Governance of Interorganizational Project Networks

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1. Introduction

We would like to thank the Sponsored Research Program (SRP) of the Project Management Institute (PMI) for sponsoring this research on the governance of interorganizational project networks. Their support was paramount for the realization of this project, which will contribute to future developments and directions in the field of project management. It was a real pleasure to collaborate with Professor Darren Dalcher, PMI liaison for this research project, as well as with the other PMI SRP members who contributed to building and maintaining an open working relationship with our research team in terms of trust, communication, and partnership. Moreover, we are grateful for the support received from the organizations that participated in the project.

This final report presents the findings that were developed by our international team, led by the principal investigator Professor Ralf Müller (BI Norwegian Business School). Co-investigators include renowned researchers from Australia, Canada, China, Iceland, Lithuania, Norway, and the United Kingdom.

Interorganizational networks for joint projects are becoming prevalent in project execution, especially in large and complex projects (Adami & Verschoore, 2018). They are defined by "a series of projects that are interconnected by interorganizational relationships that enable and constrain the management of projects" (DeFillippi & Sydow, 2016, p.6). Hence, these networks are a significant factor influencing the results and performance levels of the projects and the organizations executing them. Moreover, the governance of these interorganizational networks has been shown to hold significant importance for organizational success (Joslin & Müller, 2016; Young et al., 2020). Past studies on the governance of project-related networks largely adopt a project-centric perspective (e.g., Hellgren & Stjernberg, 1995), while few studies have addressed the governance of these networks per se, that is, across many projects and/or over time, including the associated dynamics in governance approaches. Consequently, this project broadens the perspectives of earlier studies by proposing a shift from project focus to network focus and by including two additional dimensions to the study of network governance, that of best-fit and that of time. This integrated approach is better aligned with experienced reality and develops a framework of interorganizational network practices and theories, their contextual contingencies, and their relative impact on the performance of the network. Hence, it shows which governance approach is likely to yield the highest network performance in a given context.

This final report is divided into sections, each corresponding to a key aspect or stage of the research project. Section 2 presents the research questions and objectives; Section 3 summarizes the literature reviewed and describes the conceptual framework developed to carry out this research; Section 4 explains the methods used; Section 5 summarizes and discusses the results of the study; Section 6 presents some practical applications of the findings; and Section 7 offers a summary and concluding comments of the research project.

2. Research Questions and Objectives

This project suggests a shift in perspective in the study of interorganizational networks from the temporary organization, that is, a project, to a semipermanent network of organizations and their joint projects (Sydow & Braun, 2018). This shift is necessary to develop a reliable framework for predicting network performance and project/organizational results. As part of this research, we addressed this shortcoming by asking three research questions (RQs).

First, we explore how interorganizational networks are currently governed. So we ask:

RQ1: How are longer-term interorganizational networks formed and governed for joint large and megaprojects?

As governance approaches are idiosyncratic for organizations (Simard et al., 2018), it is necessary to identify the contextual contingencies of the different network governance approaches for interorganizational networks for joint projects. To that end, we ask:

RQ2: Which theories, structural designs, and governance practices are used in different contexts?

Finally, to fine-tune network governance for the best possible network performance, it is necessary to investigate the strength of the impact of different governance approaches on network performance and the quantification thereof. For that, we ask:

RQ3: What are the implications of different network governance approaches for project and network governance performance? In other words, how does interorganizational governance influence project success?

The objectives of the study are to:

- Identify the variety of network designs and their governance approaches for long-term interorganizational networks established for multiproject execution over time.

- Identify the situational and contextual contingencies in the design of these networks and their governance approaches, their strengths and weaknesses, as well as related performance implications.

- Develop a practitioner-ready framework of practices and theories, together with their contextual contingencies, to better understand, design, adjust, and govern these networks for the benefit of the organizations and their projects.

3. Literature Review and Conceptual Framework

Project management generally explains project governance through the lenses of six reoccurring theories (Biesenthal & Wilden, 2014). These are: agency theory (e.g., Müller & Turner, 2005), transaction cost economics (e.g., Turner & Keegan, 2001), stakeholder and shareholder theories (e.g., Müller & Lecoeuvre, 2014), stewardship theory (e.g., Toivonen & Toivonen, 2014), and resource dependence theory (e.g., Drouin & Besner, 2012; Drouin & Jugdev, 2014). The literature review highlighted that most studies in this field focus either on the hierarchical or networked part of the project's structure, but fail to address how they coexist and interact in complex settings such as interorganizational projects (Šimkonis et al., 2021). Interorganizational settings refer to complex, large infrastructure projects or megaprojects such as EXPO 2010 in Shanghai (Li et al., 2018; Zhai et al., 2017) or the Sydney Olympics (Clegg et al., 2002). They are characterized by their organizational heterogeneity and their structural complexity that blends hierarchical, nonhierarchical, and networked topologies (Denicol et al., 2021). Current theories in project management are ill-fitted to operationalize their governance. This is a serious limitation. To address this issue, the scope of our literature review was widened to include alternative governance theories.

Multilevel governance theory (**MLG**) (Hooghe & Marks, 2001), borrowed from the field of political science, was identified as particularly promising. MLG allows consideration of hierarchical and networked governance structures simultaneously and provides a framework that can be applied to other preexisting theories. To that end, MLG distinguishes between two types of governance that coexist through three interface entities. Type I governance offers a vertical, system-wide perspective (hierarchies) while Type II governance offers a horizontal, task-oriented perspective (networks) (Bache et al., 2016;

Hooghe & Marks, 2003). Type II governance usually emerges within Type I governance, and the relationships between the two types of governance give rise to the formation of clubs, agencies, and boards. (Skelcher, 2005). The relevance and applicability of multilevel governance theory in the context of complex interorganizational project settings was validated by our research team (Šimkonis et al., 2021). Multilevel governance theory was therefore used in this research to explain **network governance** for interorganizational projects.

However, organizations are usually involved in a multitude of projects simultaneously and, by the same token, participate in more than one interorganizational network at a time. For instance, if project 1 is made up of companies A, B, C, and D; project 2 of companies A, D, E, and F; and project 3 of companies A, C, E, and F, it becomes clear that collaborations between networked organizations can reoccur over time and over projects. This suggests the need for a higher level of governance than what is typically addressed through network governance theory. It is necessary to move beyond network governance's project-centric perspective to consider the governance of several interorganizational networks for joint projects. To that end, we follow Morris (1997) and Müller and colleagues (2014) and distinguish between network governance and **governance of networks**. In simple terms, governance of networks refers to the governance of a network of networks. It addresses the multiplicity of networks a project owner or investor organization is part of, such as networks of companies bidding together or other networks where companies execute projects jointly. In the example above, company A is the investor organization that is simultaneously running the three projects made of overlapping networked organizations. Investor A leads the governance of networks and is responsible for reducing friction between the networks and ensuring ethical and efficient collaboration. As will be discussed in more detail in Section 5, it is the governance of networks that delineates the formation (Kapucu & Hu, 2020), structure (Müller & Lecoeuvre, 2014), accountabilities, responsibilities, and modes of collaborations (DeFillippi & Sydow, 2016) among networks.

The literature review further pointed to a third level of governance. Indeed, the governance of networks operates within a larger frame of policies and guidelines referred to as **metagovernance**. Metagovernance

serves to avoid governance failure (Gjaltema et al., 2020) by regulating the balance between four metagovernance modes, which set the ground rules for implementing governance at the two levels described above. It does that by defining what is allowed in terms of project types (meta-exchange), organizational setups (meta-organization), governance setups (meta-heterarchy), collaborations (meta-solidarity), and the balance of these four modes (Jessop, 2015).

In summary, the literature review identified three layers of governance. The first is network governance, which is best explained though multilevel governance theory.

The second is governance of networks, which applies to interorganizational networks for joint projects. The third is metagovernance, which sets the ground rules for governance. Although these layers of governance were identified and discussed in the existing literature, our review highlighted that there was no study addressing the way these three governance layers interact with one another. Our research project was designed to bridge this gap by integrating the three identified governance layers into one overarching, theoretical perspective for the governance of interorganizational networks for joint projects.

4. Methods

The study was carried out in three steps, each one feeding into the next:

- Step 1—Literature review: Following the five-step process by Pawson and colleagues (2005) and using analysis techniques as described by Miles et al. (2014), our team proposed an evidence-based categorization for structural designs, governance practices, theories, and performance. This step identified "what works in which context" and deepened our understanding of what steers and controls the formation and life cycle of interorganizational networks for projects. The results of the systematic literature review guided the conception of the qualitative study.

A subsequent global mixed-methods study, in a sequential qualitative-quantitative design (Saunders et al., 2019), was launched. Mixed-method studies are also particularly well suited to the project's philosophical stance of critical realism (e.g., Archer et al., 1998; Bhaskar, 1975), which values the integration of both objective (quantitative) and subjective (qualitative) perspectives in search for a plausible explanation of a given phenomenon (Bhaskar, 2016).

- Step 2—Qualitative data collection and analysis: Our international research teams collected data from the following nine countries: Australia, Canada, China, Finland, Germany, Iceland, Iran, Lithuania, and Norway. A total of 124 semistructured interviews were conducted as part of 28 case studies worldwide.

A case study was defined as a network of at least three companies that had worked together multiple times, and on multiple projects, in the past 5 years. The case study design followed Yin's (2009) multiple cases design. Data collection was done through interviews and theory development by following the constructing mystery approach developed by Alvesson and Kärreman (2007). This abductive process allowed for the emergence of a multilevel governance framework model that was validated through the quantitative study.

- Step 3—Quantitative data collection and analysis: Using a web-based questionnaire, the survey was distributed to project managers and managers in network governance roles worldwide. Relying on factors and regression analysis techniques, the quantitative survey's aim was to test, validate, and expand the hypotheses and model developed in step 2. This implied a cross-sectional snowball approach to sampling and the collection of demographic data. A total of 225 usable responses were received and the resulting analysis came to support the initial qualitative analysis' hypotheses and model.

The above-mentioned steps were complemented with additional theory development, where the results from the three studies (literature review, qualitative, and quantitative investigation) were integrated to develop a generalizable and reliable framework of governance approaches and their situational contingencies. The results are further summarized in Section 5 as a practitioner-ready framework of suggested practices and guidelines for governance of interorganizational networks.

5. Results and Discussion of Findings

The results of the qualitative study facilitated the construction of a multilevel governance model in the context of large and megaprojects (see Figure 5.1 below). This model links governance layers from the country-level or investor context to the governance of individual projects and provides a comprehensive view on: a) what the governance levels and dimensions of interorganizational project networks are, b) how and why they interact, and c) what the enablers/disablers of the governance setups are that lead to decisions taken at appropriate levels, leading to the best outcomes for projects.

Three categories of governance were identified: metagovernance, governance of networks, and network governance. The settings of each upper layer set the foundation and limitations for the emergence of governance within the next layer, and hence the layers are interrelated. Each element of the layer, in turn, is defining and limiting, e.g., meta-exchange in the metagovernance layer will define project types. Furthermore, each layer's interplay is influenced by enablers/disablers—as an inseparable part of the model (see Figure 5.1 above).

Metagovernance manifests itself as the (semi) permanent policies and/or guidelines, set by the owner or investor (e.g., government), and as context for the subordinated governance layers. It forms the underlying conditions for networks to emerge. In line with Jessop (2015), our research indicated the following modes of metagovernance:

- *Meta-exchange* determines the purpose of a network for projects and is influenced by the upcoming projects on the government's list of
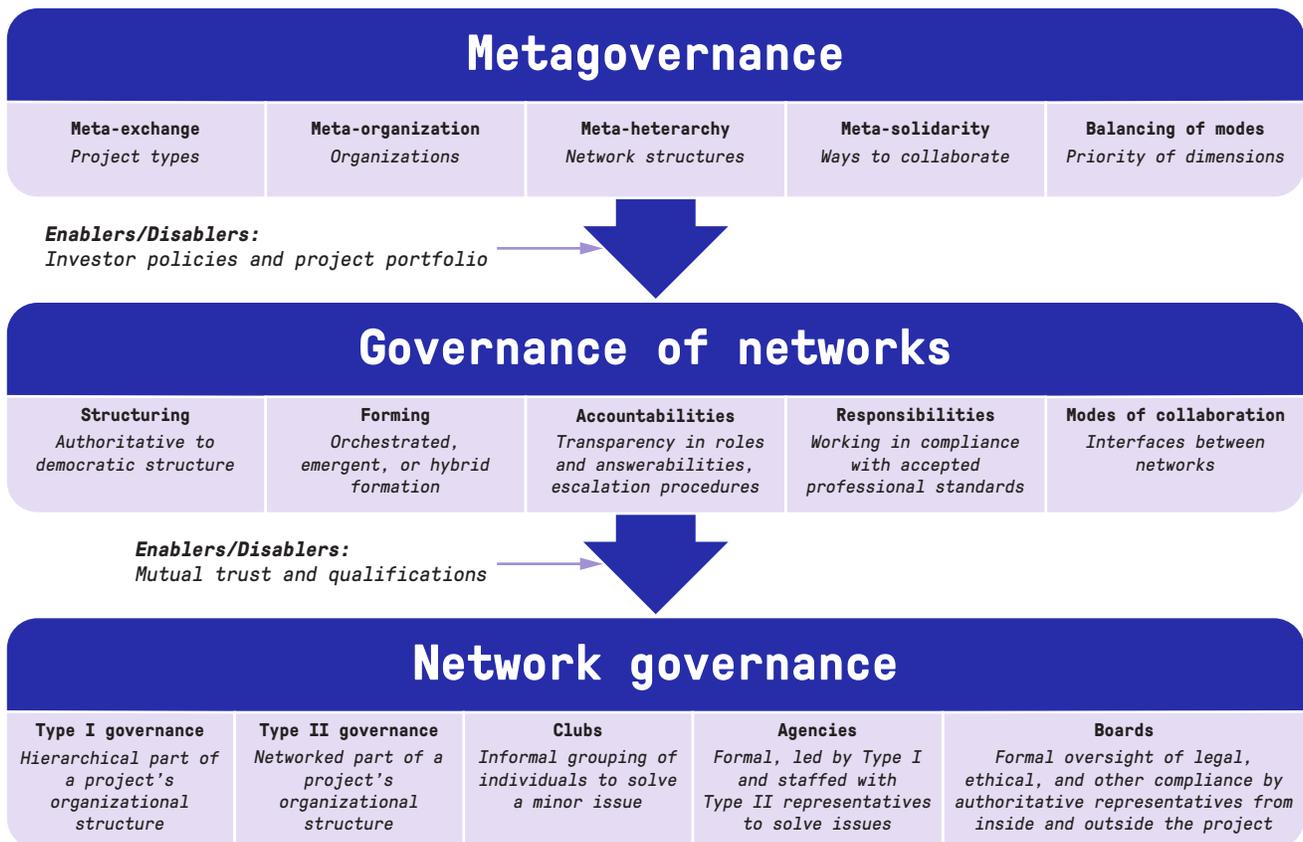
Metagovernance

Meta-exchange	Meta-organization	Meta-heterarchy	Meta-solidarity	Balancing of modes
Project types	*Organizations*	*Network structures*	*Ways to collaborate*	*Priority of dimensions*

Enablers/Disablers:
Investor policies and project portfolio

Governance of networks

Structuring	Forming	Accountabilities	Responsibilities	Modes of collaboration
Authoritative to democratic structure	*Orchestrated, emergent, or hybrid formation*	*Transparency in roles and answerabilities, escalation procedures*	*Working in compliance with accepted professional standards*	*Interfaces between networks*

Enablers/Disablers:
Mutual trust and qualifications

Network governance

Type I governance	Type II governance	Clubs	Agencies	Boards
Hierarchical part of a project's organizational structure	*Networked part of a project's organizational structure*	*Informal grouping of individuals to solve a minor issue*	*Formal, led by Type I and staffed with Type II representatives to solve issues*	*Formal oversight of legal, ethical, and other compliance by authoritative representatives from inside and outside the project*

Figure 5.1: Levels and dimensions of governance in large and megaprojects.
Source: Müller et al. (under review)

projects. Meta-exchange decisions include those for creating new or extending existing markets/products/services. Hence, it determines the types of projects to be executed by the networks. Examples include a railway project in Scandinavia, where the owner decided (together with the beneficiaries) on the project type and benefits it should create (Šimkonis et al., 2021). A more prominent example is the construction of the Berlin Brandenburg International Airport (FBB), where the owner (local government) decided to turn down the turnkey offer from construction firms and instead broke the project into a set of five lots, which later became 50, thereby creating a large network of networks for one single project (Teworte & Albeniz, 2015).

- *Meta-organization* provides the ground rules for decisions on the organizations to be involved. For example, prioritizing local (national) organizations over regional suppliers. This may also include the exchange of main contractors failing to meet performance expectations, or allowing the creation of new organizational units, such as project management offices (PMO) when the need arises, as in the case of FBB, described above (ibid).

- *Meta-heterarchy* frames the structure of possible networks, for example, by setting the conventions in terms of more hierarchical or more democratic structures. This reflects the owner/investor's attitude toward the avoidance of governance failures, through the type of "structural system." Examples for this include government policies for public tendering. Other examples include allowing the restructuring of the network of networks for FBB into a program that bundled the tasks necessary to accelerate achieving operational use of the airport (ibid).

- *Meta-solidarity* frames the ways for developing collaborations, exchanging knowledge, and other types of interactions. Examples include building and maintaining specific communities, like the CONCEPT program by the Norwegian government, which funds research on, and knowledge dissemination of, large projects' governance by bringing together stakeholders within and across industry, academia, and national borders (NTNU, 2021). In the case of FBB, a program office established on-site fostered communication between internal and external experts from various disciplines, such as FBB managers, construction firms, external consultants, and general planners (Teworte & Albeniz, 2015).

- *Balance of metagovernance modes* adjusts the emphasis of the modes to changing circumstances to minimize the risk of failure in the governance of networks. This can be achieved, for example, by emphasizing meta-solidarity to ensure that no relevant organization is left out in the update of new safety standards. The examples from the FBB case show emphasis on meta-exchange in the early stages, followed by emphasis on meta-organization, and finally emphasis on meta-heterarchy and meta-solidarity in order to address the issues at hand.

Shaped by the metagovernance context, **governance of networks** addresses the variety of networks created for different long-term and short-term purposes, which together contribute to better project goal accomplishment. Governance of a number of networks is embedded, formed, and maintained at this level. Formation, structure, accountabilities, responsibilities, and modes of collaboration among networks are decided at this layer (Kapucu & Hu, 2020; Müller & Lecoeuvre, 2014; DeFillippi & Sydow, 2016).

- *Structuring.* Organizations activate different networks at different points in time. For example, training and knowledge-sharing network activities can be organized between projects with the networked organizations. At another point in time, for example, during tendering, information-sharing meetings can be held with the networked organizations to identify and select potential candidate organizations for a project.

- *Formation* of these networks is pursued by different means. In cases of public projects, an official call for tender is issued, ensuring transparency and neutrality in the selection of participating organizations. In private sector projects, an informal call for tender is often sent to a few selected companies, inviting them to submit their proposal.

- *Accountabilities* provide transparency in roles and answerabilities, as well as escalation procedures. For example, escalation procedures with clear roles and associated names.

- *Responsibilities* correspond to compliance with accepted professional standards. Illustration of such mode is following ISO 21505, the standard for governance of projects, programs, and portfolios.

- *Modes of collaboration* define interfaces between networks. An example of such collaboration is the setup of digital infrastructure for construction projects through collaboration of companies from the project execution and from the education network (e.g., building information modeling [BIM]).

Network governance is the layer describing governance of one interorganizational network (see Figure 5.1 above). In line with previous literature (Šimkonis et al., 2021), results of the research indicate that governance here is achieved through certain entities—clubs, agencies, and boards, situated between Type I and Type II governance (see Figure 5.2), which in turn are interrelated. Type I governance describes the hierarchical part of the project organization structure, while Type II reflects the networked or nonhierarchical part of the project organization structure.

Clubs emerge from different disciplines as a group of volunteers, as in the case of a real estate development project with more than 100 subcontractors. In this context, voluntary, cross-organizational collaboration (club) emerges as an effective way to fix particular problems (e.g., repair of broken machinery or installation of unplanned equipment) in order to stay on schedule. This collaboration typically builds on high levels of mutual trust in the abilities to solve the issues collaboratively toward desired outcomes.

Agencies are more formal decision-making bodies than clubs. Agencies are typically headed by a Type I governance representative, and staffed with subcontractor resources, which may work across a number of different agencies. An example is a Scandinavian railway project, where the national government was both owner and client, and which employed about 120 subcontractor resources. Here, 10 different agencies, each led by a formally appointed representative from the different beneficiary groups or other steering group members, headed the agencies staffed with subcontractor resources.

Boards are formal entities, handling official governance-related issues for the project. By their nature, boards are more closely aligned with the project owner (e.g., municipality) and are more concerned with compliance and correctness. In our data, this can be illustrated with the construction of a public building in a mid-size city project. Altogether, this project employed about 100 resources from 10 different companies. The city government was the project owner and client. The project organization was headed by a temporary project organization that reported to the city government. In this case, the local municipality set up and appointed members for official boards, such as users, financing, and technical issues. Project management was done by the prime contractor, which in turn reported to the temporary project organization

The quantitative results of the study confirmed the multilevel governance of interorganizational project networks and unveiled, in more detail, the dimensions contributing to success, which are described in the conclusion section of this paper.
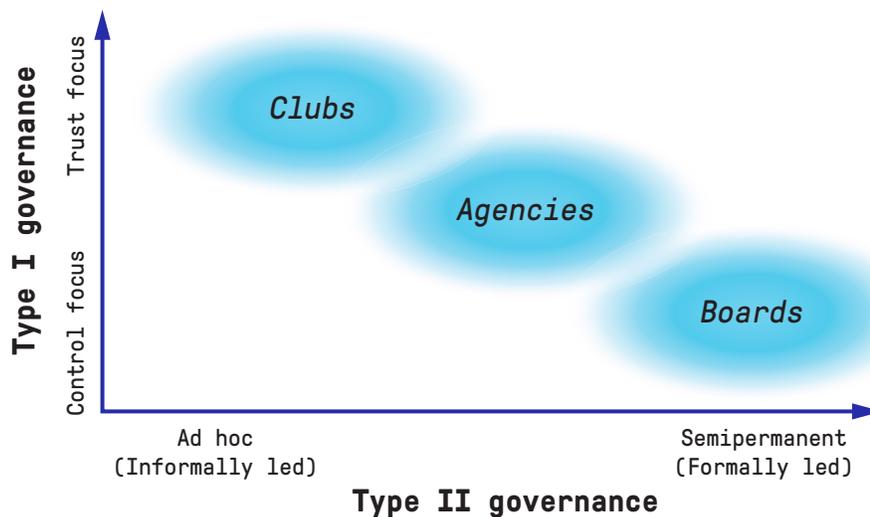

Figure 5.2: Relationships between Type I and Type II governance.
Source: Šimkonis et al. (2021)

6. Practical Application of the Findings

At least five practical applications of the findings emerge from the study.

- **A range of options**. A first practical application for practitioners is to be aware of the range of options they have to structure their interorganizational networks for repetitive project execution. For instance, such options are: different types of networks, their formation, and their potential risks for governance failure. In fact, practitioners must be conscious of the metagovernance modes and their content, and how they might change over time, so as to adjust the project and its governance to changing circumstances instead of blindly accepting traditional progressions.

- **Proactive management of dependencies between the layers**. Metagovernance provides the context for the governance of networks, where a variety of networks are created for different purposes, which together support better project goal accomplishment. Practical application includes awareness of the hierarchy and the dependencies between the layers. For example, a more authoritarian meta-heterarchy leads to strict process compliance when doing network formation. Strict network formation typically leads to more hierarchical structures (at the governance of networks level), which might not always be appropriate for project delivery. Contrarily, meta-heterarchy that allows freedom and spontaneity in network formation typically leads to more democratic network governance structures and could be more appropriate for some projects.

- **Clear accountabilities**. For good project results, a third practical application for practitioners is to understand that it is the responsibility of governance of networks to ensure a balance between formal and informal governance structures, clear definition of roles and responsibilities, accountabilities at all levels, and the modalities of collaboration between networks.

- **Avoid an "iron cage."** A fourth practical application for practitioners is to avoid the building of an iron cage of being in either Type I or Type II governance. It emphasizes the freedom for Type II organizations to self-organize, and to establish flexibility and resilience for the network. It encourages the implementation of democratic governance structures. It proposes moving from authoritative to democratic, thereby changing the governance mechanism from control to trust.

- **Define standards**. A last practical application for practitioners is to coordinate networks (at the governance of network level) by defining "standards." For example, practitioners may ask the network to only use firms that provide fully trained employees or to train the employees.

7. Conclusions

The study provided new insights into the governance of interorganizational networks. Three regulative governance layers were identified and their impact on project and governance performance was assessed.

The answers to our original research questions are as follows:

RQ1: How are longer-term interorganizational networks formed and governed for joint large and megaprojects?

The most fundamental ground rules for project execution are set by governments or investors through *metagovernance*. This influences all subsequent governance layers. First, it influences the *governance of networks* in which the project sponsor/owner's organization participates, and new networks emerge as described in the next paragraph. Second, it influences the *network governance* for the delivery of a project by a group of networked organizations. The three governance layers interact and jointly impact project success.

RQ2: Which theories, structural designs, and governance practices are used in different contexts?

Metagovernance theory, with its five dimensions, applies to the *metagovernance* context. Here, the investor or government defines the projects (meta-exchange), the scope of participating organizations (meta-organization), the network formation and structure (meta-heterarchy), and the ways participants in the network collaborate (meta-solidarity). These four modes require balancing; that is, continuous adjustment to changing circumstances, such as markets, technology developments, or higher-level objectives (e.g., pursuing the United Nations Sustainable Development Goals). Large and megaprojects in the public sector often lend themselves to hierarchical structures due to the authoritative position of the investor. Here, policies and formal processes might dominate practices. However, this may differ in private settings, allowing less-strict governance implementations.

Metagovernance provides the framework within which the *governance of networks* arises, theorized as the interaction of structuring, network formation, defining accountabilities, responsibilities, and the modes of collaboration between networks. These networks include those for professional qualification to participate in projects (e.g., ISO, technology, or safety certification) or

networks resulting from project tendering, selection, and execution processes. New networks are formed and structured guided by metagovernance, and emerge through informal collaborations or are orchestrated through formal selection processes or hybrids thereof. Governance in this context is typically done by the sponsor/owner and/or the project management organization, which also defines the accountabilities, responsibilities, and modes of collaboration among the participating networks.

Networks formed for delivering a particular project are subject to *network governance*, which is explained by multilevel governance theory. These networks are typically structured in a hierarchical part (a.k.a. Type I governance), where the managing organizations (e.g., project management, tier 1 suppliers) establish clear lines of authority and accountabilities for project delivery. This is complemented by a networked part (a.k.a. Type II governance), where suppliers work in democratic and flexible relationships for task delivery and technical problem-solving. Type I and II organizations interact through organizational entities of different levels of formality. These include informal collaborations of suppliers as practices to solve sudden issues (i.e., clubs); formal entities for addressing upcoming questions, more significant issues, and value creation (i.e., agencies); and formal authoritative entities for overseeing legal, ethical, and otherwise correct execution of the project in respect to stakeholder expectations (i.e., boards).

Together, the three governance layers span the entire governance range from the investor to the individual project, including its many different participating organizations and their qualifications.

RQ3: What are the implications of different network governance approaches for project and network governance performance? In other words, how does interorganizational governance influence project success?

The three governance layers have a collective and strong impact (51%) on project and governance performance. Metagovernance has a direct positive impact on performance. The higher the sum of all metagovernance measures, the higher the performance measures. However, the strictness of the governance implementation moderates this impact. More authoritarian governance structures amplify the metagovernance impact. For example, weak expressions (or low measures) of metagovernance are associated
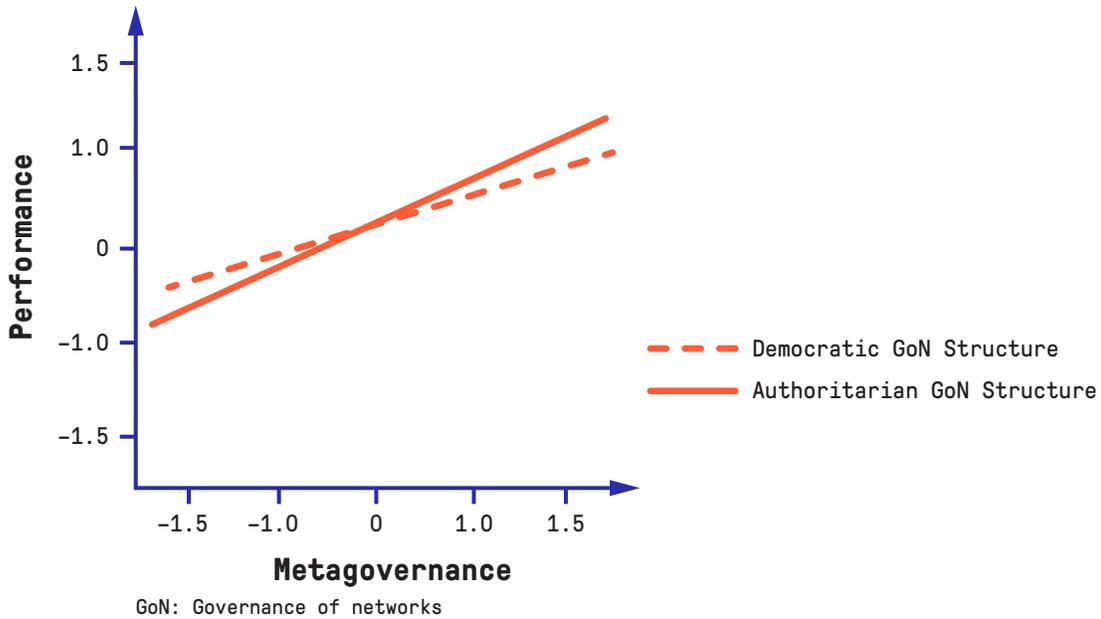
GoN: Governance of networks

Figure 7.1: Interaction effect of governance of networks structure and metagovernance.

with low performance levels, whereas strong expressions of metagovernance are associated with the highest levels of performance. This effect differs from settings with more democratic governance structures. Here, the lower levels of metagovernance have a less-negative effect on performance. The democratic structures compensate for the lack of metagovernance. However, the same dampening effect leads to a less-steep increase in performance when metagovernance measures are increasing. Figure 7.1 shows this, with performance and metagovernance measures being normalized; that is, mean values are zero, and measures are in standard deviations.

The clear definition of responsibilities at the governance of networks level also has a positive and direct impact on performance. However, similar to the above effect, this impact is moderated by the strength of Type II
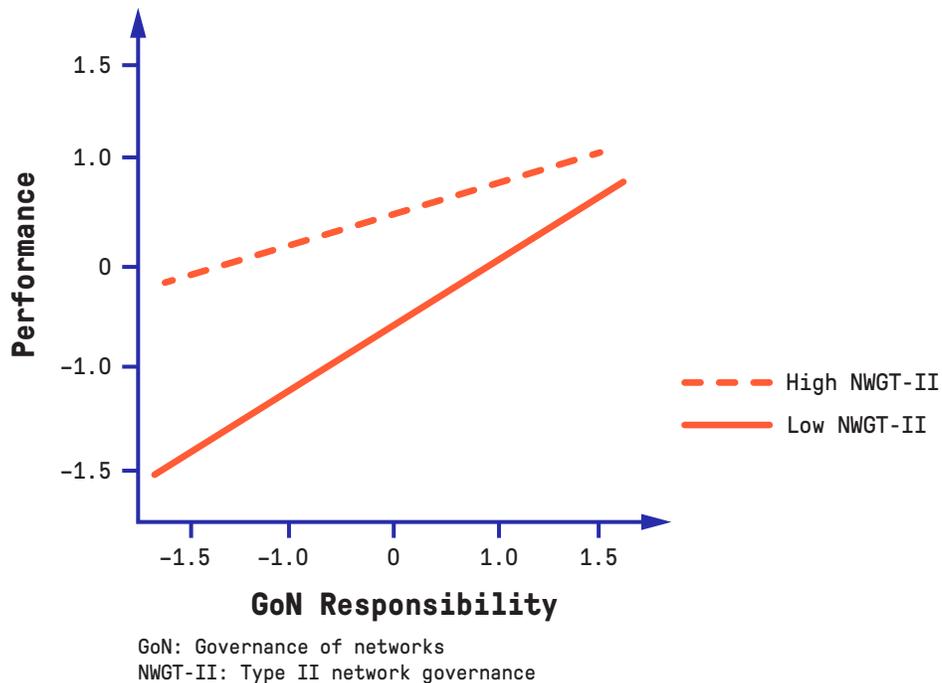

GoN: Governance of networks
NWGT-II: Type II network governance

Figure 7.2: Interaction effect of Type II network governance and governance of networks responsibilities.

governance (see Figure 7.2). Type II governance is strong when suppliers collaborate to deliver project outputs, informally steer the ad hoc use of resources, and their responsibilities overlap. The impact of clear responsibilities on performance is much stronger in settings that lack good Type II governance. Here, unclear responsibilities are associated with the lowest performance measures. Increasing clearness of responsibilities leads to a steep increase in performance. This differs from settings with a strong expression of Type II governance. Here, the lack of clear responsibilities has almost no detrimental effect. Even in the absence of defined responsibilities, average levels of performance are accomplished. Increasing the clearness of responsibilities leads to higher performance levels. Generally speaking, strong Type II governance implementations lead to better performance than their weak counterparts.

Clearness of accountabilities at the governance of networks level positively and directly impacts performance. The clearer the definition of accountabilities among the networks, the better the project and governance performance. This includes transparency in accountabilities (who is answerable for what), roles (who does what), and the clearness of escalation procedures within and beyond the individual project.

In summary, metagovernance and the governance of networks' clearness of responsibilities and accountabilities impact performance positively. The strength of the impact of metagovernance is influenced by the strictness of the implementation of governance. Similarly, the strength of the impact of clear responsibilities is influenced by Type II governance. Only the clearness of accountabilities has a direct impact, and it is not influenced by any other studied variable.

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Appendix B: List of Outputs

Journal papers (under review)

Müller, R., Alix-Séguin, C., Alonderienė, R., Bourgault, M., Chmieliauskas, A., Drouin, N., Ke, Y., Minelgaite, I., Pilkienė, M., Šimkonis, S., Unterhitzenberger, C., Vaagaasar, A. L., & Wang, L. (under review). A (meta)-governance framework for multi-level governance of inter-organizational project networks. Submitted to *International Journal of Project Management* (under review).

Unterhitzenberger, C., Müller, R., Vaagaasar, A. L., Ke, Y., Alonderiene, R., Minelgaite, i., Pilkiene, M., Wang, L., Drouin, N., Chmieliauskas, A., Simkonis, S., & Mongeon, M. (under review). A governance model for inter-organizational project networks, Submitted to *Project Management Journal* (under review).

Wang, L., Müller, R., & Zhu, F. (under review) Network governance for inter-organizational temporary organizations: A systematic literature review and research agenda. Submitted to *Project Management Journal* (under review).

Conference papers

Šimkonis, Š., Müller, R., Alonderienė, R., Chmieliauskas, A., & Pilkienė, M. (2021). Multi-level governance in inter-organizational project settings. In *Proceedings of the British Academy of Management (BAM) Conference in the Cloud,* October 31 to September 2, 2021, Lancaster University, UK (pp. 1–20).

Wang, L., Müller, R., Chmielauskas, A., Alonderiene, R., Drouin, N., Ke, Y., Minelgaite, I., Mongeon, M., Pilkiene, M., Simkonis, S., Unterhitzenberger, C., Vaagaasar, A. L., & Zhu, F. (under review). Balancing hierarchy and network: Governance of interorganizational networks for projects. Submitted to *European Academy of Management Conference*, 2022.

Wang, L., Zhang, C., & Zhu, F., (2021). Supplier governance of inter-organizational projects from the perspective of institutional logic—The evidence from supplier management system of China Communications Construction Company. In *Proceedings of the Smart City and Intelligent Construction Conference*, September 18–19, 2021, Wuhan, China (in Chinese) **[Best Conference Paper Award].**

Master's theses

Arnardóttir, D. (2021). *Governance of long-term inter-organisational networks: A comparative case study in the Icelandic construction industry.* Master of Science in Project Management thesis, School of Business, University of Iceland.

Gunnlaugsdóttir, H. K. (2021). *Effectiveness of inter-organisational network performance in the Icelandic construction industry from the perspective of long-term governance approaches.* Master of Science in Project Management thesis, School of Business, University of Iceland.

Newspaper articles

Arnardóttir, P., Gunnlaugsdóttir, K., & Minelgaite, I. (2020, December 21). Network management in the construction industry: A useless resource? *Kjarninn (The Core).* Retrieved from https://kjarninn.is/skodun/2020-12-18-stjornun-tengslaneta-i-byggingaridnadinum-onytt-audlind/

Presentations and talks

Müller, R. (2021). *Meta-governance and multi-level governance in inter-organizational networks for projects.* Keynote at World Project Management Forum (WPMF), December 2021.

Müller, R. (2021). *Multi-level governance in inter-organizational project networks.* Keynote at Project Governance and Control Symposium (PGCS), Canberra, August 2021.

Müller, R. (2021). *Multi-level governance in inter-organizational networks for projects.* Keynote at IPMA Research Conference, June 2021 (online).

Müller, R. (2021). *Meta and multi-level governance in inter-organizational project networks.* Presentation at EDEN Doctoral Workshop, SKEMA Business School France, August 2021.

Müller, R. (2021). *Multi-level governance in inter-organizational networks for projects.* Presentation at Project Governance Online Seminar at Dalian University of Technology, China, July 2021.

Appendix C: Biographical Sketches of Investigator Biographies

PRINCIPAL INVESTIGATOR:

Ralf Müller, DBA, MBA, PMP, is Professor of Project Management at BI Norwegian Business School and an Adjunct Professor at University of Technology Sydney and Dalian University of Technology in China. He is Editor-in-Chief of the *Project Management Journal*® and a Fellow of both the Project Management Institute (PMI) and the Centre for Excellence in Project Management. He lectures and researches worldwide in leadership, governance, and organizational project management. His research work has appeared in more than 280 academic publications and was acknowledged by PMI, IPMA, Emerald, and others with 18 awards, including several lifetime achievement awards. A recent study by Stanford University identified him among of the top 2% of the most influential scientists worldwide. Before joining academia, he spent 30 years in the industry consulting with large enterprises and governments in more than 50 different countries for better project management and governance. Projects he worked on span from small up to US$5 billion in value. He has also held related line management positions, such as the Worldwide Director of Project Management at NCR Corporation.

CO-INVESTIGATORS:

Australia:

Yongjian Ke, PhD, is an Associate Professor in Project Management in the School of Built Environment at the University of Technology Sydney in Australia. He has a doctoral degree in Management Science and Engineering, and a BEng in Project Management from Tsinghua University in China. He currently serves as a Department Editor for the *Project Management Journal* and is a Guest Professor at Chang'an University in China. His research spans a wide range of problems in delivering infrastructure projects, focusing on risk allocation and management, contracting behaviors, social acceptance, and social sustainability. He is particularly interested in investigating public-private partnership and its implementation in the infrastructure sector. His work has recently focused on using social media in project management and applying the concept of "social license to operate in infrastructure projects to improve community engagement." As of December 2021, Dr. Ke has published 123 papers, which have generated 5,059 citations with an h-index of 31 and an i10-index of 50.

Canada:

Nathalie Drouin, PhD, MBA, LLB, is the Executive Director at KHEOPS, an International Research Consortium on the Governance of Large Infrastructure Projects, the Editor-in-Chief of *International Journal of Managing Projects in Business*, a full Professor at the Department of Management, École des Sciences de la Gestion, Université du Québec à Montréal (ESG UQAM), Adjunct Professor at University of Technology Sydney (UTS), Australia, and Associate Researcher at École Nationale D'Administration Publique (ENAP), Canada. She teaches initiation and strategic management of projects in the graduate project management programs at ESG UQAM. Her research has been funded by various research councils. The result of her work has been published in major academic journals and presented at several international conferences. She is looking at organizational project management, leadership issues, and megaprojects. She is a former member of the PMI Academic Insight Team. She is also a member of the Board of Directors of the Logistics and Transportation Metropolitan Cluster of Montreal (CARGO M) and an Audit Committee Member of Parks Canada Agency Audit Committee, Government of Canada. With Ralf Müller and Shankar Sankaran, she has won the 2021 PMI David I. Cleland Project Management Literature Award for the book *Organizational Project Management: Theory and Implementation*, and the 2019 Walt Lipke Project Governance and Control Excellence Award for the following paper: A Model of Organizational Project Management and its Validation Project and Program Symposium, as well as the 2019 International Project

Management Association IPMA Research Award for the research work: (2018) Balancing Person-Centric and Team-Centric Leadership in Projects.

Mylène Mongeon, MA, is a research analyst at KHEOPS, an International Research Consortium on the Governance of Large Infrastructure Projects.

China:
Linzhuo Wang, PhD, is a postdoctoral researcher at the School of Economics and Management, Dalian University of Technology (DUT), Dalian, China. He conducts research on project resilience, network governance, and leadership. His work has appeared in more than 15 academic publications. His research has been funded by Project Management Institute and China Postdoctoral Science Foundation.

Fangwei Zhu, PhD, is a Professor and Dean of the Faculty of Management and Economics, Dalian University of Technology (DUT), Dalian, China. He is the Director of Institute of Enterprises Management in DUT. He is also the Executive Director of the China Management Case Sharing Center. He conducts research in organizational project management, network governance, and EPC project management. The results of his studies appeared in more than 60 publications, including six books, and six top 100 Chinese management cases in six consecutive years.

Iceland:
Inga Minelgaite, PhD, is a Professor at School of Business, University of Iceland, visiting professor at a several universities in Europe, serves as board member at two universities in Lithuania, and has cooperated with triple crown universities in recent years. Dr. Minelgaite's main field of research is (cross-cultural) leadership and organizational project management. She is global manager for the FEELS (Follower-Endorsed Effective Leadership and Sustainability) project and GLOBE project country collaborator. Dr. Minelgaite is co-author of the first book on organizational leadership in Iceland, *Demystifying Leadership in Iceland: An Inquiry Into Cultural, Societal, and Entrepreneurial Uniqueness*, which was nominated for the Book of the Year award at EURAM. Prior to joining academia, she held various managerial positions, including director and CEO. During recent years, her cooperation with industry includes global leaders in respective fields.

Lithuania:
Raimonda Alonderienė, PhD, is a Professor at ISM University of Management and Economics (Vilnius, Lithuania) and Director of People and Organizational Development at Devbridge. She teaches, consults, and publishes research papers and cases. Dr. Alonderienė has improved her competence in "International Management Teachers Academy," in Slovenia, the United Kingdom, Switzerland, Germany, and Austria. Her research areas are leadership, human resource management and development, and project management.

Alfredas Chmieliauskas, PhD, is an Associate Professor at ISM University of Management and Economics (Vilnius, Lithuania). He holds a doctorate degree in computer systems and networks from Latvian Academy of Sciences and a master's degree in mathematics from Vilnius University, Lithuania. He also holds an A-level certification from International Project Management Association (IPMA) and is a first national assessor appointed by IPMA. Dr. Chmieliauskas is a cofounder (1999) and president (2014-2018) of ISM University of Management and Economics in Vilnius, Lithuania, and a cofounder (2004) and president (2004-2015) of the Lithuanian Project Management Association. Currently, he also serves as a board member of the Lithuanian Government Strategic Analysis Center (STRATA). As a consultant and owner of a project management consulting company, he has provided training and consulting services to more than 250 business and public sector organizations. His teaching and research areas focus on project, program, and portfolio management; innovation; and change management.

Margarita Pilkiene, MSc, works at ISM University of Management and Economics (Vilnius, Lithuania) as the Director of Educational Leadership master's program. In ISM Executive School, she heads the applied organizational psychology and human resource management modules of the general management program. As a scholarly practitioner and consultant-expert, Ms. Pilkiene not only teaches in the ISM Executive School, but runs in-company and open trainings for nonformal executive education. As a research fellow, she participates and runs research in international projects, as well as publishes in peer-reviewed international journals. Her main research and teaching areas are educational leadership, project leadership, OB, and organizational culture.

Saulius Šimkonis, PhD, is an Associate Professor at ISM University of Management and Economics where he leads the innovation and project management module for the Master of Management Studies in the Executive School. He is a project, program, and portfolio management (PPM) practitioner, consultant, and trainer with more than 25 years of experience. Dr. Šimkonis has the following certifications: IPMA-A, Project Management Professional (PMP)®, and PRINCE2 Practitioner. Currently, he is a project portfolio manager at Swedbank. He previously worked at Oracle as a principle project manager. Throughout his career, Dr. Šimkonis led major projects; consulted and delivered training in the fields of project, program, and portfolio management, process maturity improvement, and risk management; and facilitated lessons learned sessions. He graduated from ISM University of Management and Economics. He later defended his dissertation "Factors Influencing Lessons Learned Processes in Innovative Projects" at Vilnius University. His recent research interests are in the fields of project governance, leadership, and interorganizational project networks.

Norway:

Anne Live Vaagaasar, PhD, is an Associate Professor in the Department of Leadership and Organization at BI Norwegian Business School. She is the Director of BI's executive project management programs, and she teaches in a broad range of project management topics. She is the author of several international textbooks and journal articles within the project management field. Her research focuses on project organizing, coordinating, and collaborating in large projects, as well as temporal matters and knowledge work in the context of project-based organizing. She serves on the governmental board for development of public project work and coleads the Norwegian Centre for development of project processes and project-based firms.

United Kingdom:

Christine Unterhitzenberger, PhD, is an Associate Professor of project management at the University of Leeds and a Chartered Project Professional (ChPP). Her research is focused on organizational and relations aspects in projects and has been published in the leading journals in the field as well as presented at major international conferences. She is a Department Editor for the *Project Management Journal*, founding chair of the Project Experiences SIG at the British Academy of Management, and chair of the Research Advisory Group of the Association for Project Management. She has taught on various undergraduate and postgraduate programs for different aspects of project management as well as research methods. She has also developed and delivered project management courses for Executive Education and is a regular speaker at industry events. Prior to her academic career, she worked for almost 10 years as a project manager in the construction industry.