Research Paper **Open Access**

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Effects of lagging projectification in the public sector on realizing infrastructure projects

DOI 10.2478/otmcj-2022-0002
Received:January 12, 2022; Accepted: February 06, 2022

Abstract: The public sector in Germany lags behind the economy in terms of projectification, i.e., the prevalence of projects and experience in applying project management. This has significant implications for realizing complex infrastructure projects in which the public sector is involved as one of the main actors. Nowadays, projectification represents a particular way of thinking about how to embrace a series of dynamic and challenging changes, design them, and implement them effectively for the benefit of society. A quantitative study of projectification in society in Germany was the starting point for our research, the results of which we compared with data from earlier studies of projectification in the economy. Using an interpretative case study drawing on insights from the Berlin Airport, we analyzed the impact of lagging projectification in the public sector in Germany on realizing infrastructure projects to propose suitable approaches. The results of this case study reveal significant effects of lagging projectification in the public sector of Germany on realizing infrastructure projects. In the case of the Berlin BER Airport, an inadequate governance system led to a 9-year delay in the completion date and a 250% overrun of costs directly attributable to the project. This could have been avoided by involving the private construction industry more collaboratively, by building on previous experiences gained, and by a more cooperative way of project planning and implementation. To guide future research, hypotheses are derived that can be used to analyze the underlying problem in greater depth and to derive recommendations for action.

Keywords: projectification, public sector, society, infrastructure projects, Germany

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1 Introduction

Although Germany is generally known for advanced engineering and project management, potential failures of complex infrastructure projects, such as the Berlin BER Airport, have been a frequent occurrence (Kostka and Fiedler 2015). Since, in most of these cases, the public sector is responsible for the execution of these projects, we have explored what effects a lagging projectification in the German public sector may have on realizing infrastructure projects. Therefore, the findings are relevant not only for the public sector but also for the private sector companies involved, the interested public, and researchers, because this relationship has not been studied yet. Although the study focuses on German experiences, we believe that the results could be relevant for many other countries.

Projectification is a phenomenon that describes the increase in number and importance of projects in an organization or a societal sector, which results in significant effects on organizational governance, structures, processes, and the culture of collaboration (Maylor et al. 2006). Various studies have shown that projectification has advanced significantly in the German economy. Projects already account for more than 40% of the total working time and economic value added (Wald et al. 2015b). However, it is also evident that the public sector in Germany lags with a little more than 20%, far behind the private sector in terms of projectification, and requires improvement in international comparison (Schoper 2018). What has not been studied so far, however, is the question of what effects this might have on the realization of projects. The point is that projectification is not just a number, but rather a particular way of embracing a series of dynamic and challenging changes, and designing and implementing them effectively for the benefit of society (Jensen et al. 2016). Megaprojects as well as infrastructure projects bring together numerous government agencies, organizations, and interested parties, all of whom must share a common understanding and act cooperatively, including those with regulatory power.

Discrepancies at the projectification level among key stakeholders may create challenges for the collaboration on projects and affect the outcomes.

With our research, we wanted to answer the question of what effects the lagging projectification in the public sector has on the realization of infrastructure projects. We focused on the context in Germany and the different degrees of projectification in the private versus the public sector. Based on our quantitative survey and comparable studies (e.g., Wald et al. 2015b), we were able to identify differences in the evolution of projectification in both sectors. Based on the insights gained as a supporter of the German Federal Government's Reform Commission for the Construction of Major Projects (BMVI 2015), we selected the example of the Berlin BER Airport to analyze the effects of a lagging projectification in the public sector.

We make three important contributions. First, to our knowledge, this is the first time in research that illustrates the consequences of lagging projectification in a sector on the realization of projects. Second, we provide recommendations for practical action on how, in such cases, the leveling of projectification can be achieved by collaboratively partnering in such projects; and third, we make research propositions for future studies in this context.

Subsequently, key findings of the literature on the topic of projectification are elaborated along with insights into the context of our research. This is followed by a brief outline of the methodology applied and the results obtained through our analysis. Finally, these findings are discussed with their limitations, research propositions are identified, and a conclusion is provided.

2 Projectification – evolution from the organizational to the societal level

The term projectification first appeared in the literature in connection with the increasing importance of projects and the concomitant changes at the automobile manufacturer Renault (Midler 1995). These changes affect the management of the temporary projects and the roles and functions involved, and above all the permanent logic of the remaining organization. Projects are dynamic per se and require a high level of creativity and learning ability. On the other hand, the specialist departments are focused on stability and specialization. A "double loop" learning takes place (Aubry and Lenfle 2012). The entire organization continuously develops and thus improves its competitive position.

Projectification of an organization looks less at the realization of individual projects and more at what effect the realization of a large number of projects has on the governance, structure, processes, and culture of the organization concerned, as well as on the institutional context (Morris and Geraldi 2011). In the more than 25 years since the phenomenon of projectification was described by Midler in the context of product development in the automotive industry, it has been continuously developed and applied to other areas of society (Kuura 2020). Jalocha (2019) speaks of projectification at various societal levels: micro-level (individuals), meso-level (organizations), macro-level (industries and sectors), mega-level (countries, supra-national organizations), and meta-level (transformation of global social structures). As one reason for an increasing projectification, it is mentioned that in a "rapidly changing and increasingly turbulent and uncertain environment they face today, organizations are finding that some form of project organization is better suited to the kind of one-off or temporary problems and opportunities that they have to deal with" (Maylor et al. 2006, p. 664).

However, despite the widespread adoption of projects in many organizations, industries, or the economy, only a limited number of studies determine the extent of projectification (Wald et al. 2015a). In a pioneering study by the German Project Management Association (GPM), the share of project-based work in relation to total working hours was used as a metric to determine the extent of projectification in the economy or in individual economic sectors (Wald et al. 2015b). It was found that in 2013, the year in which the study was carried out, the share of project-based work in the German economy already exceeded one-third of the total working time and would increase by an additional annual rate of almost 3% in subsequent years.

Meanwhile, countries such as China, Croatia, Norway, Iceland, Italy, and South Africa have adopted this approach and also conducted research on the projectification of the economy (Schoper 2018). In this context, the share of project-based work in relation to the total working time is in the range of 30–50% for all countries. Still, it varies depending on the respective economic sectors and the economic development of the country, as well as the economic governance arrangement. Concerning the projectification of the economy in Croatia, the following is stated: "High projectification in a smaller country could be explained by needs for growth, change and development, which is typical for countries of any profile. It is also sure that globalization and latest EU membership also pushed projectification in many smaller countries due to EU project co-funding programs" (Radujkovic and Misic 2019, p. 50).

In all the countries surveyed, projectification is the most advanced in the construction industry. The share of project-based working time is between 74% (Croatia) and 85% of total working time (China). When analyzing the figures, it is noticeable that the projectification in the public administration in Germany, with 17.8% in 2013 (and 21.4% predicted for 2019), differs significantly from the corresponding share in Croatia at 37% found in 2018. This can probably be explained in the case of Croatia by the significant role and influence of the public sector on the national economy and the share of European Union (EU) co-financing of projects implemented through the public institutions. Nevertheless, all the studies on projectification mentioned above (Ou et al. 2018; Schoper 2018; Radujkovic and Misic 2019) confirm that the projectification of the public sector is significantly lower in most countries than the average in the economy of the respective country. Moreover, while the survey dates of the studies vary (see Table 1), a comparison of the projectification of the public sector with the construction industry shows that the figures diverge significantly between the two. In the case of Germany, this becomes particularly clear.

Few studies to date have looked at the economic and societal effects of an increasing projectification. Building on figures from the German economy, Henning and Wald (2019) come to the conclusion that the consequences of project work compared to non-project work are visible at the macroeconomic level and have predominantly positive effects, e.g., on innovation capacity, employment figures, and income, which in turn leads to shifts in the economic structure or the importance of individual sectors. The authors emphasize that "projects represent an adequate form of organizing for innovation, which in turn is key for growth and competitiveness" (Henning and Wald 2019, p. 817). The continuous sequence of innovative projects in distributed value networks establishes the project economy (Nieto-Rodriguez 2021), and above that, a project society (Lundin et al. 2015). "Project entrepreneurs form core teams with particular clients and service providers and establish sequences of related projects thereby forming collaborative paths" (Manning and Sydow 2011, p. 1369). This often leads to paradoxical tensions, depending on the level of development of the organizations involved in the realization of projects. DeFillippi and Sydow (2016), for example, report paradoxical tensions in project networks related to the disparities in the understanding and governance of temporary projects in the participating organizations compared to the persistent routine tasks that often still dominate.

Tab. 1: Data on projectification by countries, measured by the share of project-based work in relation to total working hours (Ou et al. 2018, p. 54; Radujkovic and Misic 2019).

Country/year of study	Projectification (%)		
	Public sector	Economy average	Construction industry
Germany/2013	17.8	34.7	80.0
Iceland/2014	33.3	27.7	80.0
China/2017	34.0	42.7	85.0
Croatia/2018	37.0	33.0	74.0

Society is also affected by the projectification in the economy and other areas. Political initiatives, plans, and events are realized in the form of projects and impact the organizations and people involved (Lundin 2016). Taking a broader view, the projectification on the societal level can be seen as "processes of invoking projects as habitual, legitimate and performative responses" (Packendorff and Lindgren 2014, p. 10), and projects together with project management are perceived as ideal and quite usual in societal life. "More and more individuals, in work and everyday life, as well as collective actors such as firms, governments, and non-governmental organizations, are speaking and thinking in project terms" (Lundin et al. 2015, p. 199). Projectification affects all levels of society, from communities (Fred 2015), through the work of public administration and governments (Kwak et al. 2014), to that of the EU (Godenhjelm et al. 2015).

Projectification has driven the project world into a new dimension. It started with individual projects and the need to manage them, inspired by more effective execution. Then the focus evolved to appropriate grouping projects into programs and portfolios and linking them to approved strategies driven by overall objectives generating more significant value. In both cases, projects were appropriate tools to address new ideas and current, temporary needs or problems. This is a proven bottom-up approach that has also been the subject of recent projectification studies (Schoper et al. 2018). However, projectification is much more than aggregation or a tool (Wagner et al. 2021). This will usher in a third era in the project world, where projectification serves society to balance development and change, working more from the top-down. In this scenario, where the public sector has significant responsibility for the development of society, a backlog in projectification is a crucial problem. The public sector should therefore even take a leading role in projectification and steer it in the right direction through dedicated support, creating an open mind, and providing meaningful governance.

3 The context for the study

The Federal Republic of Germany is located in the center of Europe and is the most populous member state of the European Union with more than 83 million inhabitants, a gross domestic product (GDP) of 3.3 trillion euros, and a robust economy.

3.1 The German economy and construction industry

"The German economy has great innovativeness and a strong focus on exports to thank for its competitiveness and global networking. In high-selling sectors, such as car-making, mechanical and plant engineering, the chemicals industry, and medical technology, exports account for well over half of total sales" (Schayan 2021). A share of 11.6% of the GDP is generated in the construction industry with 2.57 million employees. Investments in the construction sector and employment figures have risen slightly for years. As in the economy as a whole (Schlömer-Laufen and Schneck 2020), the construction industry is dominated by small and medium-sized enterprises. More than 80% of the value-added in this sector is generated by companies with fewer than 200 employees (Weitz 2021). "The German Mittelstand is at the forefront of a modern management model that builds flatter, innovative, and networked enterprises. They develop a high degree of specialization and possess an extreme focus on the wishes of global customers" (Parella and Hernandez 2018, p. 16).

Although the economy in Germany has picked up again after the setbacks during the pandemic in 2021, supply bottlenecks for materials, rising energy prices, and labor shortages are currently preventing a further recovery to pre-pandemic levels. Even though the new government will maintain budgetary discipline, it has announced additional spending in education, infrastructure, and climate protection (Bundesbank 2021), which is a positive sign for construction.

3.2 Public administration in Germany

Germany is a federally structured nation with 16 states that enjoy a relatively high degree of independence. "The close links between the federal states and central government is unique, resulting in the state governments having numerous opportunities to play an active role in central government policy" (Schayan 2021). Due to the federal structure of the state, public administration also comprises three levels: the national level, the state level, and the local level. Although the last of these is part of the state administration, they can organize themselves independently through bylaws and implement statutory ordinances (Sommermann 2021). A unique role in the civil service is played by the Federal Administrative Office Bundesverwaltungsamt, which reports to the Federal Ministry of the Interior Bundesministerium des Innern and provides services for all ministries and the entire civil service (von Knobloch 2021). For example, the Federal Administrative Office plays a vital role in digitizing the administration. Still, its President is also a significant participant in the action program "Shaping Germany's Future with Projects" of the GPM. The program comprises representatives from the federal government, the states, and local authorities, which aims to clarify what contribution project management can provide to maintaining Germany's future viability (GPM 2021). However, there is constant criticism of how little the public administration in Germany is capable of reform. For example, the pandemic has revealed the urgent need for digitalization and modernization of public administration in Germany (Wegrich 2021).

3.3 Infrastructure projects

Sparked by the German reunification in 1990, Germany's infrastructure has been systematically expanded and upgraded ever since. "The various transport and traffic infrastructure projects build bridges over the open inner-German borders between the old and new Federal States and Berlin. A total of nearly 40 billion euros has been invested in nine railroad projects, seven expressways, and one waterway project. To date, 98 percent of these projects have been completed or are in their final state" (Tiefensee 2018, p. 88). Yet, the public sector carried out only about 12% of construction projects in 2020. The vast majority was residential construction, with 61%, and the remaining 27% commercial (Weitz 2021).

An essential instrument for developing the infrastructure in Germany is the Federal Transport Infrastructure Plan (FTIP). The first edition of the FTIP was published in the wake of reunification in 1992, and after the second edition in 2003, the third edition was finally published in 2016 for the period up to 2030. It is concerned with the construction and structural maintenance of the federal transport infrastructure. "The FTIP comprises necessary capital maintenance investment and investment in replacement infrastructure as well as upgrading and new construction projects… the FTIP focuses on projects that have significant impacts on large areas and develop a significant capacity-enhancing and/or quality-improving

impact. The FTIP is the Federal Government's most important transport infrastructure planning tool" (BMVI 2016, p. 4). With the FTIP, more than 270 billion euros are spent in up to 2,000 projects and programs in Germany during the entire period. In the process, the federal level coordinates the evaluation of projects in terms of expediency and feasibility, creates legislative foundations, and coordinates the implementation of projects via the federal states, cities, and municipalities. Criticism regarding the FTIP is mainly directed at the inefficient selection, prioritization, and implementation of projects within the framework of public administration (Frey 2014) and the insufficient consideration of macroeconomic impulses in the planning of infrastructure projects (Walther and Haßheider 2018), as well as an overestimation of the possibilities for implementing the many projects (Fichert 2017).

Major infrastructure projects in Germany, especially those for which the public sector is responsible, have been criticized for years. "Large-scale projects, especially in infrastructure, are often finished late and over the initially planned cost. This has been subject to heated controversy over the alleged waste of public money in Germany. The Elbphilharmonie in Hamburg, the Berlin BER Airport and Stuttgart 21 are prominent examples" (Kostka and Anzinger 2016, p. 2). A Reform Commission for the Construction of Major Projects convened by the Federal Government called on all stakeholders to implement a fundamental culture change in the planning and delivery of large projects (BMVI 2015).

However, despite the criticism and recorded overruns, we have learned that the need for infrastructure projects in any society remains constant, or is even growing, due to ecological modernization (Haas 2020). So, nothing will stop these projects. They could be faster or slower, or more or less successful. And that's precisely the void that the public sector has a significant role to play in filling.

4 Research methodology

4.1 Research design

In order to answer our research question regarding the effects of lagging projectification in the public sector on realizing infrastructure projects, we focused on a quantitative survey on the projectification of society in Germany and compared the results with a previously conducted survey on the projectification of the German economy. To investigate the effects of different levels of projectification in the German construction industry and the public sector on infrastructure projects, we conducted an interpretive case study with a focus on governance. The nature of such research is based on understanding, describing a phenomenon with the researcher being internal in relation to the research object. "In such case studies, the researchers can embrace an insider's perspective on the research object being investigated and acknowledge the experiences of the informants and of the researchers themselves as elements of the research process" (Martinsuo and Huemann 2021, p. 419).

Our participation as subject matter experts in the German Reform Commission for the Construction of Major Projects between 2013 and 2015 allowed us to gain valuable insights into several major infrastructure projects, including the Berlin BER Airport, which we have analyzed here as a single-case study (Yin 2018). To validate our own findings, we have drawn on secondary qualitative data (Heaton 2008), which allowed us to triangulate all findings from the different sources (Maylor et al. 2017). In the context of case study research, "the investor's goal is to expand and generalize theories (analytical generalization) and not to enumerate frequencies (statistical generalization)" (Sharcia 2016, p. 3843). This form of inductive research enables the derivation of research hypotheses that can subsequently be tested deductively, hence supporting the inference of theoretical propositions (Eisenhardt and Graebner 2007).

4.2 Data collection and case selection

Our quantitative survey on the status quo of projectification of society in Germany with the most significant causes and effects was conducted between January 18, 2021, and February 26, 2021. All persons involved with projects in Germany in any way, whether as a member of a project team or in one of the following roles, were invited to participate in the survey. During this period, 200 people completed the questionnaire with a completion rate of 97%. Of these, almost 30% were from the industrial sector, 10% from the public sector, and the rest from other sectors of society (Wagner 2021). The data collected in this way were compared with a study by GPM on projectification in the German economy (Wald et al. 2015b) and other surveys on the phenomenon of projectification in the context of Germany (Hofmann et al. 2007; Rumpp et al. 2010), and these data were used for further analysis.

The Berlin BER Airport, a major public infrastructure project, is considered a downbeat example of a public sector project in Germany and is in the public spotlight due to the immense delays and the cost explosion.

Therefore, we have chosen this case to analyze in greater detail the effects of lagging projectification in the public sector in Germany on realizing infrastructure projects. For this purpose, we have drawn on a large number of publicly available reports, expert opinions, and publications (e.g., Kostka and Anzinger 2016; Müller 2020).

5 Analysis

In the first place, we show the different levels of projectification in the economy and the public sector in Germany with its evolution; then we provide an analysis of causes and potential consequences of lagging projectification in the public sector on realizing infrastructure projects, and reflect upon this using the example of the Berlin BER Airport.

5.1 Projectification of Germany economy versus public administration

The first evidence of an increasing projectification of the economy in Germany was published in 2007 by Deutsche Bank Research, which highlighted the following scenario: "In 2020, the 'project economy' delivers 15% of value creation in Germany (in 2007 the figure was about 2%). The 'project economy' refers to usually temporary, extraordinarily collaborative, and often global processes of value creation. It is closely intertwined with the traditional way of doing business and is based on mature information technologies. Germany's small and medium-sized enterprises benefit in particular" (Hofmann et al. 2007, p. 1). Three years later, an intra-company survey of the projectification shows that project-based work has permeated large parts of the organization in many companies in Germany and is still on the rise (Rumpp et al. 2010). Around three-quarters of the decision-makers surveyed stated that project-based structures had already been established in their company at the time of the survey and that around 37% of all work processes were already organized on a project basis. In particular, innovative issues, such as the introduction of new processes and procedures or the development of new products or services, are realized in the form of projects. In contrast, projects are used far less for administrative tasks, which primarily require reliable and fixed arrangements in a permanent framework. Projects, on the other hand, offer the advantage that project teams can act in a more solution-oriented manner, identify more closely with their goals and objectives, and work more independently. Operational project management is cross-departmental and brings together the know-how required to answer new questions from different internal and external areas in projects.

The GPM study on the extent of projectification in the German economy conducted in 2013 and published in 2015 also shows an increase in the proportion of working time spent on projects compared with total working time, namely from 34.7% in 2013 to 41.3% in 2019 (Wald et al. 2015b). The hypothesis of a further increase in projectification in the German economy could thus be confirmed, although the projectification varies significantly from sector to sector. Although "construction" accounts for only 4.6% of gross value added in Germany, the sector's projectification rate is with 80% by far the highest, followed by "business services," "trade/transport/hospitality," "manufacturing," and "information and communications." This is where the need for knowledge-intensive collaboration appears to be greatest for corporate success. By contrast, the "public services/education/health" sector follows with 17.8% at a considerable distance and has a great deal of catching up to do in terms of projectification (Wald et al. 2015b). Our own research on the extent of the projectification in Germany confirms the clear divide between the private and public sectors (see Table 2). It also indicates further growth of projectification in the coming years by almost 3% per annum (Wagner 2021).

5.2 Potential causes and effects of a lower projectification in the public sector

One of the biggest differences between actors from business and public administration is that the latter do projects, not for profit maximization or the best possible return on investment, but to use public money in the most effective way and to create value for society (Kwak et al. 2014). Furthermore, the public sector operates in an environment where a political agenda influences actions and goals, multiple stakeholders with their sometimes

Tab. 2: How societal sectors are impacted by projectification (Wagner 2021, p. 79).

Impact (from 0 = no impact to 7 = very high impact)	4.27	5.56	3.96	3.46	3.93
Sector	Society at large	Economy	Public administration	Leisure, sports, arts and culture	Civic engagement

conflicting interests and dynamics need to be taken into account, and much is aligned with the timing of the next election (Flyvbjerg 2017). The image of an independently acting project manager, who leads a temporary project dynamically and fluidly toward the intended goals, does not suit the image of public administration. "In these settings, projects are severely bounded and, as a result, the organization of projects involves considerable efforts to position the project within its institutional arrangements and among powerful political players" (Dille and Söderlund 2011, p. 480). Implementing projects can be attractive to politicians because it allows them to show that they are putting their political agenda into action and doing something for their constituents. However, time-limited projects do not necessarily fit the way of working in administration: "The public sector is traditionally associated with routine, hierarchy, and stability, whereas projects connote in principle a conflicting logic of discontinuity, flexibility, and innovation" (Hodgson et al. 2019, p. 6). Furthermore, the focus of a "homo projecticus" is more on performing activities that complete a pre-agreed scope in a specific timeframe or increments and less on setting that framing and creating stable conditions, as is more common in public administration (Jacobsson and Söderholm 2021).

Although projects and project management originated primarily in engineering and business management and developed to maturity there, it is slowly but surely spreading to public administration as well (Sjöblom 2009). Projects are used on the one hand to make ambitious political goals possible, such as infrastructure development (Fichert 2017), and on the other hand to reform the administration itself, e.g., through systematic digitalization and knowledge building (Ziekow 2021). However, the implementation of projects involving the public sector is repeatedly criticized, are significantly more expensive than planned, and also often take much longer: "manifold political interests are nested and hidden in the process… Key actors are interested in increasing performance requirements regardless of costs as well as in keeping the transparency of this cumulative process as low as possible" (Flyvbjerg et al. 2016, p. 41). Berlin's "BER Airport," the "Elbphilharmonie" at Hamburg, and "Stuttgart 21" are prominent examples of public projects that suffered from severe time delays, cost overruns, and controversial debates (Kostka and Anzinger 2016). As a supporter of the German Reform Commission for the Construction of Major Projects, we were able to gain deep insights into the causes and effects of these cases and to contribute to the final report and action plan for large projects. One of the causes mentioned is lack of collaboration: "Major projects are frequently characterized by mistrust and disputes rather than collaboration and cooperative partnerships" (BMVI 2015, p. 7). Most of the Reform Commission's recommendations point in the direction of strengthening the governance of major projects and improving the cooperation of all stakeholders with a focus on the role of public administration in forming the network of partners (Braun and Sydow 2019). A variety of dimensions of success need to be considered, allowing all stakeholders a chance to benefit, and this has to be taken into account from the very beginning (Elbaz and Spang 2018).

5.3 The example of the Berlin BER Airport

Shortly after the German reunification, a search began to identify a suitable location for a future airport that could meet the requirements of the new capital. In 1992, an agreement was finally reached on the expansion of the existing airport in Berlin-Schönefeld. At that time, the Germany Flughafen Berlin Brandenburg (FBB) was formed as the sponsor of this major project (Roth 2013). The City of Berlin and the State of Brandenburg are majority shareholders with 37% each, and the remaining shares are held by the Federal Government. The original plan to commission a general contractor and privately build the new airport was abandoned due to legal disputes during the tendering process and cost estimates of the private consortium that were deemed to be too high. "After abandoning the private tendering process, the board chaired by the mayor of Berlin, Wowereit, and the prime minister of Brandenburg, Platzeck, decided to build the airport under the owners' control… It was a megaproject 'squeezed' into an existing corporate governance framework designed for a going concern" (Müller 2020, p. 245). Yet, this was just one of many occurrences that ultimately led to a delay of 9 years and an increase in costs from the original 2.4 billion to almost 6 billion euros today.

In several respects, the Berlin BER Airport is an illustrative example of how divergent projectification levels between private industry and the public sector can cause governance and implementation-related problems in large-scale projects. Corresponding lessons learned have been discussed not only by the aforementioned German Reform Commission for the Construction of Major Projects but also by investigative committees and expert reports (e.g., Fiedler and Wendler 2015). The likelihood for failure, cost increases, or schedule delays in complex projects is high if adequate governance is not in place: "Megaprojects are qualitatively more complex and riskier, and therefore

require governance regimes that are different from those of more routine and less risky endeavors" (Miller and Hobbs 2005, p. 42). Governance in connection with projects comprises "the value system, responsibilities, processes, and policies that allow projects to achieve organizational objectives and foster implementation that is in the best interests of all stakeholders" (Müller 2009, p. 4).

A problem in public administration is the lack of expertise in tendering, commissioning, and supervising the construction companies involved in such a complex project, let alone the lack of in-house experience in project planning and management (Müller 2020). The supervisory board of the Berlin BER Airport which at the time was made up entirely of politicians, rejected the commissioning of a consortium of experienced private-sector companies on the grounds of cost because they did not want to abandon the self-imposed (but in retrospect completely unrealistic) cost and schedule targets. This effect, known in the literature as "optimism bias" (Flyvbjerg 2021), can often be observed in politically motivated decisions. Political influence was also decisive for the large-scale project, from the decision on the location to the construction planning and the division of the construction lots. The regional parliaments of Berlin and Brandenburg, for example, wanted to strengthen regional businesses and secure the loyalty of voters. "Breaking the project up into multiple lots in 2007 made it more complex and costlier and resulted in significant delays. The managing and controlling process for the new airport was thus compromised from the outset" (Müller 2020, p. 254).

In the course of the project, there were always opportunities to take countermeasures from within the project itself through parliamentary inquiries or external expert opinions. However, the Supervisory Board had no expertise in monitoring such a major project with the corresponding risks: "All in all, ignorance and unfounded optimism of sponsors and the airport's management trumped thoughtfulness and appreciation of risk. The possibility of failure was not taken seriously… Adequate time and cost contingencies were not included, resulting in cost-driven decision making that put the entire project on a slippery road" (Fiedler and Wendler 2015, p. 44). The German Reform Commission for the Construction of Major Projects has therefore strongly advocated bringing more third-party expertise into major projects, such as the Berlin BER Airport, regularly monitoring cost and schedule performance and risks according to recognized industry standards, and ensuring greater transparency about the real status of the project. Furthermore, collaborative planning tools, such as Building Information Modeling (BIM), are to be given greater consideration in the realization of public projects, as this is state-of-the-art in privately realized projects or other industry sectors (Wagner 2020).

Since the public administration is primarily accustomed to spending annual budgets and paying less attention to the profitability of the investment and the short-term liquidity and long-term debt ratio of the company, risks also exist here in the case of large projects. "Only after the delayed opening in 2012 did the board elevate the Chief Financial Officer to the management board… Project controlling and project documentation was subject only to self-regulation… Financial control was initially lacking" (Müller 2020, p. 256). Unthinkable in a privately owned project, the three shareholders of BER Airport assumed a 100% guarantee for the total debt of initially 2.4 billion euros. Loans guaranteed by the public sector are virtually risk-free for the lender. Moreover, they are exempt from the provision of equity capital under banking regulations. "As a result, the feasibility of the project, the design of a robust project delivery governance including customary checks, and the typical contractual requirements of lenders that aim to avoid the cost and time overruns were of no economic interest to the lenders" (Fiedler and Wendler 2015, p. 29). However, this is what is now causing significant financial problems for FBB, as the airport's income during the pandemic has fallen far short of expectations, and it is also unclear whether the airport will be able to operate profitably in the future. Currently, the three shareholders, therefore, have to inject taxpayers' money on a large scale to save FBB from insolvency (Gemünden and Wolf 2020).

6 Discussion

The results of our analysis exemplify that the extent of projectification in the public sector in Germany lags significantly behind the economy and that this has implications for the realization of infrastructure projects. We have described how severe these effects can be by using the example of the Berlin BER Airport (During 2013). The lagging projectification in the German public sector has negatively affected the project, delaying the schedule by 9 years and exceeding the cost by 250%. Even today, the viability of the project is questioned. Research should delve more deeply into the relationship between the extent of projectification across sectors and its effects on realizing projects, building on the first research proposition:

1. The degree of projectification in a sector affects the realization of projects with their schedule, costs, and overall feasibility.

This has also been observed for other projects (von Gerkan 2013), such as the "Elbphilharmonie" in Hamburg (Fiedler and Schuster 2015) or the mega project "Stuttgart 21" (Steininger et al. 2020) within the framework of the German Reform Commission for the Construction of Major Projects. It seems to be an issue that the public sector is predominantly organized according to a fixed model and based on predefined competencies, which correspond to the requirements of its ongoing tasks and duties. Projects, especially large and complex ones, require other mindsets, competencies, and organizational forms (Flyvbjerg et al. 2009). A lagging projectification of a particular sector means that these conditions are not met, which regularly leads to misunderstandings and problems, especially when the party that is less projectified has a stronger decision-making mandate.

As the example of the Berlin BER airport shows, the party with the most experience and expertise in planning and managing infrastructure projects should have significant influence, enabling learning gains for all other stakeholders. For example, the engagement of an experienced general contractor or planner could be considered, or an audit could be conducted by an independent institution before the approval of a major project, as is the case for public projects in Norway (Miller and Hobbs 2005). External experts could support the planning and supervision of a project. In general, close cooperation between the partners is advised. A recommendation of the German Reform Commission for the Construction of Major Projects underlines the importance of BIM for the success of complex infrastructure projects, serving as the basis for collaborative planning processes and integrated management (BMVI 2015). Private companies in the construction industry or specialized service providers have an essential role with their know-how. Research should address this linkage, bearing in mind our second research proposition:

2. A comparatively low degree of projectification in one of the sectors that participate in an infrastructure project must be considered for its successful management and governance.

In the case of the Berlin BER Airport, the client did try to award the project to a general contractor at an early stage, but when this failed initially, they took over the tasks and managed them on their own. This was a missed opportunity to make external expertise from the private sector available for the project and assume joint planning and management responsibility. The German Reform Commission for the Construction of Major Projects highlights in their report that a collaborative partnership approach is suitable for the successful delivery of major projects. Furthermore, it helps to align the projectification level of the two sectors through the exchange of experience and strengthening governance in complex infrastructure projects.

In this context, the integrated and partnership-based collaboration approach among the involved parties in complex projects recently gained popularity (Walker and Rowlinson 2020). For example, in the last decade, the "Integrated Project Delivery (IPD)" approach has gained acceptance in Anglo-Saxon countries as an alternative approach for complex projects. It has been shown to significantly improve schedules, costs, and quality (Pease *et al*. 2019). The approach is based on a mutually beneficial contract that creates a collaborative and innovative environment and focuses on value. All delivery partners are involved early in the project set-up and planning, helping with their expertise to improve the project delivery continuously. The participants, i.e., both client and contractors, openly share their experiences and jointly improve how the project is managed by working together on a project. This helps the project and facilitates the parties' projectification (Fiedler 2018). With the help of our third research proposition, researchers could undertake to investigate this connection:

3. Collaborative partnership in complex projects facilitates the convergence of the projectification levels and improves the governance of such projects.

This research opens up interesting new perspectives that can be used, for example, to link the degree of projectification of a societal sector to the project management or project success. Various studies on the projectification of economy indicate that the importance of individual sectors varies from country to country and may thus account for a relative competitive advantage or disadvantage. The example of Germany indicates that the lagging projectification of the public sector is a clear disadvantage when it comes to realizing complex infrastructure projects and that all parties involved should take action. In times of significant societal challenges and limited financial and other resources, it is necessary to design the implementation of projects as effectively and efficiently as possible, because otherwise, the funds will be lacking elsewhere. Our fourth and final research proposal therefore is:

4. The public sector will only be capable of meeting the challenges of the future if it systematically advances the projectification.

With all of the above research confirming a significant share of projects in the economy and society as a whole and forecasts of potential future growth trends, it is necessary for the public sector to systematically advance its projectification level (Fred and Mukhtar-Landgren 2019). In this regard, projectification is a cornerstone for the public sector to learn and adapt over time to change and contribute to the success and benefits of a wide range of projects as a "strong owner" with a wide range of project capabilities (Winch and Leiringer 2016).

Our research and knowledge gain is limited in that our example only highlights the specific situation in the country of Germany and on one particular example, the Berlin BER Airport. Therefore, our findings cannot be generalized and require further investigation of the context in additional cases. For example, the case of the Elbphilharmonie in Hamburg, which was also analyzed in the German Reform Commission for the Construction of Major Projects, could also be examined with regard to this connection. Since we see the possibility that similar experiences exist in other countries and that these should also be studied, we propose to conduct cross-national and comparative studies addressing this aspect.

The aim of our research was to point out the correlation. Further research should focus on the effects of different degrees of projectification in societal sectors and highlight the effects of realizing projects. In this context, international comparative longitudinal studies might help in gaining new insights. For the practice, it can be especially helpful to analyze the relationship between particular models of project delivery based on partnership and the systematic development of the projectification level within a sector and to provide guidance.

7 Conclusions

Our research focused on determining the link between lagging projectification in the public sector and the realization of infrastructure projects in Germany. This has become apparent because there have been several infrastructure projects in Germany implemented primarily by the public sector and suffered from severe deviations in terms of schedules, costs, and overall viability. The Berlin BER airport clearly shows that the lack of experience in realizing projects in the public sector impacted governance and, thus, the project's schedule and costs. Instead of involving private companies, which are more experienced in realizing major projects and are ahead of what concerns projectification, public sector organizations took the reins of action. It oriented the planning mainly to the political will of the project sponsors. In addition, there was a lack of expertise in the management and oversight of the project. Finally, a poor understanding of financial and accounting matters led to a shortfall in the public entity responsible for the project. Ultimately, the taxpayer must bear the consequences of the project.

In line with the findings of other research, our case study highlights the need for a partnership approach to both the planning and realization of projects. This brings the public sector's level of projectification closer to those of private companies. Still, it also allows both perspectives to be better integrated into the project, thus ensuring that schedules and costs are adhered to more effectively in the spirit of balanced governance. Ultimately, this should be in the interests of all parties involved, because we are all part of the society.

References

Aubry, M., & Lenfle, S. (2012). Projectification: Midler's footprint in the project management field. *International Journal of Managing Projects in Business, 5*(4), pp. 680-694.

BMVI (2015). Reformkommission Bau von Großprojekten. Endbericht. Available at https://www.bmvi.de/SharedDocs/DE/Publikationen/G/reformkommission-bau-grossprojekte-endbericht.pdf?__blob=publicationFile [accessed 18 December, 2021].

BMVI (2016). The 2030 Federal transport infrastructure plan. Available at https://www.bmvi.de/SharedDocs/EN/publications/2030-federal-transport-infrastructure-plan.pdf?__blob=publicationFile [accessed 18 December, 2021].

Braun, T., & Sydow, J. (2019). Selecting organizational partners for interorganizational projects: The dual but limited role of digital capabilities in the construction industry. *Project Management Journal*, *50*(4), pp. 398-408.

Bundesbank (2021). The current economic situation in Germany. Available at https://www.bundesbank.de/resource/blob/879652/23494ecbb6da96f19619abd640318460/mL/2021-11-ueberblick-data.pdf [accessed 12 December, 2021].

DeFillippi, R., & Sydow, J. (2016). Project networks: Governance choices and paradoxical tensions. *Project Management Journal, 47*(5), pp. 6-17.

Dille, T., & Söderlund, J. (2011). Managing inter-institutional projects: The significance of isochronism, timing norms and temporal misfits. *International Journal of Project Management, 29*, pp. 480-490.

During, R. W. (2013). *Lachnummer BER: Das Debakel um den Hauptstadtflughafen. Eine Chronik*. Rotbuch Verlag, Berlin, Germany.

Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal, 50*(1), pp. 25-32.

Elbaz, A. E. M., & Spang, K. (2018). Mapping the success dimensions of the infrastructure projects in Germany. *International Project Management Association Research Conference* 2017, UTS ePRESS, Sydney: NSW, pp. 1-13.

Fichert, F. (2017). Transport policy planning in Germany – An analysis of political programs and investment masterplans. *European Transport Research Review, 28*(9), pp. 1-12.

Fiedler, J., & Schuster, S. (2015). *Public Infrastructure Project Planning in Germany: The Case of the Elb Philharmonic in Hamburg*. Hertie School of Governance, Berlin, Germany.

Fiedler, J., & Wendler, A. (2015). *Public Infrastructure Project Planning in Germany: The Case of the BER Airport in Berlin-Brandenburg*, Hertie School of Governance, Berlin, Germany.

Fiedler, M. (ed.) (2018). *Lean Construction – Das Managementhandbuch. Agile Methoden und Lean Management im Bauwesen,* Springer, Berlin, Germany.

Flyvbjerg, B. (2009). Delusion and deception in large infrastructure projects: Two models for explaining and preventing executive disaster. *California Management Review, 51*(2), pp. 170-193.

Flyvbjerg, B. (2017). Introduction: The iron law of megaproject management. In: Flyvbjerg, B. (ed.), *The Oxford Handbook of Megaproject Management,* Oxford University Press, Oxford, UK, pp. 1-18.

Flyvbjerg, B. (2021). Top ten behavioral biases in project management: An overview. *Project Management Journal, 52*(6), pp. 531-546.

Flyvbjerg, B., Bruzelius, N., & Rothengatter, W. (2016). *Megaprojects and Risk. An Anatomy of Ambition.* Cambridge University Press, Cambridge, UK.

Fred, M. (2015). Projectification in Swedish municipalities. A case of porous organizations. *Scandinavian Journal of Public Administration, 19*(2), pp. 49-68.

Fred, M., & Mukhtar-Landgren, D. (2019). Agents, techniques, and tools of projectification. In: Hodgson, D., Fred, M., Bailey, S., & Hall, P. (eds.), *The Projectification of the Public Sector.* Routledge, New York, USA, pp. 189-208.

Frey, K. (2014). Inefficiencies in Germany's federal transport infrastructure plan. Available at https://thepep.unece.org/sites/default/files/2017-11/Inefficiencies%20in%20Germanys%20Federal%20Transport%20Infrastructure%20Plan.pdf [accessed 18 December, 2021].

Gemünden, H. G., & Wolf, K.-H. (2020). Der Einfluss des Flughafenprojektes BER auf seine Mutter-Organisation, die Flughafengesellschaft Berlin-Brandenburg (FBB). *PROJEKTMANAGEMENT AKTUELL*, Ausgabe 01/2020, pp. 54-64.

Godenhjelm, S., Lundin, R.A., & Sjöblom, S. (2015). Projectification in the public sector – The case of the European Union. *International Journal of Managing Projects in Business, 8*(2), pp. 324-348.

GPM (2021). Aktionsprogramm „Mit Projekten Deutschlands Zukunft gestalten". Available at https://www.gpm-ipma.de/know_how/aktionsprogramm.html [accessed 12 December, 2021].

Haas, T. (2020). From green energy to the green car state? The political economy of ecological modernisation in Germany. *New Political Economy, 26*(4), pp. 660-673.

Heaton, J. (2008). Secondary analysis of qualitative data. In: Alasuutari, P., Bickman, L., & Brannen, J. (eds.), *The SAGE Handbook of Social Research Methods,* Sage Publications, London, UK, pp. 506-519.

Henning, C. H. C., & Wald, A. (2019). Toward a wiser projectification: Macroeconomic effects of firm-level project work. *International Journal of Project Management, 37*, pp. 807-819.

Hodgson, D., Fred, M., Bailey, S., & Hall, P. (2019). *The Projectification of the Public Sector.* Routledge, New York, USA.

Hofmann, J., Rollwagen, I., & Schneider, S. (2007). *Germany 2020 – New Challenges for A Land on Expedition*. Deutsch Bank Research, Frankfurt, Germany.

Jacobsson, M., & Söderholm, A. (2021). An essay on 'Homo Projecticus': Ontological assumptions in the projectified society. *International Journal of Project Management,* pp. 1-5.

Jalocha, B. (2019). The European Union's multi-level impact on member state projectification in light of neoinstitutional theory. *International Journal of Managing Projects in Business, 12*(3), pp. 578-601.

Jensen, A., Thuesen, C., & Geraldi, J. (2016). The projectification of everything: projects as a human condition. *Project Management Journal, 47*(3), pp. 21-34.

Kostka, G., & Anzinger, N. (2016). *Large Infrastructure Projects in Germany. Between Ambition and Realities*. Springer, Cham, Switzerland.

Kostka, G., & Fiedler, J. (2015). *Large Infrastructure Projects in Germany. A Cross-sectoral Analysis*. Hertie School of Governance, Berlin, Germany.

Kuura, A. (2020). 25 Years of Projectification Research. Available at https://pmworldjournal.com/article/25-years-of-projectification-research [accessed 12 December, 2021].

Kwak, Y. H., Patanakul, P., & Zwikael, O. (2014). *Challenges & Best Practices of Managing Government Projects & Programs,* PMI, Newtown Square, USA.

Lundin, R., Arvidsson, N., Brady, T., Ekstedt, E., Midler, C., & Sydow, J. (2015). *Managing and Working in Project Society. Institutional Challenges of Temporary Organizations*. Cambridge University Press, Cambridge, UK.

Lundin, R. A. (2016). Project society: Paths and challenges. *Project Management Journal, 47*(4), pp. 7-15.

Manning, S., & Sydow, J. (2011). Projects, paths, and practices: Sustaining and leveraging project-based relationships. *Industrial and Corporate Change, 20*(5), pp. 1369-1402.

Martinsuo, M., & Huemann, M. (2021). Designing case study research. *International Journal of Project Management, 39*, pp. 417-421.

Maylor, H., Blackmon, K., & Huemann, M. (2017). *Researching Business and Management,* 2nd edn. Palgrave, London, UK.

Maylor, H., Brady, T., Cooke-Davies, T., & Hodgson, D. (2006). From projectification to programmification. *International Journal of Project Management, 24*, pp. 663-674.

Midler, C. (1995). Projectification of the firm: The renault case. *Scandinavian Journal of Management, 11*(4), pp. 363-375.

Miller, R., & Hobbs, B. (2005). Governance regimes for large complex projects. *Project Management Journal, 36*(3), pp. 42-50.

Morris, P. W. G., & Geraldi, J. (2011). Managing the institutional context for projects. *Project Management Journal, 42*(6), pp. 20-32.

Müller, J. (2020). A case study of the politics of airport construction – The new Berlin airport. In: Graham, A., Adler, N., Niemeier, H.-M., Betancor, O., Antunes, A. P., Bilotkach, V., Calderón, E. J., & Martini, G. (eds.), *Air Transport and Regional Development Policies*. Routledge, Milton Park, UK, pp. 239-310.

Müller, R. (2009). *Project Governance.* Gower, Farnham, UK.

Nieto-Rodriguez, A. (2021). *Harvard Business Review Project Management Handbook.* Harvard Business Review Press, Boston, USA.

Ou, L., Hsiung C., & Wang Y. (2018). Projectification in China: A comparative study of projectification between China and

European Countries. In: Schoper, Y. (ed.), *Project Management and its Impact on Societies – Proceedings of the 6th IPMA Research Conference in Rio de Janeiro*. IPMA, Amsterdam, Netherlands, pp. 37-58.

Packendorff, J., & Lindgren, M. (2014). Projectification and its consequences: Narrow and broad conceptualization. *South African Journal of Economic and Management Sciences, 17*, pp. 7-21.

Parella, J. F., & Hernandez, G. C. (2018). The German business model: The role of the mittelstand. *Journal of Management Policies and Practices, 6*(1), pp. 10-16.

Pease, J., Cheng, R., Allison, M., Ashcraft, H., & Klawans, S. (2019). *Integrated Project Delivery. An Action Guide for Leaders*. Integrated Project Delivery Alliance, Alberta, Canada.

Radujkovic, M., & Misic, S. (2019). Projectification of economy on a smaller country: A case from Croatia. *The International Journal of Business Management and Technology, 3*(2), pp. 44-51.

Roth, M. (2013). *Der Hauptstadtflughafen: Politik und Missmanagement. Ein Insider berichtet*. zu Klampen Verlag, Springe, Germany.

Rump, J., Schabel, F., Alich, D., & Groh, S. (2010). *Betriebliche Projektwirtschaft. Eine Vermessung*. Hays, Mannheim, Germany.

Schayan, J. (2021). Facts about Germany. Available at https://www.tatsachen-ueber-deutschland.de/en/germany-glance [accessed 12 December, 2021].

Schlömer-Laufen, N., & Schneck, S. (2020). Data for *Mittelstand* companies in Germany at the IfM Bonn. *Journal of Economics and Statistics, 240*(6), pp. 849-859.

Schoper, Y. (ed.) (2018). *Project Management and its Impact on Societies – Proceedings of the 6th IPMA Research Conference in Rio de Janeiro*. IPMA, Amsterdam, Netherlands.

Schoper, Y., Wald, A., Ingason, H. T., & Fridgeirsson, T. V. (2018). Projectification in western economies: A comparative study of Germany, Norway and Iceland. *International Journal of Project Management, 36*, pp. 71-82.

Shareia, B. F. (2016). Qualitative and quantitative case study research method on social science: Accounting perspective. *International Journal of Economics and Management Engineering, 10*(12), pp. 3839-3844.

Sjöblom, S. (2009). Administrative short-termism – A non-issue in environmental and regional governance. *Journal of Environmental Policy & Planning, 11*(3), pp. 165-168.

Sommermann, K. P. (2021). Constitutional state and public administration. In: Kuhlmann, S., Proeller, I., Schimanke, D., & Ziekow, J. (eds.), *Public Administration in Germany*. Springer, Cham, Switzerland, pp. 17-33.

Steininger, B. I., Groth, M., & Weber, B. L. (2020). *Cost Overruns and Delays in Infrastructure Projects: The Case of Stuttgart 21 – Working Paper*. Royal Institute of Technology, Stockholm, Sweden.

Tiefensee, W. (2018). "Rebuilding Regions – Die deutsche Wiedervereinigung als infrastrukturelle Aufbauleistung/Rebuilding Regions-German Reunification as an Infrastructural Challenge". In: Architekten, G., & Birthler, M. (eds.), *Unbuilding Walls: Vom Todesstreifen zum freien Raum/From Death Strip to Freespace*. Birkhäuser, Berlin, Germany, pp. 82-89.

von Gerkan, M. (2013). *Black Box BER: Vom Flughafen Berlin Brandenburg und anderen Grossbaustellen – Wie Deutschland seine Zukunft verbaut*. Quadriga Verlag, Köln, Germany.

von Knobloch, H. H. (2021). The federal administration of interior affairs. In: Kuhlmann, S., Proeller, I., Schimanke, D., & Ziekow, J. (eds.), *Public Administration in Germany*. Springer, Cham, Switzerland, pp. 81-90.

Wagner, R. (2020). EPC 4.0: The quest for reducing CAPEX in EPC projects. *Organization, Technology and Management in Construction, 11*, pp. 2245-2255.

Wagner, R. (2021). The impact of institutions on the projectification of society. Doctoral dissertation, Alma Mater Europaea ECM, Maribor, Slovenia.

Wagner, R., Huemann, M., & Radujkovic, M. (2021). The Influence of Project Management Associations on Projectification of Society – An Institutional Perspective. *Project Leadership and Society, 2*, pp. 1-13.

Wald, A., Spanuth, T., Schneider, C., & Schoper, Y. (2015a). Towards a measurement of 'projectification': A study on the share of project work in the German Economy. In: Wald, A., Wagner, R., Schneider, C., & Gschwendtner, M. (eds.). *Advanced Project Management (Vol. 4): Flexibility and Innovative Capacity*. GPM, Nuremberg, Germany, pp. 18-36.

Wald, A., Spanuth, T., Schneider, C., Futterer, F., & Schnellbächer, B. (2015b). *Makroökonomische Vermessung der Projekttätigkeit in Deutschland*. GPM, Nuremberg, Germany.

Walker, D. H. T., & Rowlinson, S. (eds.) (2020). *Routledge Handbook of Integrated Project Delivery*. Routledge, Milton Park, UK.

Walther, C., & Haßheider, H. (2018). Bundesverkehrswegeplanung. In: Akademie für Raumforschung und Landesplanung (ed.), *Handwörterbuch der Stadt- und Raumentwicklung*. Akademie für Raumforschung und Landesplanung, Hannover, Germany, pp. 337-347.

Wegrich, K. (2021). Is the turtle still plodding along? Public management reform in Germany. *Public Management Review, 23*(8), pp. 1107-1116.

Weitz, H. (2021). The German construction industry. Available at https://www.bauindustrie.de/fileadmin/bauindustrie.de/Zahlen_Fakten/Facts_and_Chats_in_English/The_German_Construction_Industry_01.pdf [accessed 12 December 2021].

Winch, G., & Leiringer, R. (2016). Owner project capabilities for infrastructure development: A review and development of the "strong owner" concept. *International Journal of Project Management, 32*(5), pp. 271-281.

Yin, R. K. (2018). *Case Study Research and Applications. Design and Methods*. Sage Publications, Thousand Oaks, USA.

Ziekow, J. (2021). Administrative procedures and processes. In: Kuhlmann, S., Proeller, I., Schimanke, D., & Ziekow, J. (eds.). *Public Administration in Germany*. Springer, Cham, Switzerland, pp. 163-183.