback from 21 project governance experts. Subsequently, an international survey of 333 projects was used to test proposed relationships. The results indicate effective project governance improves project success both directly and through an enhanced benefit management process. Additionally, the most effective project governance and benefit management practices for improving project success are identified, such as the development and monitoring of a high quality project business case. The resulting model sets the foundations for a theory that explains how effective project governance enhances project success and enables the realization of strategic objectives through projects.
© 2017 Elsevier Ltd, APM and IPMA. All rights reserved.

Keywords: Project governance; Benefit management; Benefits realization; Project success; Organizational strategy

1. Introduction

A large proportion of projects do not meet their objectives (APM, 2015; PMI, 2015; Standish Group, 2015) and only 40% of project objectives are aligned with organizational strategy (KPMG, 2010; PMI, 2014). This is especially concerning at a time when there is mounting pressure from senior management on project managers to demonstrate project benefits to the organization funding the project (hereafter, "funding organization"), as

well as contribution to organizational strategy implementation (Lappe and Spang, 2014; Mir and Pinnington, 2014). To achieve this, a robust Benefit Management (BM) process is required for the active management of, and continuous alignment between, project outputs, outcomes, benefits, and organizational strategy (Zwikael and Smyrk, 2015).

However, many organizations continue to struggle with the implementation of a comprehensive BM approach (Breese et al., 2015) and therefore fail to maximize the return on their project investments (KPMG, 2010). According to a report by the Project Management Institute (PMI, 2016c), only 17% of organizations report a high level of benefits realization maturity and this figure has remained unchanged from 2014 to 2016. Additionally, only about half of organizations report frequently

* Corresponding author.
  E-mail addresses: ataulmusawir@live.com (A. Musawir),
carlos.serra@hotmail.co.uk (C.E.M. Serra), ofer.zwikael@anu.edu.au
(O. Zwikael), imranalinim@gmail.com (I. Ali).

identifying benefits that are aligned to strategic objectives (PMI, 2016d). Furthermore, whereas benefits are often considered during the early stages of projects, they tend to be forgotten and are not actively managed during the later stages (Ashurst et al., 2008).

Various studies have examined the factors that facilitate the implementation of a disciplined and consistent BM approach in projects (Doherty et al., 2012; Hesselmann and Kunal, 2014; Paivarinta et al., 2007). Among these, project governance is one of the most prominent factors (Bradley, 2010; Doherty et al., 2012; Sankaran et al., 2007; Turner et al., 2010). A strong governance framework provides the structures, roles, and accountabilities that enable effective BM (Ahlemann et al., 2013; Sapountzis et al., 2009). This should, as a result, ensure that project outputs and outcomes are continuously aligned with the benefits envisioned in the project's business case (Hjelmbrekke et al., 2014).

However, there is a lack of understanding in the existing literature regarding the governance mechanisms that facilitate the adoption and implementation of BM practices (Doherty et al., 2012; Hesselmann and Kunal, 2014). This is exacerbated by the lack of empirical research examining the relationship between the two concepts. Furthermore, it is not clear if a comprehensive BM approach enabled by effective project governance would actually translate into a significant and positive impact on overall project success. To that end, this paper seeks to address the following research questions: (1) What is the nature of the relationship between effective project governance and benefit management?; (2) Do effective project governance and benefit management improve project success, and if so how?; and (3) What project governance and benefit management practices are most effective in improving project success?

To address these questions, this study uses survey data pertaining to 333 projects from various industries and countries to empirically investigate the relationship between Effective Project Governance (EPG) and BM, as well as their effects on three dimensions of project success (Zwikael and Smyrk, 2012): Project Management Success (PSMS), Project Ownership Success (PSOS), and Project Investment Success (PSIS).

This paper contributes to the existing research on the factors that facilitate the adoption and successful implementation of BM practices. Also, it addresses the need for an operationalization of project governance (Pitsis et al., 2014) by developing and validating a new EPG scale. Furthermore, it contributes to the growing literature on the expanded and multi-dimensional criteria for project success. Overall, this study develops the foundations of a framework for supporting organizational strategy through projects.

Before proceeding further, it is important to clarify the reasons for studying BM at the project level. It is commonly understood that benefits are mostly realized after project delivery (Breese, 2012; Thorp, 2001) and hence the responsibility for benefits realization falls mainly upon the program or corporate management (Office of Government Commerce, 2009). This may lead one to believe that BM is mainly relevant at the program level. We refute this notion for two reasons. First, stand-alone projects can also realize benefits (Serra and

Kunc, 2015) even if they are not part of a program. Similarly, some organizations do not apply a formal or specific approach for program management but instead treat programs as large projects, which often realize benefits. For these projects in particular, BM is a relevant and important topic. Second, a consistent BM process is required throughout the life cycle of every project to ensure that expected outputs and outcomes are aligned with the end benefits to be realized (PMI, 2016a). This is also necessary to ensure the smooth handover of benefits from project management to program management, line management, or corporate management upon delivery, as described in the Projects in Controlled Environments (PRINCE2) methodology (Office of Government Commerce, 2009). Therefore, we argue that BM is relevant even for projects that do not directly realize end benefits. Hence, it is vital to study BM at the project level and examine its effect on overall project success.

The remainder of this paper is organized as follows. Section 2 reviews the relevant literature pertaining to each of the three main variables and, subsequently, the conceptual framework and hypotheses are developed. Section 3 details the methodology of the study as well as the development and validation of the EPG scale. This is followed by the results and discussion of findings in Sections 4 and 5 respectively. Finally, the implications and limitations of the study are discussed in Section 6.

2. Theoretical background

2.1. Effective project governance (EPG)

There are wide variations in how project governance is understood and defined (Bekker and Steyn, 2009; Roe, 2015; Sankaran et al., 2007), often depending upon the technical background and research fields of the authors (Bekker, 2015). As a result, there is generally a lack of a consensus on a single definition of project governance (Roe, 2015), as evidenced by the diverse terminology used in the literature (Ahola et al., 2014). Müller (2009, p. 4) defines project governance as "…the value system, responsibilities, processes and policies that allow projects to achieve organizational objectives and foster implementation that is in the best interest of all stakeholders, internal and external, and the corporation itself." Garland (2009, p. 10) defines it simply as "the framework within which project decisions are made".

While strategic alignment of project objectives has always been one of the functions of project governance, it is increasingly being stated more explicitly (e.g. Samset and Volden, 2016). Strategic alignment is also included in the definition of project governance in PMI's practice guide for the governance of portfolios, programs, and projects: "the framework, functions, and processes that guide project management activities in order to create a unique product, service, or result to meet organizational strategic and operational goals" (PMI, 2016b, p. 4). Similarly, the Association for Project Management (APM) advocates strategic alignment as an important principle of good governance (APM, 2012). In line with the above, this paper adopts the strategy-oriented view of project governance.

Various theoretical lenses have been used to explain project governance. Agency theory is one of the most common perspectives in project governance research (Biesenthal and Wilden, 2014). It is concerned with managing the conflict of interest that arises from separation of ownership (the principal) from control (the agent), where each party is concerned with its own self-interest (Ross, 1973). Agency costs are incurred when controls are applied to ensure that the agent acts in the best interests of the principal. Conversely, stewardship theory views the agents as stewards who act in the best interests of the principal (Davis et al., 1997) and should be guided rather than controlled. Stakeholder theory, as applied to project governance research, recognizes the importance of relevant internal and external stakeholders and the need to address their legitimate interests (Donaldson and Preston, 1995). The alternative perspective, shareholder theory (Friedman, 1962), is often discussed in governance at the corporate level but has not been as relevant governance at the project level (Biesenthal and Wilden, 2014).

Another prominent theoretical perspective in project governance is the Transaction Cost Economies (TCE) theory (Ahola et al., 2014). TCE theory states that every economic exchange has a cost, termed 'transaction cost', and organizations act to minimize these costs (Williamson, 1979). It shares some similarities with agency theory in that they both seek to curb opportunism and self-interest through governance mechanisms (Kochhar, 1996). However, while Agency theory focuses on the principal-agent relationship, TCE theory focuses on individual transactions. Institutional theory has also been studied in the context of project governance (Müller et al., 2015). It asserts that organizations are affected by their institutional environment (DiMaggio, 1988) and exhibit varying levels of conformance through institutional isomorphism (Meyer and Rowan, 1977).

The complexity of project governance suggests that a single theoretical perspective may not be adequate to fully understand the underlying mechanisms through which it improves project success. The choice of governance structure would ultimately depend on the context of the project, such as the level of risk (Zwikael and Smyrk, 2015) and the nature of assets involved (Hoetker and Mellewigt, 2009). Therefore, an in-depth understanding of project governance may reside at the confluence of various theories, including those not listed above, while taking into consideration the project context.

However, there are certain limitations to the applicability of corporate governance theories to project governance. The relationship between the project and its funding organization may not always be directly comparable to the relationship between an organization and its investors. For example, the boundaries between the project and the organization may not always be clearly defined. Also, the contribution of the project to the funding organization is not always easily measurable or quantifiable (PMI, 2016a). There is a lack of a theory on project governance that addresses the complex relationship between the project and the organization, and identifies the processes through which project governance improves project success. Accordingly, this paper examines the potential role of BM as a strategic process through which project governance can enhance project success.

2.2. Benefit management (BM)

A 'benefit' is defined as a flow of value that occurs when project outputs are used by customers (Zwikael and Smyrk, 2012). Benefits are the reason organizations undertake project investments (Thorp, 2007) and are the ultimate deliverables (Bradley, 2010). For example, the success of the Sydney Opera House was not because of its project efficiency (high time and cost overruns) (Jones, 2006), but due to a continuous flow of income from visitors, as well as increased reputation for Sydney as a tourist destination. Benefits may be objective and quantifiable, such as revenue generation and cost savings (NSW Office of Finance and Services, 2015), or subjective and unquantifiable, such as customer satisfaction and brand image (PMI, 2016a). Benefits support organizational strategy by bridging the gap between current value and desired value (Serra and Kunc, 2015). This requires a consistent approach to the alignment of project outputs, outcomes, benefits, and strategic objectives (PMI, 2016d; Thorp, 2007).

Benefit Management (BM), also known as Benefits Realization Management (BRM) (Breese, 2012), is defined as a set of processes that ensure that projects, programs, and portfolios embed the requirements of business strategies into business-as-usual, in order to create value in a meaningful and sustainable manner (Serra, 2013). The crux of the BM approach is to begin with the investment objectives in mind (Jenner, 2012) and work backwards to determine what is required to achieve that end goal. A holistic BM approach begins at the project selection stage, where executive leaders, business owners, and project professionals collaborate to identify the potential benefits of investment opportunities (PMI, 2016d). Target benefits are then formulated and stated in the business case of each concerned project for approval by the project funder (Chih and Zwikael, 2015; Jenner, 2015). These target benefits are subsequently tracked, reviewed, and aligned with the needs of relevant stakeholders during the course of the project (PMI, 2016a). Finally, the benefits are realized or 'harvested' (Morris, 2004), which may occur during the course of the project, at project delivery, or, more commonly, after project delivery (Breese, 2012; Thorp, 2001). Thus, BM takes place before, during, and after the typical life cycle of a project.

Despite their significance, BM practices are still lacking widespread adoption (APM, 2009; Coombs, 2015; Ward et al., 2007). A fundamental limitation is that the BM field is still in its relative infancy (Breese et al., 2015; Doherty, 2014; Zwikael, 2016) and a significant amount of work is required to develop the underlying theory as well as models and tools to guide practice (Breese, 2012). Another major challenge is that while BM has become a staple of effective program management (Office of Government Commerce, 2007), it still lacks widespread recognition at the project level. As a result, project managers are often sidelined from the benefits conversation (Serra and Kunc, 2015) despite the fact that the project manager's expertise and support are vital for effective

BM (Jenner, 2015; PMI, 2016a). Furthermore, perhaps the biggest challenge to BM adoption is that many organizations still do not recognize and/or measure project benefits realization as a criterion for project success (Atkinson, 1999; Cooke-Davies, 2002). Therefore, this paper seeks to highlight the need to apply a comprehensive BM approach at the project level and to identify the BM practices with the highest impact on project success.

2.3. Project success

There is growing recognition among project management academics and practitioners that the conventional 'triple constraint' or 'Iron Triangle' project success criteria of cost, time, and scope/quality is incomplete (Andersen, 2014; Atkinson, 1999; Baccarini, 1999; PMI, 2016a). As the focus of projects shifts from product creation to value creation (Winter et al., 2006), it is necessary to expand these criteria to include the full range of value delivered by the project, which covers not only project outputs and outcomes but also benefits (PMI, 2016a).

Additionally, the concept of project success may be more complex than a binary outcome between success and failure. Cases such as the Sydney Opera House and the Hubble Telescope indicate that while a project may be a failure in terms of output efficiency, it may still be a success in terms of investment effectiveness (Shenhar and Dvir, 2007). Likewise, a project that delivers the required outputs within budget, schedule, and quality constraints may not necessarily be a successful investment if it does not produce the target benefits (PMI, 2016a). Furthermore, the notions of 'success' and 'failure' of projects may be contestable depending on the context, for example the cancellation of a project due to changing business conditions may not necessarily indicate a failure (Jenner, 2015). Due to these factors, existing estimates of project success rates may not provide an accurate picture (Jenner, 2015; Zwikael and Smyrk, 2012).

To address the complexity of project success, there is a need to conceptualize it as a multi-dimensional construct. Andersen (2014) differentiates between project management success and project product success. The former represents the traditional triple constraint criteria while the latter encompasses the satisfaction of the strategic objectives of the project owner and the needs of other stakeholder groups, including the project user/customer (Baccarini, 1999). A similar distinction between project management success and project success was developed by Ika (2009) and this view has been accepted and applied by various studies (Abednego and Ogunlana, 2006; Badewi, 2015; Locatelli et al., 2014).

In line with this distinction, we adopt the 'triple-test performance framework' proposed by Zwikael and Smyrk (2012), which builds upon this concept by breaking down project success into three dimensions:

- *Project management success* (*PSMS*), which relates to the triple constraint criteria and is a measure of the project manager's performance in achieving the project plan as judged by the project owner

- *Project ownership success* (*PSOS*), which is a measure of the project owner's performance in realizing the business case as judged by the project funder
- *Project investment success* (*PSIS*), which is a measure of the actual value generated by the project investment as judged by the project funder

The latter two dimensions overcome the disconnection identified in the literature between the delivery of project outputs and the realization of investment objectives. Moreover, whereas previous literature focused on analyzing project success from the performing organization's perspective, PSOS and PSIS analyze project success from the funding organization's point of view, where benefit realization is most relevant. It is argued that the inclusion of these criteria provides a more complete view of project success.

2.4. Conceptual framework: effective project governance, benefit management, and project success

Recent research in project management increasingly advocates the need for organizations to focus on project benefits realization (Breese, 2012; Jenner, 2015; PMI, 2016a). The role of effective governance as a key enabler for effective BM is identified by various studies (Ahlemann et al., 2013; Hjelmbrekke et al., 2014; Sapountzis et al., 2009; Thorp, 2007). Similarly, the role of governance in facilitating BM is recognized in major project management standards such as PRINCE2 (Office of Government Commerce, 2009) and Managing Successful Programmes (MSP) (Office of Government Commerce, 2009) as well as governance guidelines such as the Control Objectives for Information and Related Technologies (COBIT) framework (IT Governance Institute, 2007) and APM's Guide to the Governance of Project Management (APM, 2011). Clearly, effective governance has a role to play in BM adoption and implementation. However, the governance mechanisms that enable BM are underexplored in the literature (Doherty et al., 2012; Hesselmann and Kunal, 2014) and a closer look is warranted.

The fundamental aim of an Effective Project Governance (EPG) system is to align project goals with the funding organization's objectives and strategy (APM, 2012; Biesenthal and Wilden, 2014; PMI, 2016b). Therefore, EPG must ensure that projects generate the required outputs and outcomes that lead to the desired benefits identified in their respective business case. Hence, the ultimate aim of the EPG system is to realize the expected project benefits (Sankaran et al., 2007). This would require an active and structured approach to planning the expected benefits, aligning them with stakeholders' requirements, and making the required changes to enable their realization, i.e. a process for managing benefits (PMI, 2016a). Therefore, it follows that an EPG system should facilitate the adoption and implementation of BM practices in one form or another.

EPG can enable BM practices in various ways. The lack of benefits ownership is a major impediment to the effective implementation of BM practices (Coombs, 2015; Ward and Daniel, 2013). An EPG system can help overcome this challenge

by establishing clear roles and responsibilities (Sapountzis et al., 2009) as well as developing a framework of accountabilities for benefits analysis, planning, and realization (Ahlemann et al., 2013; Badewi, 2015; Zwikael and Smyrk, 2015). Additionally, the governance system can induce benefits ownership by defining benefits-related goals and creating incentives for the adoption and implementation of BM practices (Ahlemann et al., 2013).

Another major obstacle to effective BM is the lack of top management support and leadership (Doherty et al., 2012). In an EPG system, the project owner together with the project board play a vital role in addressing this issue by providing the necessary resources and top management support for BM (Paivarinta et al., 2007). At the same time, they can authorize the development of necessary organizational processes to facilitate BM practices (Bradley, 2010; Hesselmann and Kunal, 2014). Furthermore, they can help guide the BM process by continuously aligning project target benefits with organizational objectives and strategy (Hjelmbrekke et al., 2014).

The above arguments suggest that EPG is an important foundation for effective BM (Jenner, 2014). Likewise, an inappropriate governance framework can be a major challenge for the successful adoption and implementation of BM practices (Breese et al., 2015; Doherty et al., 2012). Therefore, in line with the above, the first hypothesis suggests:

H₁. There is a positive relationship between effective project governance and benefit management

As the emphasis on BM practices increases, it is pertinent to examine the effects of BM practices on project success. Essentially, a robust benefits evaluation and measurement process enables organizations to maximize their returns from project investments (KPMG, 2010; PMI, 2016a). The BM process serves as a central tool for defining project requirements and acceptance criteria, informing the project business case, identifying risks, engaging stakeholders, and monitoring the benefits realization process (Bradley, 2010). This notion is corroborated by the findings of Ward et al. (2007), which indicate that organizations possessing a strong benefits orientation were more likely to be successful in achieving target benefits from projects. Benefits create the desired value for the funding organization (Serra and Kunc, 2015) and directly support the achievement of its investment objectives for undertaking the project (Coombs, 2014). Therefore, benefits are the ultimate deliverables of the project (Bradley, 2010) and benefits realization is an integral dimension of project success (Cooke-Davies, 2002). Hence, it follows that effective BM practices would have a positive effect on project success.

Recent studies have also provided some initial empirical support to the theorized relationship between BM and project success. Serra and Kunc (2015) found that BM practices predict 42% to 47% of the variance in consolidated dimensions of project success. Similarly, Badewi (2015) found that BM practices have a significant and positive impact on project investment success. Furthermore, research by PMI (2016a, 2016d) suggests that maturity of BM practices is positively correlated with both project management performance and project investment performance. In line with these findings, the second hypothesis suggests:

H₂. There is a positive relationship between benefit management and project success.

The direct relationship between effective governance and project success has also been discussed in the literature from various perspectives. The fundamental aim of the EPG system is to steer the project management function (Too and Weaver, 2014) and align project objectives with those of the funding organization (Levie et al., 2017). EPG provides a disciplined approach to track and communicate project progress, which allows stakeholders to understand and influence project decision-making (Bowen et al., 2007). Similarly, Brunet and Aubry (2016) proposed that EPG in public projects allows for better, more rational decision-making and improved stakeholder management. Furthermore, Zwikael and Smyrk (2012) found that EPG creates the framework of accountabilities that ensure projects realize their business case.

EPG also influences project success through other mechanisms. For example, Joslin and Müller (2015) posited that an organization's governance orientation may influence the selection and implementation of a project management methodology and moderate its effect on project success. Similarly, Abednego and Ogunlana (2006) found that good governance improves project performance by facilitating timely and effective risk allocation and control. Furthermore, Liu et al. (2016) found well-defined and responsive governance structures to be a critical success factor for Public-Private Partnership (PPP) projects.

Empirical research on the relationship between EPG and project success is sparse (Biesenthal and Wilden, 2014; PMI, 2016b) but indicates a positive trend. A study by APM (2015) found that among success factors, good governance has the strongest and most consistent relationship with all dimensions of project success. Bernroider et al. (2014) found IT governance to have a significant positive impact on Enterprise Resource Planning (ERP) project success. Additionally, Lu et al. (2015) found both contractual and relational forms of governance to have a significant positive impact on construction project performance. Conversely, governance failure is consistently found to be one of the most prominent causes of project failure (Jenner, 2015; Van Marrewijk et al., 2008) in projects of all sizes, including large-scale projects (Patanakul, 2014) and megaprojects (Flyvbjerg et al., 2003). A misaligned or underdeveloped EPG system renders projects inflexible and unable to respond to the dynamic business environment (Too and Weaver, 2014). Hence, an EPG system can help organizations not only improve project success but also avoid the common causes of project failure (APM, 2011). Accordingly, the third hypothesis states:

H₃ₐ. There is a positive relationship between effective project governance and project success.

The previous hypothesis posits a direct relationship between EPG and project success in line with various empirical studies (Abednego and Ogunlana, 2006; APM, 2015; Joslin and Müller,

2016). However, the mechanisms through which governance improves project success are underexplored in the literature. In the preceding discussion, we highlighted the role of EPG in facilitating the adoption and implementation of BM practices (Ahlemann et al., 2013; Badewi, 2015; Zwikael and Smyrk, 2015). Subsequently, we discussed the role of BM in improving project success (Badewi, 2015; PMI, 2016d; Serra and Kunc, 2015). Hence, it logically follows that enabling effective BM may be one of the mechanisms through which EPG improves project success. Doherty (2014) emphasize the need to view success factors as interdependent constructs that may operate in a complementary fashion. Accordingly, we posit that the effect of EPG on project success should be due, at least in part, to its enabling effect on BM. Therefore, we propose a competing mediation hypothesis as follows. Finally, all hypothesized relationships are summarized in Fig. 1.

H₃ᵦ. Benefit management mediates the relationship between effective project governance and project success.

3. Methodology

This study adopts the philosophical lens of post-positivism to analyze the theoretical model. Post-positivism employs a deterministic view of the world and seeks to identify and assess causes that influence outcomes (Creswell, 2014). It fits well with social sciences research and has emerged as the predominant philosophy for quantitative research in social sciences (Teddlie and Tashakkori, 2009). A deductive approach was used to test the proposed causal links (Saunders et al., 2009). Quantitative data were collected using a cross-sectional survey design.

The unit of analysis is the individual project. However, it should be noted that the project is not an isolated entity and is influenced by the contextual factors of the organization(s) within which it is situated (Engwall, 2003). Therefore, while the project success variable may be attributed to an individual project, the effective project governance and benefit management variables may involve structures and processes beyond the boundaries and life cycle of the individual project. Hence, the relevance of the findings is not limited to the project level.

3.1. Sampling

Data collection was conducted through the professional networking site LinkedIn. A total of 1272 project management practitioners were identified, based on their current job titles (e.g. project manager, project owner, project sponsor), and invited to participate through a link to a web-based survey. Since the unit of analysis for this study is the individual project, respondents were not targeted or segregated based on their present organization. Instead, respondents were asked to provide data about a single project they were involved in that was completed not more than two years ago, in order to mitigate loss of detail and inaccuracies in the data provided (Iarossi, 2006). Data were collected over a period of 6 weeks ending March 2016, which included two reminders at two-week intervals. The main sample demographics are summarized in Table 1.

A total of 344 responses were received, out of which one had missing data due to a server-side system issue and ten were found to be unengaged responses, i.e. standard deviations between responses for the main variables of study were < 0.30, and therefore were removed. This left 333 usable responses, which is a response rate of 26%. While the response rate is slightly lower than similar studies (e.g. Serra and Kunc, 2015), the findings of Visser et al. (1996) and Keeter et al. (2006) suggest that this may not significantly affect the validity of the results of the present study.

Nonresponse bias was tested using the time-trend extrapolation procedure outlined by Armstrong and Overton (1977), which is a suitable technique for web-based surveys (Atif et al., 2012). A comparison of the first and last quartiles of the responses using *t*-tests across all constructs did not reveal any nonresponse bias in the data. Furthermore, to mitigate same-source bias, respondents were asked to report project management success from the project owner's perspective, and to report project ownership and investment success from the project funder's perspective. Definitions of the two roles were provided in the survey.

The project owner and project funder roles were found to be separate in 66% of projects but were performed by the same person or entity in the remaining projects. The mean experience of respondents of being involved in projects and programs was 16.75 years, with a range of 1 to 51 years. Furthermore, 74% of respondents indicated possessing a PMP qualification. However, only 4% of respondents possessed professional qualifications related to BM.

3.2. Measures

Pitsis et al. (2014) highlighted the lack of an operationalization and measurement scale for project governance in the literature. To address this gap, this study developed a scale for Effective
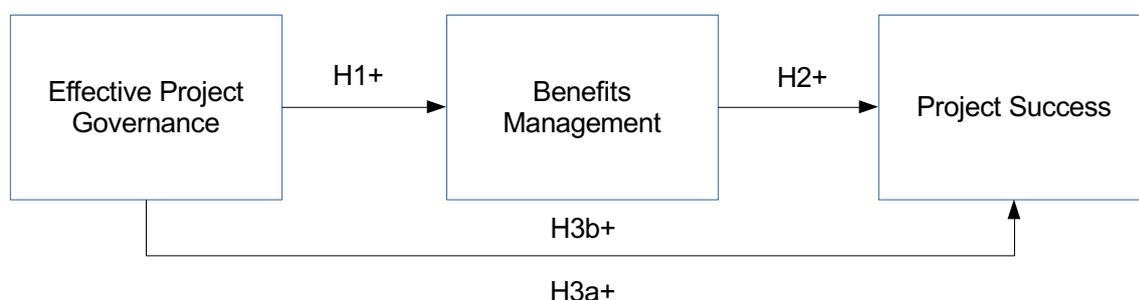

Fig. 1. The theoretical model.

Table 1
Sample demographics.

Variable	Responses	
Project type	N	%
IT/software	160	48.0
Engineering/construction	45	13.5
Organizational/business change	73	21.9
Public administration/development	8	2.4
Product development/R&D	29	8.7
Other (27 industries)	18	5.4
Project cost (USD)	N	%
<0.5 million	57	17.1
0.5–1.0 million	59	17.7
1.0–5.0 million	99	29.7
>5 million	100	30.0
Don't know/don't want to disclose	18	5.4
Respondent's role	N	%
Project governance/PMO	64	19.2
Project sponsorship/ownership	19	5.7
Project management	208	62.5
Project team	26	7.8
Other	16	4.8
Project country	N	%
USA	126	37.8
UK	54	16.2
Brazil	17	5.1
Australia	16	4.8
Germany	15	4.5
Canada	11	3.3
India	8	2.4
Austria	6	1.8
Saudi Arabia	6	1.8
Pakistan	5	1.5
South Africa	5	1.5
Sweden	5	1.5
Argentina	4	1.2
Egypt	4	1.2
Italy	4	1.2
Others (32 countries)	47	14.1

Project Governance (EPG) based on the principles for the governance of project management developed by APM (2011, pp. 9-10). The principles summarize the governance of the project management function into succinct statements that lend themselves to measurement on a Likert-type scale. They draw upon the key themes of corporate governance and are closely related to two major corporate governance standards: the UK Corporate Governance Code and the Sarbanes-Oxley Act (APM, 2011). Although the principles were originally meant to apply to the entire project management function within an organization, they were adapted to apply to individual projects. Additional items were also identified in accordance with the academic literature (Garland, 2013; Zwikael and Smyrk, 2012, 2015). The initial scale consisted of 20 items.

The content validity of the initial EPG scale was tested in a pilot study based on feedback from 21 experts in project governance, based in a wide range of countries and industries. The respondents' mean experience in being involved in project management was 22.81 years, and being involved specifically in project governance was 14.29 years. Content validity was

tested using Lawshe's Content Validity Ratio (CVR) (Lawshe, 1975). The experts were requested to rate the importance of each item on a scale of "essential", "useful, but not essential", and "not necessary". For each item, a $CVR_{critical}$ value was calculated based on the proportion of experts who indicated that the item was "essential" to EPG. In accordance with the recommendations of Ayre and Scally (2014), only items with a $CVR_{critical}$ threshold value >0.429 were accepted. The final EPG scale consists of 9 items.

The BM scale consists of 12 items and was adopted from Serra and Kunc (2015). Sample items include "*Target outcomes were clearly defined*" and "*The strategic objectives that project outcomes were expected to support the achievement of were clearly defined*". The project success scale consists of 11 items and was based on the triple-test performance framework developed by (Zwikael and Smyrk, 2012) as well as the items developed by Serra and Kunc (2015). The scale consists of three dimensions: project management success (5 items), project ownership success (3 items), and project investment success (3 items). Sample items for the three dimensions respectively include "*The project satisfactorily delivered the required outputs*", "*The project's outcomes adhered to the outcomes planned in the business case*", and "*The project has provided the expected return on investment*".

All survey items are listed in Appendix A. This includes the $CVR_{critical}$ values for the EPG scale as well as the mapping of the EPG items to APM's governance of project management principles. All items in all scales were measured on a five-point Likert scale, from 1 (strongly disagree) to 5 (strongly agree). Likert-type scales are effective for subjective questions that aim to measure subjective states, such as opinions, knowledge, feelings, and perceptions (Iarossi, 2006). Since the main variables of interest in this study involve respondents' perceptions, the chosen scale is suitable for this study. Additionally, all items in the online survey were marked as compulsory to avoid cases of missing data.

3.3. Data analysis

Data were analyzed using SPSS 20 and AMOS 21 software. First, the reliability and validity of the data were tested using Cronbach's alpha and factor analyses respectively. Second, a correlation analysis was conducted for the first-order constructs using Pearson's correlation matrix. Third, H_1, H_2, and H_{3a} were tested through Structural Equation Modeling (SEM) in AMOS. Four control variables were included in the SEM models: project type, project cost, project country, and role of the respondent. SEM was used for hypothesis testing in this study due to its benefits over the traditional multiple regression approach, such as its ability to address unreliability directly within each construct of the model (Baron and Kenny, 1986). Also, SEM alleviates the strict assumptions of multiple regressions, such as proper specification of the model, linear relationships, and homoscedasticity, which are increasingly not possible or practical in current research (Alavifar et al., 2012).

Fourth, a mediation analysis was conducted to test H_{3b} in AMOS using the bootstrapping method with bias-corrected 95% confidence estimates. 5000 bootstrap resamples were used in accordance with the recommendations of Preacher and

Hayes (2008). Bootstrapping is a non-parametric technique that does not impose assumptions regarding the sample size or the distribution of the data (Preacher and Hayes, 2008), unlike traditional mediation techniques such as the traditional approach (Baron and Kenny, 1986) and the Sobel Test (Sobel, 1982). Also, bootstrapping offers higher statistical power than the Sobel Test while maintaining reasonable control over Type I error rates (Preacher and Hayes, 2008; Rungtusanatham et al., 2014) and is considered a preferred method for detecting indirect effects (Malhotra et al., 2014).

3.4. Validity and reliability analyses

An Exploratory Factor Analysis (EFA) was conducted specifically for the newly developed EPG scale to identify the latent factors of the construct. The EFA was conducted using Principal Components Analysis and Promax rotation with Kaiser Normalization. The Kaiser-Meyer-Olkin (KMO) test and Barlett's test of sphericity for the EPG scale indicated results (0.905, *p*-value < 0.001) well above the recommended threshold of 0.6 (Kaiser, 1974) and *p*-value < 0.05. This suggests that the data are suitable for structure detection. A cut-off point of 0.35 was used for the EFA factor loadings based on the recommendations of Hair et al. (2010). None of the items loaded below this threshold. The EFA produced a single factor model for EPG, which is presented in Appendix A.

Subsequently, a Confirmatory Factor Analysis (CFA) was conducted to test the convergent and discriminant validities of all the constructs in the model. The results are presented in Appendix A. All items loaded onto their respective constructs with loading values greater than the acceptable threshold of 0.50. Also, for the EPG scale, the CFA results corroborate the EFA

results. Altogether, the results provide evidence for the convergent, discriminant, and, consequently, construct validities of the constructs. Furthermore, all constructs had Cronbach's alpha values above the recommended threshold of 0.7 (Nunnaly, 1978), thus providing evidence for the reliability of the constructs.

The parsimonious fit of the SEM models was tested using the Chi-square/degrees of freedom (χ^2/df) values, all of which were below the acceptable threshold of 5 (Wheaton, 1977) and all but one were below the recommended threshold of 3. The absolute fit of the models was tested using the Root Mean Square Error of Approximation (RMSEA) values. All but one of the RMSEA values were under the recommended maximum threshold of 0.08 (Browne et al., 1993). Finally, the incremental fit of the models was tested using the Comparative Fit Index (CFI). All CFI values were well above the recommended threshold of 0.90 (Byrne, 2013; Hu and Bentler, 1999). The model fit indices are summarized in Fig. 2.

4. Results

4.1. Correlation analysis

Our correlation analysis (Table 2) suggests that all variables indicated a strong positive relationship with each other. This lends support to the causal relationships proposed in our hypotheses and, consequently, to the SEM analyses presented in the next section.

4.2. Structural equation model analyses

The results of the SEM analysis are summarized in Fig. 2. Model 1 tests the direct effect of EPG on BM. Models 2 and 3 test the individual effects of EPG and BM on PS. Models 4 tests
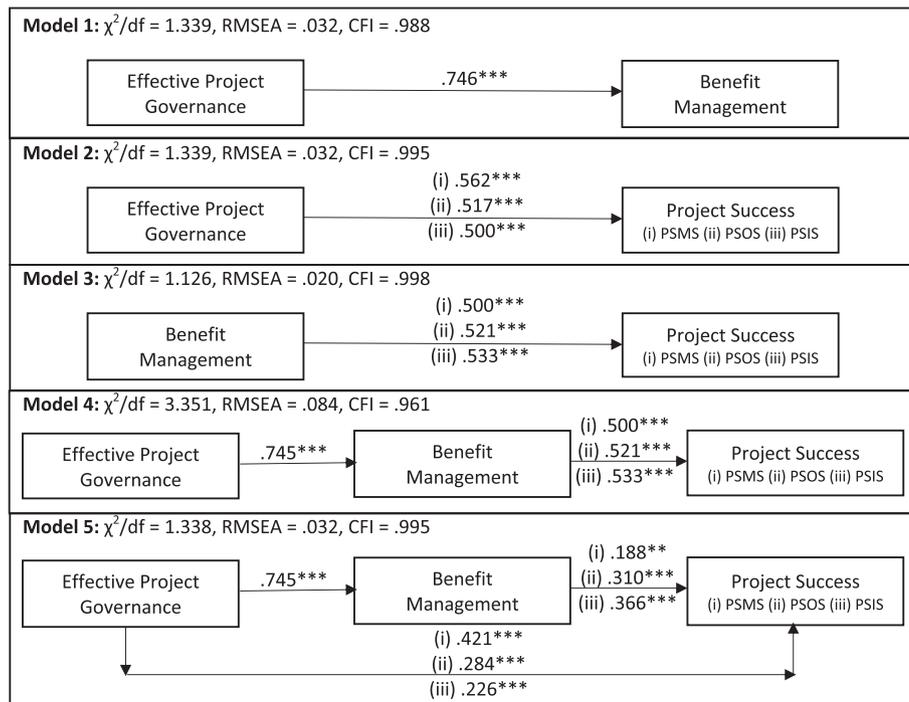

Fig. 2. Structural equation models **$p < 0.01$, ***$p < 0.001$.

Table 2
Correlation analysis.

Construct	Mean	S.D.	EPG	BM	PSMS	PSOS	PSIS
Effective project governance (EPG)	3.76	0.86	(0.893)				
Benefit management (BM)	3.50	0.80	0.745**	(0.901)			
Project management success (PSMS)	3.89	0.82	0.564**	0.500**	(0.851)		
Project ownership success (PSOS)	4.02	0.89	0.516**	0.514**	0.677**	(0.897)	
Project investment success (PSIS)	3.88	0.89	0.504**	0.533**	0.654**	0.822**	(0.872)

Values in parentheses represent the Cronbach's alpha scores. S.D – Standard Deviation.
** Correlation is significant at the 0.01 level (2-tailed).

the effects between all three variable simultaneously. Finally, Model 5 uses the bootstrapping mediation analysis method to test the proposed causal relationships summarized in Fig. 1. None of the control variables were found to have a significant effect in any of the models. All estimates are standardized to facilitate comparisons across variables in the model.

The results indicate strong support for H$_1$ and H$_2$. Also, Model 5 was found to have the highest fit with the data (RMSEA = 0.032, CFI = 0.995) and therefore the partial mediation model is accepted as the best-fitting model. This means that in addition to a direct effect of EPG on project success, BM also partially mediates the relationship between EPG and all three dimensions of project success: PSMS, PSOS, and PSIS. The results of the mediation analysis (presented in Table 3) suggest a similar positive and significant effect of EPG and BM on all three project success dimensions.

4.3. Effects of individual effective project governance and benefit management practices on project success

To answer the last research question, we tested the effects of individual EPG and BM practices on project success. Three separate models were processed in AMOS to analyze the effects of both sets of practices together on the three dimensions of project success: PSMS, PSOS, and PSIS. In all three models, the same four control variables were applied as the SEM analyses. The results are presented in Table 4 and the practice codes are elaborated in Appendix A.

5. Discussion

The results indicate that Effective Project Governance (EPG) has a significant positive effect on Benefit Management (BM), which lends empirical support to the views of various studies that have suggested that EPG supports the effective implementation of BM practices (Jenner, 2014; Sankaran et al., 2007; Thorp, 2007). Also, EPG was found to have a significant

Table 3
Mediation analyses.

Path	Total effect	Direct effect	Indirect effect	Result
EPG ➔ BM ➔ PSMS	0.561***	0.421***	0.140**	Partial mediation
EPG ➔ BM ➔ PSOS	0.516***	0.284***	0.231***	Partial mediation
EPG ➔ BM ➔ PSIS	0.499***	0.226**	0.272***	Partial mediation

**p < 0.01, ***p <0.001.

and positive effects on all three dimensions of project success: Project Management Success (PSMS), Project Ownership Success (PSOS), and Project Investment Success (PSIS). The results support the findings of Abednego and Ogunlana (2006) and APM (2015). Interestingly, we find that the direct effect of EPG is much stronger on PSMS than on the other two dimensions, which may suggest that existing project governance arrangements still emphasize the traditional criteria of time, cost, and scope/quality.

The results further indicate that BM also has strong and significant positive effects on PSMS, PSOS and PSIS, which corroborates the findings of Serra and Kunc (2015) and Badewi (2015). Furthermore, the results empirically support and contribute to the growing discussion that effective BM is necessary to track and realize the return of investments from projects (KPMG, 2010; PMI, 2016a, 2016d).

5.1. The mediating role of benefit management between effective project governance and project success

The overarching thesis of this paper is that EPG enables and supports the implementation of BM practices which, in

Table 4
Effects of individual effective project governance and benefit management practices on project success.

Practice code	PSMS	PSOS	PSIS
EPG1	0.011	−0.003	0.015
EPG2	0.185***	0.132**	0.124**
EPG3	−0.043	−0.079	−0.090*
EPG4	0.193***	0.209***	0.161***
EPG5	0.034	0.036	−0.020
EPG6	0.052	−0.012	−0.008
EPG7	0.059	0.111*	0.117**
EPG8	0.040	−0.006	−0.025
EPG9	0.088	0.028	0.076
BM1	−0.020	0.079	0.048
BM2	0.011	0.083	0.146***
BM3	0.043	0.060	−0.078
BM4	−0.060	−0.088*	−0.023
BM5	−0.072	−0.032	−0.010
BM6	−0.054	−0.014	−0.077
BM7	0.306***	0.443***	0.456***
BM8	0.188***	0.052	0.093*
BM9	0.003	−0.006	0.040
BM10	−0.036	−0.092*	−0.004
BM11	−0.035	−0.048	−0.141**
BM12	0.028	0.043	0.093*

*p < 0.05, **p < 0.01, ***p <0.001.

turn, ensure that projects realize their business cases in an efficient and effective manner. The results lend support to this notion. BM was found to partially mediate the relationship between EPG and PS, thus indicating that a strong governance climate would encourage the development and leadership of a BM process in projects. EPG creates the necessary roles and responsibilities (Sapountzis et al., 2009) as well as the system of accountabilities (Ahlemann et al., 2013; Badewi, 2015; Zwikael and Smyrk, 2015) that are necessary for effective BM. Also, EPG plays a vital role in ensuring that benefits are constantly reviewed and aligned with organizational strategic objectives (Hjelmbrekke et al., 2014). Furthermore, the governance framework may provide the much needed senior management support to champion the benefits-oriented view of projects (Paivarinta et al., 2007; Thorp, 2007), as opposed to the harmful short-termism of an excessive emphasis on project delivery within time, cost, and scope/quality constraints.

A possible reason for the strong positive results might be the fact that nearly three-quarters of the respondents possessed a PMP qualification. This may indicate a level of familiarity with the professional body of knowledge pertaining to EPG and BM practices that may not be representative of the average project manager. Therefore, the qualifications of the respondents should be taken into consideration when interpreting the results.

It may be argued that the direction of causality between EPG and BM is not immediately clear. Benefits realization is recognized as one of the integral themes of EPG (APM, 2011; PMI, 2016b; Sargeant et al., 2010), which suggests that organizations with strong project governance should be managing project benefits more actively and effectively. At the same time, EPG is recognized as a vital component of a larger BM approach (Bradley, 2010; Jenner, 2014; Thorp, 2007), which suggests that organizations with mature BM processes should have stronger project governance. However, we argue that while EPG is a vital component of a larger benefits realization *approach*, it is very much the driver of the BM *process* itself. It is the latter that is the focus of this study. Hence, we conclude that EPG enables BM practices, which in turn improves project success. This view is supported by the categorization of BM as a key responsibility of the governance framework under leading industry standards such as PRINCE2 (Office of Government Commerce, 2009), MSP (Office of Government Commerce, 2007), IPMA's Individual Competence Baseline (International Project Management Association, 2015), and APM's Governance of Project Management guidelines (APM, 2011).

However, it should be noted that this may not always be the case. For example, a strong project governance system that emphasizes and enforces the incomplete project success criteria of time, cost, and scope/quality would not necessarily stimulate the development of a BM process and, in fact, may actually be detrimental to such a process (Thorp, 2007). Therefore, while we maintain that EPG enables BM, we also suggest that a benefits mindset should be adopted by project governors and benefits accountabilities should be embedded into the project governance framework. Additionally, while active BM at the

project level is important, benefits are often realized through a combination of outputs and outcomes from an interdependent portfolio of projects (Doherty et al., 2012). Hence, the BM process at the individual project level should be part of a larger, organization-wide benefits realization approach. This would ensure that project benefits are actively tracked and reviewed throughout the project life cycle, and that there is a smooth handover of remaining benefits to the program, corporate, or line management upon project delivery (Office of Government Commerce, 2009).

To summarize, an integrated framework of BM practices supported by strong governance helps to ensure that project investments create the required value and support organizational strategic objectives (Breese, 2012; Serra and Kunc, 2015). This framework should be guided by a benefits-oriented mindset championed by the project governors and senior management. Indeed, the findings of Ward et al. (2007) indicate that successful organizations are more likely to have a comprehensive benefits orientation. Thus, such a framework might not only serve to enhance project success but also overall organizational performance (Chih and Zwikael, 2015).

5.2. Relative importance of effective project governance and benefit management practices

A secondary objective of this paper was to identify the EPG and BM practices have the greatest impact on project success. A focus on the most critical practices will support decision making and resource allocation in organizations. The results of the analyses are presented in Table 4.

For EPG, the strongest positive effect overall on all dimensions of project success was observed for item PG4: "*The project's business case was supported by relevant and realistic information that provided a reliable basis for making authorization decisions*". The results support the view of Too and Weaver (2014) that information is the primary output from project management to the governance system. The lack of relevant and realistic information, especially at the initiation stage, can have a detrimental impact on project success (Abednego and Ogunlana, 2006). Adequate information feedback is also necessary during the other stages in project life cycle to enable decision-makers to adjust the course of the project to ensure project success (PMI, 2013).

The second strongest EPG effect on project success was of PG2: "*Disciplined governance arrangements were applied throughout the project life cycle*". This seems to suggest that the type of governance approach used may be less important than the consistency with which it is implemented throughout the project. This is emphasized by Thorp (2007) in the concept of 'full cycle governance' that advocates a consistent and long-term oriented governance approach from project concept to cash. The lack of a disciplined governance approach can be detrimental to project success. For example, Pinto (2014) uses the case study of NASA's Challenger spaceship to warn of the dangers of the 'normalization of deviance' in projects, which emerges due to a lack of disciplined governance.

Furthermore, a significant positive effect on project success was found for PG7: "*The project had a project owner who was the single point of accountability in and to the organization for realizing project outcomes and benefits*". The project owner is a critical governance role for ensuring that projects achieve their required outcomes and benefits (Badewi, 2015; Zwikael and Smyrk, 2015) and, consequently, their broader investment objectives (Garland, 2013). Furthermore, the lack of project ownership is a commonly cited reason for project failure (Garland, 2013).

Among the BM practices, the strongest positive effect on all three dimensions of project success, by far, was observed for BM7: "*Actual project outcomes adhered to the target outcomes planned in the business case*". This item refers to the continuous process of reviewing and realigning the expected outcomes and benefits with the business' needs (Serra, 2013). These needs are reflected in the target outcomes specified in the project's business case, which itself needs to be constantly reassessed and updated in light of the changing business environment. Hence, the adherence of actual outcomes with target outcomes indicates the existence of an effective process of benefits review, update, and realignment (Serra, 2013). Our results corroborate the findings of Serra and Kunc (2015), who also found this practice to be the strongest predictor of project success. The findings also lend strong support to the crux of the BM approach, which is to ensure that projects achieve their target outcomes that would, in turn, deliver target benefits (Bradley, 2010). Additionally, the findings emphasizes the need for high-quality business cases to set project goals (Ward et al., 2008) and the continuous alignment of target benefits specified in the business case with organizational strategic objectives as important antecedents for project success (PMI, 2016d).

The second strongest effect on project success overall was observed for BM8: "*Activities aiming to ensure the integration of project outputs to the regular business routine* (*training, support, monitoring, and outcomes evaluation*) *were executed as part of the project's scope*". This emphasizes the need for projects to develop benefits maps or dependency networks to track the relationships between project outputs, outcomes, and benefits. These maps allow organizations to track the required enabling business changes for benefits realization (BIS, 2010) as well as the potential facilitators and inhibitors of such changes (Coombs, 2015). The active management of these changes, facilitators, and inhibitors is essential for ensuring that projects deliver their required investment objectives (Coombs, 2015).

Also, a notably strong positive effect on the PSIS dimension was observed for BM2: "*The value created to the organization by project outcomes was clearly measurable*". The measurement of benefits is critical for ensuring that project investments achieve their objectives and support organizational strategy (PMI, 2016a). However, measuring project outcomes and benefits is a complex process as it requires proof of correlation to, and causality from, the respective project outputs (Jenner, 2010). The complexity of measurement is compounded further in the case of non-financial or intangible benefits, such as customer

satisfaction (PMI, 2016a). To overcome these challenges, organizations should implement disciplined benefits reporting processes complemented by standardized reporting documentation (PMI, 2016a).

6. Conclusion

The purpose of this study was to develop the foundations of a framework for supporting organizational strategy implementation through realizing project benefits. To this end, we investigated the interrelationships between the key concepts of project governance, benefit management, and project success. The analysis was based on scale development validated by 21 project governance experts, as well as an international survey of 333 projects from 47 countries and 32 industries. This study developed an operationalizing model for the construct of effective project governance, and subsequently developed and tested a theory for the mechanism by which effective project governance enhances project success as discussed below.

With respect to the first research question, we find that effective project governance is an important catalyst for the development and leadership of a benefit management process in projects. At the same time, we recognize that the interaction between these two concepts is more complex than a simple cause-and-effect relationship. Project governance creates the roles, responsibilities, and accountabilities that enable benefit management. Yet, project governance itself can only be effective in improving project success and supporting organizational strategy if key governance roles, such as the project owner, adopt a benefits realization mindset and embed this mindset into the project management system. This would entail advocating a consistent, benefits-oriented approach from project conception to the point when benefits are realized (Thorp, 2007).

With respect to the second research question, we find strong evidence that both effective project governance and benefit management have positive effects on all three dimensions of project success: project management success, project ownership success, and project investment success (Zwikael and Smyrk, 2012). Additionally, we find that the positive impact of effective project governance on project success is partially mediated by benefit management. This indicates that enabling benefit management is a key mechanism through which effective project governance improves project success.

With respect to the third research question, we find that, for effective project governance, the availability of relevant and realistic information for making authorization decisions in the business case (e.g. target benefits) is the strongest predictor of project success overall. The second strongest predictor is the application of disciplined governance arrangements throughout the project life cycle. Additionally, the existence of the project owner role as the single point of accountability in the organization is a strong predictor of project success. For benefit management, the strongest predictor of project success is the process of continuous review and realignment of actual project outcomes with target outcomes. The second strongest predictor is ensuring that project outputs are integrated into the regular

business routine. Furthermore, ensuring that the value of project outcomes is clearly measurable is a strong predictor of project investment success.

6.1. Theoretical contributions

This main theoretical contribution of this study is the development of a mediation model that identifies benefit management as one of the processes through which effective project governance improves project success. The model sets the foundations for a theory that explains how project governance enhances project success and enables the realization of organizational strategic objectives through projects.

Additionally, this study contributes to the growing body of literature that finds the traditional triple constraint criteria of project success to be incomplete (Andersen, 2014; Atkinson, 1999; Baccarini, 1999) by expanding these criteria to include the realization of the project business case and project investment objectives.

Finally, this study develops and validates a scale for effective project governance construct consisting of nine key governance practices, which addresses the lack of an operationalization of project governance in the literature (Pitsis et al., 2014). The findings indicate that this scale is both a valid and reliable measure of the strength of an organization's project governance function. It is hoped that this will stimulate further empirical research in project governance in future.

6.2. Practical implications

The main practical implication of this study is that organizations need to recognize that the ultimate aim of projects is to realize benefits (Cooke-Davies, 2002; Jenner, 2014; Thorp, 2007). Project governors should champion this benefits-oriented view and embed the accountabilities for benefits realization in the project governance system, thereby enabling the development and implementation of a comprehensive benefit management process. Overall, this integrated approach would support the implementation of organizational strategy through projects. This study contributes to a growing body of evidence, which argues that a shift towards a benefits mindset is necessary in order for organizations to maximize their returns from project investments (KPMG, 2010; PMI, 2016d; Ward et al., 2007).

6.3. Limitations and future research directions

A limitation of this study stems from the use of a quantitative research design, which restricts its ability to comment on the complex relationships between the concepts under study. Future research may apply a qualitative design to explore in greater detail how effective project governance impacts benefit management and vice versa, as well as how both these concepts impact project success.

Also, due to practical constraints pertaining to the sampling and data collection strategy, the study sample may not consist entirely of unique and discrete organizations. However, given that the sample consists of responses from 47 countries and 32 industries, it is unlikely that there would be multiple projects from the same organization.

Additionally, due to the cross-sectional time horizon of this study, the actual realization of benefits was not directly measured. Future studies may take a longitudinal approach to assess the extent to which effective project governance and benefit management practices enable the actual realization of benefits, as well as the extent to which these benefits contribute to organizational performance.

Furthermore, to mitigate the loss of detail, respondents were asked to report on a project completed not more than two years ago. However, this instruction can potentially present a selection bias in the data towards more recent projects.

Finally, this study developed and validated a scale for effective project governance. Future studies may apply this scale in different contexts and with different models to advance empirical research on project governance.

Conflict of interest

The authors declare that there is no conflict of interest.

Appendix A. List of coded survey items

Code	Item statement	APM (2011) Principle	CVR$_{critical}$ value	EFA load Factor 1	CFA load
Effective project governance					
PG1	The management board had overall responsibility for project governance	No. 01	0.714	0.575	0.513
PG2	Disciplined governance arrangements were applied throughout the project life cycle	No. 04	0.524	0.837	0.817
PG3	Roles and responsibilities for project governance were defined clearly	No. 03	0.810	0.821	0.807
PG4	The project's business case was supported by relevant and realistic information that provided a reliable basis for making authorization decisions	No. 08	0.524	0.682	0.665

Appendix A (*continued*)

Code	Item statement	APM (2011) Principle	CVR$_{critical}$ value	EFA load Factor 1	CFA load
PG5	There were clearly defined criteria for reporting project status and for the escalation of risks and issues to the relevant organizational levels	No. 10	0.905	0.772	0.724
PG6	Decisions made at authorization points were recorded and communicated to the relevant stakeholders	No. 06	0.619	0.799	0.779
PG7	The project had a project owner who was the single point of accountability in and to the organization for realizing project outcomes and benefits	No. 04	0.810	0.688	0.628
PG8	The project had a project manager who was accountable to the project owner for achieving project objectives and deliverables	No. 04	0.810	0.703	0.626
PG9	The organization fostered a culture of frank internal disclosure of project management information	No. 11	0.714	0.735	0.709

Code	Item statement	CFA load
Benefit management		
BM1	Target outcomes were clearly defined	0.652
BM2	The value created to the organization by project outcomes was clearly measurable	0.595
BM3	The strategic objectives that project outcomes were expected to support the achievement of were clearly defined	0.669
BM4	A business case was approved at the beginning of the project, describing all outputs, outcomes and benefits that were expected from the project	0.586
BM5	Project outputs and outcomes were frequently reviewed to ensure their alignment with expectations	0.686
BM6	Stakeholders were aware of the results of project reviews and their needs were frequently assessed with a view to make changes	0.713
BM7	Actual project outcomes adhered to the target outcomes planned in the business case	0.700
BM8	Activities aiming to ensure the integration of project outputs into the regular business routine (training, support, monitoring, and outcomes evaluation) were executed as part of the project's scope	0.633
BM9	After project closure, the organization kept monitoring project outcomes in order to ensure the achievement of all benefits expected in the business case	0.594
BM10	From the first delivery to the project's closure, the organization performed a pre-planned, regular process to ensure the integration of project outputs into the regular business routine (including outcomes evaluation)	0.738
BM11	A project benefit management strategy is applied throughout the company	0.627
BM12	A project benefit management strategy was applied for the project under analysis	0.706
Project success – project management success		
PSMS1	The project satisfactorily met the budget goals	0.762
PSMS2	The project satisfactorily met the schedule goals	0.747
PSMS3	The project satisfactorily delivered the required outputs	0.725
PSMS4	Undesired outcomes were managed and avoided	0.668
PSMS5	The project was successful in achieving the project plan	0.763
Project success – project ownership success		
PSOS1	The project's outputs have supported the business to produce the target outcomes	0.850
PSOS2	The project's outcomes adhered to the outcomes planned in the business case	0.862
PSOS3	The project was successful in realizing the business case	0.878
Project success – project investment success		
PSIS1	The project's outcomes supported the achievement of overall project objectives	0.863
PSIS2	The project has provided the expected return on investment	0.788
PSIS3	The project was successful in realizing its investment objectives	0.819

References

Abednego, M.P., Ogunlana, S.O., 2006. Good project governance for proper risk allocation in public–private partnerships in Indonesia. Int. J. Proj. Manag. 24 (7), 622–634.

Ahlemann, F., Hesselmann, F., Braun, J., Mohan, K., 2013. Exploiting Is/it projects' potential-towards a design theory for benefits management. Paper Presented at the 21th European Conference on Information Systems (ECIS 2013), Utrecht, Netherlands.

Ahola, T., Ruuska, I., Artto, K., Kujala, J., 2014. What is project governance and what are its origins? Int. J. Proj. Manag. 32 (8), 1321–1332.

Alavifar, A., Karimimalayer, M., Anuar, M., 2012. Structural equation modeling VS multiple regression. IRACST Eng. Sci. Technol. 2, 326–329.

Andersen, E.S., 2014. Value creation using the mission breakdown structure. Int. J. Proj. Manag. 32 (5), 885–892.

APM, 2009. Change for the Better. A Study on Benefits Management Across the UK. Association for Project Management.

APM, 2011. Directing Change: A Guide to Governance of Project Management. 2nd ed. Association for Project Management.

APM, 2012. APM Body of Knowledge. 6th ed. Association for Project Management.

APM, 2015. Conditions for Project Success: APM Research Report. Association for Project Management.

Armstrong, J.S., Overton, T.S., 1977. Estimating nonresponse bias in mail surveys. J. Mark. Res. 396–402.

Ashurst, C., Doherty, N.F., Peppard, J., 2008. Improving the impact of IT development projects: the benefits realization capability model. Eur. J. Inf. Syst. 17 (4), 352–370.

Atif, A., Richards, D., Bilgin, A., 2012. Estimating non-response bias in a web-based survey of technology acceptance: a case study of unit guide information systems. Paper Presented at the 23rd Australasian Conference on Information Systems, 3–5 Dec 2012, Geelong.

Atkinson, R., 1999. Project management: cost, time and quality, two best guesses and a phenomenon, its time to accept other success criteria. Int. J. Proj. Manag. 17 (6), 337–342.

Ayre, C., Scally, A.J., 2014. Critical values for Lawshe's content validity ratio revisiting the original methods of calculation. Meas. Eval. Couns. Dev. 47 (1), 79–86.

Baccarini, D., 1999. The logical framework method for defining project success. Proj. Manag. J. 30 (4), 25–32.

Badewi, A., 2015. The impact of project management (PM) and benefits management (BM) practices on project success: towards developing a project benefits governance framework. Int. J. Proj. Manag. 34 (4), 761–778.

Baron, R.M., Kenny, D.A., 1986. The moderator–mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. J. Pers. Soc. Psychol. 51 (6), 1173.

Bekker, M.C., 2015. Project governance—the definition and leadership dilemma. Procedia Soc. Behav. Sci. 194, 33–43.

Bekker, M.C., Steyn, H., 2009. Project governance: definition and framework. J. Contemp. Manag. 6, 214–228.

Bernroider, E.W., Wong, C.W., Lai, K.H., 2014. From dynamic capabilities to ERP enabled business improvements: the mediating effect of the implementation project. Int. J. Proj. Manag. 32 (2), 350–362.

Biesenthal, C., Wilden, R., 2014. Multi-level project governance: trends and opportunities. Int. J. Proj. Manag. 32 (8), 1291–1308.

BIS, 2010. Guidelines for managing programmes: understanding programmes and programme management: department for business. Innov. Skills (BIS).

Bowen, P.L., Cheung, M.Y.D., Rohde, F.H., 2007. Enhancing IT governance practices: a model and case study of an organization's efforts. Int. J. Account. Inf. Syst. 8 (3), 191–221.

Bradley, G., 2010. Benefit Realisation Management: A Practical Guide to Achieving Benefits Through Change. Gower Publishing, Ltd.

Breese, R., 2012. Benefits realisation management: panacea or false dawn? Int. J. Proj. Manag. 30 (3), 341–351.

Breese, R., Jenner, S., Serra, C.E.M., Thorp, J., 2015. Benefits management: lost or found in translation. Int. J. Proj. Manag. 33 (7), 1438–1451.

Browne, M.W., Cudeck, R., Bollen, K.A., Long, J.S., 1993. Alternative Ways of Assessing Model fit. Sage Focus Editions Vol. 154 p. 136.

Brunet, M., Aubry, M., 2016. The three dimensions of a governance framework for major public projects. Int. J. Proj. Manag. 34 (8), 1596–1607.

Byrne, B.M., 2013. Structural Equation Modeling with AMOS: Basic Concepts, Applications, and Programming. Routledge.

Chih, Y.Y., Zwikael, O., 2015. Project benefit management: a conceptual framework of target benefit formulation. Int. J. Proj. Manag. 33 (2), 352–362.

Cooke-Davies, T., 2002. The "real" success factors on projects. Int. J. Proj. Manag. 20 (3), 185–190.

Coombs, C.R., 2015. When planned IS/IT project benefits are not realized: a study of inhibitors and facilitators to benefits realization. Int. J. Proj. Manag. 33 (2), 363–379.

Creswell, J., 2014. Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. 4th ed.

Davis, J.H., Schoorman, F.D., Donaldson, L., 1997. Toward a stewardship theory of management. Acad. Manag. Rev. 22 (1), 20–47.

DiMaggio, P.J., 1988. Interest and Agency in Institutional Theory. Institutional Patterns and Organizations: Culture and Environment Vol. 1 pp. 3–22.

Doherty, N.F., 2014. The role of socio-technical principles in leveraging meaningful benefits from IT investments. Appl. Ergon. 45 (2), 181–187.

Doherty, N.F., Ashurst, C., Peppard, J., 2012. Factors affecting the successful realisation of benefits from systems development projects: findings from three case studies. J. Inf. Technol. 27 (1), 1–16.

Donaldson, T., Preston, L.E., 1995. The stakeholder theory of the corporation: concepts, evidence, and implications. Acad. Manag. Rev. 20 (1), 65–91.

Engwall, M., 2003. No project is an island: linking projects to history and context. Res. Policy 32 (5), 789–808.

Flyvbjerg, B., Bruzelius, N., Rothengatter, W., 2003. Megaprojects and Risk: An Anatomy of Ambition. Cambridge University Press.

Friedman, M., 1962. Capitalism and Freedom. University of Chicago Press, Chicago, IL.

Garland, R., 2009. Project Governance: A Practical Guide to Effective Project Decision Making. Kogan Page Publishers.

Garland, R., 2013. Programme and Project Accountability: The Governance of Capital Investments. The Stationery Office (TSO).

Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E., 2010. Multivariate Data Analysis. 7th ed. Prentice Hall, Upper Saddle River, New Jersey.

Hesselmann, F., Kunal, M., 2014. Where are we headed with benefits management research? Current shortcomings and avenues for future research. Paper Presented at the 22nd European Conference on Information Systems, Tel Aviv.

Hjelmbrekke, H., Lædre, O., Lohne, J., 2014. The need for a project governance body. Int. J. Manag. Proj. Bus. 7 (4), 661–677.

Hoetker, G., Mellewigt, T., 2009. Choice and performance of governance mechanisms: matching alliance governance to asset type. Strateg. Manag. J. 30 (10), 1025–1044.

Hu, L.t., Bentler, P.M., 1999. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. Struct. Equ. Model. Multidiscip. J. 6 (1), 1–55.

Iarossi, G., 2006. The Power of Survey Design: A User's Guide for Managing Surveys, Interpreting Results, and Influencing Respondents. The World Bank, Washington.

Ika, L.A., 2009. Project success as a topic in project management journals. Proj. Manag. J. 40 (4), 6–19.

International Project Management Association, 2015. Individual Competence Baseline for Project, Programme & Portfolio Management. IPMA, Zurich.

IT Governance Institute, 2007. COBIT 4.1. ISACA, USA.

Jenner, S., 2010. Transforming Government and Public Services: Realising Benefits Through Project Portfolio Management. Gower, Farnham.

Jenner, S., 2012. Benefits realization — building on (un) safe foundations or planning for success? PM World J. 1 (1).

Jenner, S., 2014. Managing Benefits. 2nd ed. The Stationery Office (TSO).

Jenner, S., 2015. Why do projects 'fail' and more to the point what can we do about it? The case for disciplined, 'fast and frugal' decision-making. PM World J. 4 (3).

Jones, P., 2006. Ove Arup: Masterbuilder of the Twentieth Century. Yale University Press, New Haven, CT.

Joslin, R., Müller, R., 2015. Relationships between a project management methodology and project success in different project governance contexts. Int. J. Proj. Manag. 33 (6), 1377–1392.

Joslin, R., Müller, R., 2016. The relationship between project governance and project success. Int. J. Proj. Manag. 34 (4), 613–626.

Kaiser, H.F., 1974. An index of factorial simplicity. Psychometrika 39 (1), 31–36.

Keeter, S., Kennedy, C., Dimock, M., Best, J., Craighill, P., 2006. Gauging the impact of growing nonresponse on estimates from a national RDD telephone survey. Public Opin. Q. 70 (5), 759–779.

Kochhar, R., 1996. Explaining firm capital structure: the role of agency theory vs. transaction cost economics. Strateg. Manag. J. 17 (9), 713–728.

KPMG, 2010. KPMG New Zealand Project Management Survey 2010. KPMG.

Lappe, M., Spang, K., 2014. Investments in project management are profitable: a case study-based analysis of the relationship between the costs and benefits of project management. Int. J. Proj. Manag. 32 (4), 603–612.

Lawshe, C.H., 1975. A quantitative approach to content validity1. Pers. Psychol. 28 (4), 563–575.

Levie, F., Burke, C.M., Lannon, J., 2017. Filling the gaps: an investigation of project governance in a non-governmental organisation's response to the Haiti earthquake disaster. Int. J. Proj. Manag. 35 (5), 875–888.

Liu, T., Wang, Y., Wilkinson, S., 2016. Identifying critical factors affecting the effectiveness and efficiency of tendering processes in public–private partnerships (PPPs): a comparative analysis of Australia and China. Int. J. Proj. Manag. 34 (4), 701–716.

Locatelli, G., Mancini, M., Romano, E., 2014. Systems engineering to improve the governance in complex project environments. Int. J. Proj. Manag. 32 (8), 1395–1410.

Lu, P., Guo, S., Qian, L., He, P., Xu, X., 2015. The effectiveness of contractual and relational governances in construction projects in China. Int. J. Proj. Manag. 33 (1), 212–222.

Malhotra, M.K., Singhal, C., Shang, G., Ployhart, R.E., 2014. A critical evaluation of alternative methods and paradigms for conducting mediation analysis in operations management research. J. Oper. Manag. 32 (4), 127–137.

Meyer, J.W., Rowan, B., 1977. Institutionalized organizations: formal structure as myth and ceremony. Am. J. Sociol. 340–363.

Mir, F.A., Pinnington, A.H., 2014. Exploring the value of project management: linking project management performance and project success. Int. J. Proj. Manag. 32 (2), 202–217.

Morris, P., 2004. The Irrelevance of Project Management as a Professional Discipline. INDECO Management Solutions.

Müller, R., 2009. Project Governance. Gower Publishing, Ltd.

Müller, R., Pemsel, S., Shao, J., 2015. Organizational enablers for project governance and governmentality in project-based organizations. Int. J. Proj. Manag. 33 (4), 839–851.

NSW Office of Finance & Services, 2015. Benefits realization management framework. Available at: http://www.finance.nsw.gov.au/publication-and-resources/benefits-realisation-management-framework.

Nunnaly, J.C., 1978. Psychometric Theory. 2nd ed. McGraw-Hill, New York, USA.

Office of Government Commerce, 2007. Managing Successful Programmes (MSP). The Stationery Office (TSO), London.

Office of Government Commerce, 2009. Managing Successful Projects with PRINCE2. The Stationery Office (TSO).

Paivarinta, T., Dertz, W., Flak, L.S., 2007. Issues of adopting benefits management practices of IT investments in municipalities: a Delphi study in Norway. Paper Presented at the 40th Annual Hawaii International Conference on System Sciences (HICSS) 2007. IEEE, p. 103.

Patanakul, P., 2014. Managing large-scale IS/IT projects in the public sector: problems and causes leading to poor performance. J. High Technol. Manag. Res. 25 (1), 21–35.

Pinto, J.K., 2014. Project management, governance, and the normalization of deviance. Int. J. Proj. Manag. 32 (3), 376–387.

Pitsis, T.S., Sankaran, S., Gudergan, S., Clegg, S.R., 2014. Governing projects under complexity: theory and practice in project management. Int. J. Proj. Manag. 32 (8), 1285–1290.

PMI, 2013. PMI's Pulse of the Profession in-Depth Report: The Impact of PMOs on Strategy Implementation. Project Management Insitute.

PMI, 2014. Pulse of the Profession 2014: The High Cost of low Performance. Project Management Institute.

PMI, 2015. Pulse of the Profession 2015: Capturing the Value of Project Management 2015. Project Management Institute.

PMI, 2016a. Delivering Value: Focus on Benefits During Project Execution. Project Management Institute.

PMI, 2016b. Governance of Portfolios, Programs, and Projects: A Practice Guide. Project Management Institute, Newtown Square, PA, USA.

PMI, 2016c. Pulse of the Profession 2016: The High Cost of low Performance. Project Management Institute.

PMI, 2016d. The Strategic Impact of Projects: Identify Benefits to Drive Business Results. Project Management Institute.

Preacher, K.J., Hayes, A.F., 2008. Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. Behav. Res. Methods 40 (3), 879–891.

Roe, P., 2015. The Factors Which Contribute to Successful Projects. Bostock Marketing Group Ltd, p. 2015.

Ross, S.A., 1973. The economic theory of agency: the principal's problem. Am. Econ. Rev. 63 (2), 134–139.

Rungtusanatham, M., Miller, J., Boyer, K., 2014. Theorizing, testing, and concluding for mediation in SCM research: tutorial and procedural recommendations. J. Oper. Manag. 32 (3), 99–113.

Samset, K., Volden, G.H., 2016. Front-end definition of projects: ten paradoxes and some reflections regarding project management and project governance. Int. J. Proj. Manag. 34 (2), 297–313.

Sankaran, S., Remington, K., Turner, C., 2007. Relationship between project governance and project performance: a multiple case study of shutdown maintenance projects in a maritime environment. Paper Presented at the Asia-Pacific PMI Global Congress Proceedings, Sydney, Australia.

Sapountzis, S., Yates, K., Kagioglou, M., Aouad, G., 2009. Realising benefits in primary healthcare infrastructures. Facilities 27 (3/4), 74–87.

Sargeant, R., Hatcher, C., Trigunarsyah, B., Coffey, V., Kraatz, J.A., 2010. Creating Value in Project Management Using PRINCE2. Office of Government Commerce (OGC), London, UK.

Saunders, M., Lewis, P., Thornhill, A., 2009. Research Methods for Business Students. Prentice Hall, Harlow.

Serra, C.E.M., 2013. The Influence of Benefits Realisation Management on the Success of Projects in Brazil, the United Kingdom and the United States of America. The University of Warwick.

Serra, C.E.M., Kunc, M., 2015. Benefits realisation management and its influence on project success and on the execution of business strategies. Int. J. Proj. Manag. 33 (1), 53–66.

Shenhar, A.J., Dvir, D., 2007. Reinventing Project Management: The Diamond Approach to Successful Growth and Innovation. Harvard Business School Press.

Sobel, M.E., 1982. Asymptotic confidence intervals for indirect effects in structural equation models. Sociol. Methodol. 13 (1982), 290–312.

Standish Group, 2015. The CHAOS Report.

Teddlie, C., Tashakkori, A., 2009. Foundations of Mixed Methods Research: Integrating Quantitative and Qualitative Approaches in the Social and Behavioral Sciences. Sage Publications Inc.

Thorp, J., 2001. A benefits realization approach to IT investments. Information Systems Evaluation Management, pp. 75–96.

Thorp, J., 2007. The Information Paradox: Realizing the Business Benefits of Information Technology. Revised ed. Fujitsu Consulting (Canada) Inc.

Too, E.G., Weaver, P., 2014. The management of project management: a conceptual framework for project governance. Int. J. Proj. Manag. 32 (8), 1382–1394.

Turner, R.J., Huemann, M., Anbari, F.T., Bredillet, C.N., 2010. Perspectives on Projects. Routledge.

Van Marrewijk, A., Clegg, S.R., Pitsis, T.S., Veenswijk, M., 2008. Managing public–private megaprojects: paradoxes, complexity, and project design. Int. J. Proj. Manag. 26 (6), 591–600.

Visser, P.S., Krosnick, J.A., Marquette, J., Curtin, M., 1996. Mail surveys for election forecasting? An evaluation of the Columbus dispatch poll. Public Opin. Q. 60 (2), 181–227.

Ward, J., Daniel, E., 2013. The role of project management offices (PMOs) in IS project success and management satisfaction. J. Enterp. Inf. Manag. 26 (3), 316–336.

Ward, J., De Hertogh, S., Viaene, S., 2007. Managing Benefits from IS/IT Investments: An Empirical Investigation into Current Practice. Paper Presented at the 40th Annual Hawaii International Conference on System Sciences, 2007, p. 206a.

Ward, J., Daniel, E., Peppard, J., 2008. Building better business cases for IT investments. MIS Q. Exec. 7 (1).

Wheaton, D.E., 1977. Assessing reliability and stability in panel models. Sociol. Methodol. 8, 84–136.

Williamson, O.E., 1979. Transaction-cost economics: the governance of contractual relations. J. Law Econ. 22 (2), 233–261.

Winter, M., Smith, C., Morris, P., Cicmil, S., 2006. Directions for future research in project management: the main findings of a UK government-funded research network. Int. J. Proj. Manag. 24 (8), 638–649.

Zwikael, O., 2016. Editorial — international journal of project management special issue on project benefit management. Int. J. Proj. Manag. 34 (4), 734–735.

Zwikael, O., Smyrk, J., 2012. A general framework for gauging the performance of initiatives to enhance organizational value. Br. J. Manag. 23 (S1), S6–S22.

Zwikael, O., Smyrk, J., 2015. Project governance: balancing control and trust in dealing with risk. Int. J. Proj. Manag. 33 (4), 852–862.