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Mechanisms for protecting returns on private investments in public infrastructure projects

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ABSTRACT

Despite the widespread attention for the private financing of infrastructure projects, actual empirical work on financing public-private partnerships remains limited. Especially the topics of return on equity and lenders' cash flow control in relation to uncertainty are under-researched. The aim of this paper is to investigate and discuss the mechanisms applied by private financiers of infrastructure projects to protect their returns on investment. Using semi-structured interviews, the qualitative viewpoints of infrastructure financiers and their consultants on infrastructure investment are examined. The findings identify nine control mechanisms that financiers apply, including a range of asset and risk diversification portfolio strategies for their infrastructure investments, and reveal that they depend on governance mechanisms relating to the project environment, relations, knowledge and expertise. Hence, this study provides a better understanding of the actions and mechanisms applied to protect a return on infrastructure investments that leverage partnering strategies between public authorities and private investors in public infrastructure projects. This contributes to the debate on project financing under uncertainty and its implications for project governance in public private partnerships.

1. Introduction

The term infrastructure generally covers all physical assets, equipment, and facilities of interrelated transport and energy systems and the necessary service providers, together with the underlying structures, and accompanying organizations and business models, rules, and regulations, which are used to offer certain specific commodities and services (Weber et al., 2011; Leendertse & Arts, 2020). Traditionally, most infrastructure investments have been financed by public funds (OECD, 2015; Sclar, 2015). Since the 1980′s, New Public Management has gained popularity as a public governance model and stimulated private involvement in public services, for example through public-private partnerships (PPPs), resulting in a trend of increasing private financing of public infrastructure projects (see for example Cui et al., 2018; Gamble, 2019; Opara & Rausa, 2019). Under this governance model, the role of the private sector has been extended to the provision of what are generally considered public services such as the design, financing, building, maintaining, and operating of infrastructure assets, and the delivery of associated services including the associated risk management (Agyenim-Boateng et al., 2017; Van den Hurk & Heuskes, 2017).

Alongside this trend, the need for new infrastructure continues to grow, for example due to investments related to sustainability and the growth of the world population (Hueskes et al., 2017). It is predicted that, by 2040, there will be a $94 trillion need for infrastructure investment globally (Global Infrastructure Hub, 2020). The G20 promote, in cooperation with major international organizations, worldwide infrastructure investments (OECD, 2018; Ougaard, 2018). All these initiatives are expected to substantially stimulate private financing into public infrastructure. It is, however, uncertain how the afore mentioned initiatives will be operationalized, especially given the effects of the current Covid-19 pandemic.

It is reasonable to expect that private financing of public and non-public infrastructure will continue under neoliberal economics and globalization (Gamble, 2019; Mackintosh, 2017). It is also to be expected that this financing will have a significant impact on the infrastructure market in the provision of equity and debt from providers, such as private equity, insurance companies, endowments, and private and

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public pension funds. Notably, infrastructure projects proved highly resilient during the recent Global Financial Crisis (GFC) in terms of risk-adjusted returns for investors (Gatti, 2018). Particularly in the aftermath of the GFC, many governments introduced policies and financial instruments to mitigate financial risks associated with infrastructure development, to continue to attract private finance to the infrastructure sector (Hussain & Siemiatycki, 2018; Li et al., 2017; Vecchi et al., 2017). Nevertheless, although this suggests that infrastructure is an attractive asset class for private investors, it does not automatically guarantee return on investment. Infrastructure projects are complex endeavours and include specific uncertainties and interdependencies among a large number of stakeholders (Benítez-Ávila et al., 2018; Verweij, 2015). Scholars such as Benítez-Ávila et al. (2018) and Denicol et al. (2020), Vecchi et al. (2017) increasingly stress that project complexity and inappropriate risk transfer may lead to deleterious consequences, such as significant disputes, the termination of contracts or even the bailout of private operators. Despite this debate, governments around the world continue to embrace private infrastructure finance (see, for example, Liu et al., 2017; Osei-Kyei & Chan, 2017), because, public funds in most countries do not seem meet the government's ambition for infrastructure development (Hodge et al., 2017).

There is a burgeoning body of literature in the project management field on financing PPP approaches for the delivery of infrastructure. Moreover, aspects related to public governance, private investment, and the related risk allocations in PPPs have received growing academic attention over recent decades (see for example Keers & Fenema, 2018; Wang et al., 2019). Cui et al. (2018) and Hodge and Greve (2018) even claim that governance and project finance should be fundamental topics in infrastructure PPP research. This links to the recognition that in PPPs, a project's cash flow must ensure a return on investment and debt coverage over a long period of time. Although the protection of project cash flows against risk and uncertainties is a central issue for financiers in PPPs (Owolabi et al., 2019; Wang et al., 2019), the actual mechanisms that financiers apply to protect their return on investments and/or to control cash flow in practice have not yet been well assessed.

Only a few researchers have discussed financiers' securitization strategies in relation to risk allocation and project complexity. Most of this literature on risk allocation only identifies success criteria for PPPs. A few researchers have, however, discussed how financiers approach project complexity and uncertainty to avoid loss of revenue. Wang et al. (2019), for example, addressed the relationship between risk allocation and private investment in complex PPPs and indicated that less risk can attract more private investment and that a high level of governance reduces the negative influence of risk assumed by private partners. Further, much of the literature focuses on how risks should be allocated and transferred to the private parties but fails to elaborate on the management of uncertainty after allocation. In this context, Demirel et al. (2019), for example, showed that to deal with uncertainty during the post-contract phase in a transport-related PPP project that it was necessary to complement the formal contract rules with social mechanisms. This shows the need for research on the relation between project financing and risk allocation in infrastructure projects.

Despite many studies having focus on the governance or relationships between public clients and project companies in the management of risks, few scholars have questioned on the role of financiers in risk and uncertainty control, or the interactions between parties involved. This is of importance since financiers can truly moderate the relationships between public clients and project companies. For instance, Owolabi et al. (2019) showed how risks can be packaged in a bankable form to secure the confidence of project financiers in PPP projects. Other studies have focused on the evaluation of project returns and equity optimization but ignore the interaction between project governance and private investment control. For example, Feng et al., (2017) developed an optimized equity model for the financial viability of infrastructure projects with host governments offering public funds for Special Purpose Vehicles (SPVs). Lu et al. (2019) proposed a PPP Asset Based Security as an alternative infrastructure financing model to acquire funding from institutional investors, while Li et al. (2017) elaborated the use of project bonds and a credit default swap in infrastructure financing under public-private partnerships.

In addressing the above-mentioned gaps in literature, the aim of this paper is to investigate and discuss the mechanisms that are applied by private financiers of infrastructure projects to protect their returns. It focuses on the following three research questions: 1) How do financiers approach risks and uncertainty when investing in infrastructure projects? 2) How do financiers protect their returns on investment? and 3) In what way does project governance influence the protection of financiers' returns? Answering these questions from a financial and transaction cost economics perspective will contribute to the debate on governance and financing in infrastructure projects in the context of public-private partnerships. This article proceeds as follows. First, the theoretical perspectives related to infrastructure financing are discussed in relation to project governance, including, risk and uncertainty concepts as used in investment decision making and the PPP capital structure and determinants of investment return protection for infrastructure projects. This is followed by a methodological section explaining our empirical approach, after which the results are presented relating to nine return protection mechanisms adopted by financiers in response to the uncertainties in infrastructure investment. The findings are then discussed in relation to the research questions. Finally, conclusions are formulated for how both researchers and practitioners could benefit from this research.

2. Theoretical insights into infrastructure project investment

2.1. PPP projects as economic transactions

Transaction Cost Economics (TCE) implies that economic institutions adapt their governance structures to achieve the lowest possible transaction costs and maximize profits (Biesenthal & Wilden, 2014; North, 1992). Williamson (1985) conceptualized the characteristics of transaction by focusing in particular on the behavioral assumptions of transactions (e.g. bounded rationality, opportunism) and the critical dimensions such as the role of uncertainty, the asset specificity, and the frequency of transacting for distinguishing among transactions. TCE is widely used in infrastructure projects (e.g. Chang, 2015; Sainati et al., 2020; You et al., 2018), also because mechanisms protecting return on infrastructure investments are directly related "costs of running the economic system" (Arrow, 1969, p. 48). Hence, it can be concluded that any issue that arises in the projects can be recasted as a matter of contracting and usefully examined from a TCE perspective (see also Williamson, 1985). You et al. (2018), for example, elaborated how the contract governs the relationship between uncertainty and opportunistic behavior in the construction industry and Chang (2015) identified risk-bearing capacity approach by using project lifecycle data (costs, risks and financial protections) employing TCE analysis.

Infrastructure projects are idiosyncratic, sunk investments. Joskow (1985) showed that in infrastructure projects, transactions costs can include costs of negotiating and writing contingent contracts; costs of monitoring contractual performance; costs of enforcing contractual promises; and costs associated with breaches of contractual promises. In order to minimize transactions cost, risk and uncertainty should therefore be taken into account when entering an infrastructure deal. TCE is particularly relevant for studying the governance of infrastructure PPP investments because control on the uncertainty can minimize transaction costs through contractual agreements and risk sharing mechanisms. According to Jin and Zhang (2011) risk allocation can be formulated as a contract problem; if a risk is improperly allocated and possible transaction costs may include extra costs for clients, contractors and investors due to uncertainty. A TCE perspective implicates that "*increasing the degree of uncertainty makes it more imperative that the parties devise a machinery to "work things out" since contractual gaps will be*

larger and the occasions for sequential adaptations will increase in number and importance as the degree of uncertainty increases" (Williamson, 1979, p. 254). More and more scholars and practitioners have become aware of the fact that PPP contracts are generally incomplete and a heavy investment in assets and complex projects (Hart, 2003; Jin & Doloi, 2008), mainly due to the impossibility of specifying every element ex ante in the context of a long-term partnership (Demirel et al., 2019). Contractual incompleteness sets the stage for ex post performance problems and imperfections (Joskow, 1985). This can lead to opportunism between the parties in the transaction that can increase costs or reduce revenues that will be obtained by the other party (Joskow, 1985; You et al., 2018). According to Williamson (1985), additional transaction-specific savings are adapted to unfolding events and periodic contract renewal agreement are reached. This poses a serious contracting dilemma and opens up the debate on the role of formal (contractual) and informal (relational) governance between public and private partners in infrastructure projects. Hence, to contribute to this debate we first explain how infrastructure can be considered as an asset investment class from a financial perspective and how financers according to literature protect their return on investment.

2.2. Infrastructure as an asset investment class

Williamson (1979) recognizes uncertainty as one type of transaction characteristics in the governance of contractual relations. This indicates that any investment decision is based on risk and uncertainty and a contract is aimed at protecting the return on investment. Hirshleifer (1965) defines an investment as the purchase of assets to generate future incomes through financial opportunities. Risk estimation and uncertainty are generally recognized as key elements in investment decision-making. In this context, Broadbent et al. (2008)) argue that where there is *no* possibility of placing a numerical probability on something occurring, the unclear future state is referred to as an 'uncertainty' rather than a 'risk'. That is, a risk involves the possibility of placing some 'calculable probability' on a future event occurring. Both risks and uncertainties might result in the poor performance of infrastructure projects and reduced returns on investment (Biais et al., 2016; Denicol et al., 2020) and may thus prevent the achievement of the primary objectives of the partnerships established to deliver these projects (Keers & Fenema, 2018).

Investors always take actions to protect their equity, for example by spreading their investment in portfolios. Stewart et al. (2019) describe that diversification and rebalancing of positions help to avoid disproportionate exposure to particular systematic and idiosyncratic risks. Fig. 1 schematizes the standard process for investing in assets. This indicates that infrastructure as an asset class can form part of the allocation strategy of private capital investors, alongside other assets such as stocks and bonds, and real assets like commodities or real estate. From within these groups, projects are chosen which reflect an envisioned return on investment given the expected performance of the assets and the associated risks and uncertainties.

Infrastructure investments can be characterized by high start-up costs, a long-term investment horizon, a slow rate of recovery, and a high degree of asset specificity (Wibovo & Alfen, 2013). Furthermore, Gatti (2018) relates the typical characteristics of infrastructure to typical goals of private investors: long-term assets with a long economic life cycle, low technological risk, provision of key public services, strongly inelastic demand, natural monopoly or quasi-monopoly market contexts, high entry barriers, regulated assets, frequently a natural hedge against inflation and stable, and predictable operating cash flows. Based on these characteristics, infrastructure can provide significant diversification benefits to the portfolios of investors. Portfolio diversification can thus be considered as an important control mechanism to protect investor returns (Bianchi et al., 2014; Oyedele et al., 2014; Thierie & De Moor, 2016). Additionally, infrastructure allows for further diversification between different infrastructure options such as sectors

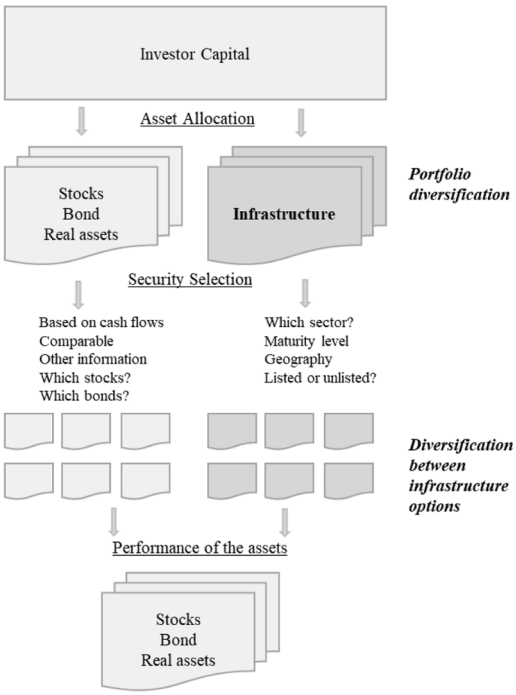

Fig. 1. Standard investment process adapted from Anderson (2006) and Panayiotou and Medda (2016).

(transportation, telecom, utilities), regions (e.g., Europe, Africa), maturity (greenfield or brownfield), and investment vehicle (listed or unlisted) (Panayiotou & Medda, 2016; Thierie & De Moor, 2016; Weber et al., 2011).

2.3. Infrastructure financing models

Two main models for the private sector financing of infrastructure have emerged in practice: the Regulatory Asset Base (RAB) model and the Project Finance Model in Public Private Partnerships (PPP) model. In the RAB model, private or corporatized state-owned companies act as the infrastructure manager: they own, invest in, and operate infrastructure assets. The infrastructure manager receives revenue from users and/or subsidies to fund its operations and recoup the investment costs (Makovšek & Veryard, 2016).

In the PPP model, the government tenders a contract for a single infrastructure project or sometimes a bundle of projects under a single contract. The contract gives the private consortium responsibility for all aspects of a project financing, delivery, maintenance, and operation for a longer period often spanning decades. The contract sets out how the consortium receives revenue: either from the government in the form of a periodic 'availability payments', and/or direct from users (Liu et al., 2017; Makovšek & Veryard, 2016). PPPs are usually financed through a project finance scheme, where a large portion of the investment is financed with debt in the form of syndicated loans or bonds. In a mix of debt and equity, debt is provided by lenders/banks and equity is provided by private sponsors, pure financial investors and industrial investors (Vecchi et al., 2021).

In terms of project finance, the future cash flows of the project must be sufficient to fund delivery, maintenance and operating costs, and debt service, and to yield shareholder returns (Garcia-Bernabeu et al., 2015; Sarmento & Renneboog, 2016). Gatti (2018) explained that project finance is basically a function of a project's ability to repay the debt contracted and remunerate the capital invested at a rate consistent with the degree of risk inherent to the venture concerned (see also de-Biasio & Murray, 2017). Sectors vary from each other on risk return. Morgan (2015) calculated that the average expected return on investment for

social infrastructure PFIs is 5–8%; for contracted power generation 6–8%; for regulated utilities 8–10%; for toll roads 8–12%; for airports 10–15%; for seaports 11–16%; for freight rail 12–16%; for telecommunication infrastructure 12–18% and for merchant power generation 14–20%.

2.4. Protecting the return on investments in infrastructure projects

To protect future returns in infrastructure projects, evaluation of potential risks and uncertainties is key. This can, for example, been done through a due diligence process provided by advisory experts (e.g. technical, legal, financial) as these are wholly engaged in transacting (North, 1992); the more complex the infrastructure process is, the more advisors will be engaged in coordinating and operating the system. Due diligence does not aim to eliminate risks and uncertainty, but to evaluate and set up control measures for the investor (Flybjerg, 2013; Yescombe & Farquharson, 2018). According to Yescombe and Farquharson (2018), typical aspects covered in an evaluation are: Can the project be completed on time and on budget? Do major subcontractors have the experience and financial capacity to support their obligations? Can revenues and operational expenditure (opex) be predicted with reasonable certainty? Will there be enough net cash flow from the project's operation be sufficient to adequately cover debt service adequately, and are the project economics robust enough to cover any temporary problems that may arise?

Risks can lead to undesired outcomes including in the provision of the services (because the facility is not completed on time) or the financial viability of the project (loss of revenue or increased costs) (Yescombe & Farquharson, 2018). Therefore, an appropriate proper allocation of risks is another key factor in the decision-making process to invest in an infrastructure PPP project (Garcia-Bernabeu et al., 2015; Mishra et al., 2015; Peda & Vinnari, 2019). Standardized project agreements have been developed to identify and allocate the main risks in infrastructure projects: generally classified as political, construction, operation, and financing risks (see, for example, the standard Rijkswaterstaat DBFM model in the Netherlands and UK HM Treasury PFI model). In line with the prospect theory (Kahneman & Tversky, 2013), Burke and Demirag (2017) found that infrastructure financiers generally are risk averse and in favor of risk transfer to sub parties in PPP projects. This asymmetric attitude in PPP infrastructure projects of investors behaving as risk seeking agents in the domain of losses and as risk averse agents in the domain of gains was also described by Wibowo and Alfen (2013) and Espinoza et al. (2020).

2.5. Governing risk and uncertainty PPP projects

Special Purpose Vehicles (SPV) are commonly used to support specific transactions in infrastructure projects, including public-private partnerships (Sainati et al., 2020). The SPV is usually a shell company that sub-contracts a project's tasks to related companies of the consortium members (De-Biasio & Murray, 2017; Demirag et al., 2015; Sainati et al., 2020). The capital drawn down by the SPV to pay transaction costs and construction is provided as a combination of equity from the SPV members and incurred debt from banks or bondholders (Hellowell & Vecchi, 2012). The SPV serves to mitigate risk for sponsors and for lenders (Garcia-Bernabeu et al., 2015; Sarmento & Renneboog, 2016) by delegating and managing risks on behalf of the financiers (Wang et al., 2019; Zwikael & Smyrk, 2015). Risks can be passed through a network of contracts from the SPV to subcontractors and so do not revert to the financiers (see Fig. 2) (Gatti, 2018; Sainati et al., 2020).

For both the equity investors and the lenders, the overall aim is to ensure that risk and uncertainty is retained by the contracting authority or passed on a back-to-back basis to subcontractors (Yescombe & Farquharson, 2018). The credit or loan agreement is the project finance artery and this controls the entire financing transaction and its security package for lenders (Gatti, 2018). It is the protection provided by this system which is activated if the project or financing does not function as expected.

According to (Madykov, 2015), direct agreement provisions with the contracting authority are an important mechanism to protect lender's rights by enabling the senior debt provider to step-in and take control of any project experiences difficulties (Demirag et al., 2012). Such a provision is usually for a limited timeframe the aim of giving the lenders the opportunity to rectify the default and avoid termination of the contract (World Bank, 2019). Despite all such measures, in the end, it is effective public governance and favorable institutional settings established by public authorities that are generally seen as an unconditional factor for successful completion of projects (see for example Benítez-Ávila et al., 2018; Keers & Fenema, 2018; Wang et al., 2019). Wang et al. (2019) found that higher level of public governance in the form of government effectiveness, regulatory quality, rule of law, and control of corruption, attracts more private investment. (Jones & Cozzi, 2016) go as far as to state that private investment would not be at adequate levels without complementary public investment and measures to mitigate risk such as grants and subsidies, credit enhancement tools, and direct provision of debt and equity. In line with Vecchi et al. (2017) and Wang et al. (2019), this would mean that a favorable institutional setting for PPP projects includes dedicated institutions and procedures and a clear regulatory

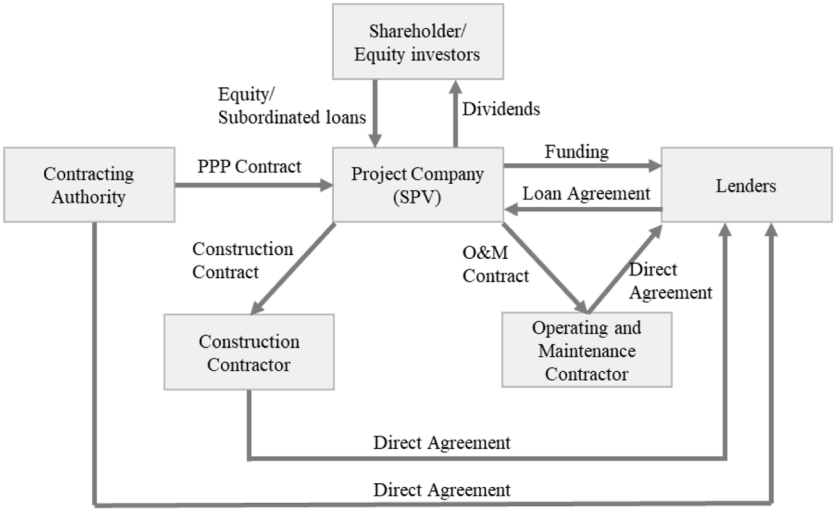

Fig. 2. SPV-model in PPP type of projects (adapted from World Bank, 2019).

framework.

According to Wu et al. (2017) investors generally safeguard their investments through two types of governance mechanisms: formal contracts and relationships. The formal governance focuses on contracting, includes legal relationships between the project's stakeholders. A collaborative type of governance between public and private partners can also provide a secure environment to financiers to receive returns and loan coverage. Demirel et al. (2019), for example, showed the importance of information flows between partners in dealing with uncertainty in the implementation of infrastructure projects since imperfect data can result in failure and an ineffectively financed infrastructure. Mandri-Perrot (2009) found that good quality data management will highlight any financial deviation from the original assumptions and is a key to controlling return on investment.

Last, but not least, building and operating infrastructure needs specific knowledge and expertise. According to (Almarri & Boussabaine, 2020), risk holders must have the necessary skills, knowledge and capacity to influence risk outcomes in a way that benefits the partnership. This suggests that mechanisms applied by private financiers of infrastructure projects to protect their returns probably consist of a diverse range of formal and relational structures. This study aims to empirically investigate the mechanisms that are applied by private financiers of infrastructure projects to protect their returns.

3. Research method

3.1. Data collection

To qualitatively obtain a deeper understanding of the practices associated with infrastructure investment, the viewpoints of infrastructure financiers and their consultants were gathered using 25 semi-structured interviews (Patton, 2005). A diverse group of actors in infrastructure investment was purposefully selected for our interviews (Brinkman & Kvale, 2015). The "IJ Global Investor" (IJ Global, 2019) database was used to select people to interview. This database contains infrastructure transactions from around the world and details of infrastructure projects by their investment. Access was granted by the first author to deals closed between 2017 and 2019.

The researchers initially selected representatives (heads of infrastructure divisions, directors, investment managers, CEOs, CFOs, and transaction advisors) of top global investors in infrastructure projects and advisors who were frequently involved in the closed deals. For practical reasons, the total number of interviews was restricted to 25 and interviewees were selected in such a way that all the above-mentioned categories were equally represented (Brinkman & Kvale, 2015). The selection (see Appendix 1) was based on the investor categories of the SPV structure as shown in Fig. 2: equity investors (referred to as 'E': private equity, institutional investors, construction companies); debt lenders (referred to as 'D': commercial banks, investment banks, development banks), and advisors (financial (FA), technical (TA), and legal advisors (LA)). Additionally, based on suggestions from the interviewees, expert financial analysts (A) were included in the sample.

The interviews were conducted in a semi-structured way (Patton, 2005). The first author conducted the interviews in the UK, Germany and in the Benelux in the period between 2017 and 2019. All the interviews were recorded and transcribed verbatim. The interviews were conducted in face-to-face meetings and telephone calls of about 1.5–2 h and divided into three parts. First, basic information about the interviewee was asked, i.e., their investment scheme and in which way they were involved in infrastructure investment. In the second part, their approach to risk and uncertainty and the actions they take to protect their return on investments were explored. This also included questions about 'How do you evaluate the risks?' and 'Can you please give an example how you ensure return on investment from an infrastructure investment?'. In the third part, the questions focused on how public governance, institutional settings and social factors influenced their investment decisions. This led to a rich dataset on the how financiers invest in infrastructure projects.

3.2. Data analysis

The analysis of all the data was done by way of coding initially based on the research questions and insights from the literature (deductive) and then further developed in iterative steps of analysis of the interview data (inductive). Analyzing the data from the semi-structured interviews, going back and forth while applying concepts from literature, distinctive categories of return protection mechanisms emerged. In our analysis, the first step comprised the identification of investment decision making under uncertainty. The resulting codes included several TCE elements, for example, 'attractive asset class', 'low volatility', 'hedge against market uncertainty', and 'diversification benefits'. From this first step, two types of control mechanism emerged from both literature and interviews: asset portfolio diversification and diversification between different infrastructure options. Then we looked further into the investment process and aimed to identify actions applied by financiers to ensure return on investment from infrastructure projects, for example, a PPP type. Codes in this step again included elements derived from our theoretical framework, such as 'risk transfer', 'due diligence', 'back-to-back principle', 'free SPV from risks', 'uncontrollable', 'standard contracts', 'direct contracts', 'cash flow control', 'lenders step-in right' etc. From this second step of the analysis emerged four types of control mechanisms from both literature and interviews: 'risk and uncertainty evaluation', 'risk allocation', 'financial knowledge', 'project experience' and 'data management'. In the final step, we focused on exploring mechanisms in relation to governance. This step included the following codes: 'collaboration between partners', 'relationships', 'subsidies' 'formal contracts'. From this step two types of mechanisms emerged: 1) public governance and institutional setting and 2) relational governance, leading to a total constellation of nine mechanisms that are used by private investors to ensure a return on infrastructure investment. Each of these mechanisms is listed in the next section on the findings.

4. Findings

4.1. Asset portfolio diversification

A dominant aspect in the data was that returns are best hedged against market uncertainty through the diversification of the investment portfolio by investing in multiple asset classes. "Uncertainty in financial markets has shifted our portfolio decisions to move our corporate financing to infrastructure financing. This is very important for us because by investing in infra we are not affected by the volatility of the stock markets" (E1). Infrastructure was considered an attractive class because it provides good performance for investors with a long term focus"infrastructure presents a low risk investment and a better performance in the long run compared to other asset classes" (E4). Infrastructure investments are typically tied to public goods, and so their revenues are less vulnerable to economic cycles or changes in monetary policy. Moreover, their revenues are often inflation linked, protecting the real returns on the investment.

Interviewees noted that especially after the 2008 GFC and 2009 Eurozone turmoil, equity investors embraced infrastructure when private debt became provident. They also regularly mentioned the influence of the Basel committee, a global standard setter for the prudential regulation of banks (BIS, 2011). As D2 explained: "After Basel III, the capital requirements for the banking sector changed, the basis points for private borrowing have decreased and the exposure of banks' lending has also been questioned under leverage and liquidity ratios. Since then, the escalation began for equity such as pension funds due to their long term investment strategies". This shift in investors character aligns with the long life character of infrastructure. Compared to other assets

infrastructure is characterized as 'illiquid', thereby attracting investors who "have a long-term mind set and take decisions based on the long-term stable returns on an asset, and who are paying more attention to long-term contracts which are regulated and indexed to inflation" (E2).

The above shows how investors are increasingly looking at infrastructure as investment because it seems an attractive diversifier in their investment portfolio among other asset classes to control market volatility.

4.2. Diversification between different infrastructure options

All the interviewees mentioned the large capital needed to realize infrastructure projects. "Up-front costs are high and there are only a few parties that can invest in infrastructure projects directly" (D3). As a consequence, most of the time, it is the same infrastructure investment companies taking part in infrastructure deals. One of the investors emphasized that "they are investing globally in sectors ranging from utilities to telecommunications. They especially look at the size of the investment" (E3).

In general, the interviews showed that investor decisions are based on the sector, region, maturity, investment type, and project conditions of the infrastructure, as well as the personal preferences of the investment managers. One of the interviewed investment managers listed their criteria for infrastructure investment as follows: "The infrastructure project needs to align with our business plan we set a business plan every year for the next three years: where do we want to invest, which sectors etc. Second, we look at the size of the investment, we won't invest under 20 million euros. Third, we look at the returns per sector and per geographical location, against minimum returns which we need to meet. Finally, we look at the risk profile and the network of the contracts. What risk profile does this individual project resemble?" (E5).

Geography came across in the data as a significant variable when deciding to inject private capital into infrastructure projects. In this, an important consideration is the country that investors are targeting for their investment. E3 commented that "we do comprehensive research on the projects and at the place they are located. We evaluate and line up the locations from high credit rating to low credit rating. Our philosophy is to invest in high credit rating, triple AAA, countries such as the Netherlands. Political stability, local regulations and the [country]'s extensive knowledge of and experience in infrastructure contributes to our engagements". One of the private equity investment managers argued that "their investment target is to invest in low credit rating countries where they have already invested in a lot of greenfield projects in emerging countries. Our expected return targets in emerging economies are higher than in the developed ones, due to political uncertainties and uncontrollable Forex (Foreign exchange) risk" (E5).

Another investment characteristic mentioned is the sector that investment managers prefer certain sectors. One of the investment managers stated that "the only way you can deal with black swans is to carefully diversify your infrastructure portfolio across sectors and in different regions. You cannot protect individual deals, but what you can do is protect your portfolio by making sure you are not filling it with similar types of deals in similar countries" (E6). Several investor managers mentioned that they have different risk return criteria for different infrastructure sectors: "Toll based transportation projects, such as roads, and demand-driven fiber projects can be riskier than a regulated wastewater collection plant, due to their cash flow volatility" (E4). "The EU target to decrease CO_2 levels, increases our interest in investing in renewable energy. Investing in Hydrogen infrastructure can be riskier; however, it can provide higher annual returns than regular airport infrastructure" (E6).

Interviewees regularly suggested that they took the phase of projects into account in their diversification strategy. E5, for example, explained that "The risk profile in the construction phase is higher than the operational phase in infrastructure projects. In the early stage of infrastructure development, they expect 15–20% return. For brownfield assets 8–15% would be acceptable".

This indicates that investors ensure a diversification of several characteristic of the infrastructure investments, such as the phase at which they become involved in an infrastructure, the location, the sector and the size of the investment, makes a quite difference for investors.

4.3. Risk and uncertainty evaluation

From a financier's perspective, it appears important to be able to predict possible changes in the global market while allocating capital. It seems, however, impossible to include all events in a statistical analysis of financial possibilities since "it is very difficult to value uncontrollable events in the financial models" (A2). According to most interviewees, uncertainty is both "unknown and uncontrollable": for example, "uncertainty has an impact wider than individual projects you are investing in" (E1). Although participants recognized that uncertainty has an effect, their approach to uncertainty and risk management is mostly project based and correlated with project returns. "If any unforeseen event occurs during the project (which it always does), the project agreement has to be on board to calculate compensation" (E7). "A project has to come with a certain return level, and that return level should be robust enough for unforeseen circumstances" (D5). Uncertainty is generally approached from a risk perspective and characterized as an exposure to loss. D4 gave the example of the uncertainty of delay due to unknown ground conditions that can be specified, quantified, priced and buffered as a risk in the financial model. FA1 mentioned that "in the financial model, for unexpected events an overall contingency is added to the project of around 10% of the capital expenditure".

When it comes to project financing, and particularly PPPs, rating agencies tend to provide ratings that result from calculating a range of qualitative and quantitative risk characteristics likely to affect the project outcomes. As A1 stated: "the risk models of our agency focus on expected losses, where a rating reflects the expected loss associated with contractually promised payments". According to some interviewees, these risk-quantification models used by rating agencies are very useful for the valuation of a project during their decision-making process. D1 explained that they "considered risk measures and ratings when investing in different geographies that we are not familiar with".

All the investment managers stated that they are in favor of having a proper due diligence process in order to understand projects better and to better assess risks during their investment decision process, hence, to guarantee returns on investment. It is common in the infrastructure sector to use third party independent advisors to carry out feasibility studies. Many investment managers (E1 to E9 and D1 to D5) mentioned that a variety of advisors - financial, technical, legal, insurance, tax etc. - had been assigned to infrastructure transactions. These advisors help financiers assess potential associated risks and can suggest mitigation measures related to the specific infrastructure project. Such assessments indicate whether a project is bankable or not and, based on this, financiers can decide whether to invest in a specific project. Here, E9 commented that "when a project is complex or highly uncertain, the advisor's role, especially the role of the technical advisor, is crucial and dominant. They are the ones influencing our decisions by identifying technical risks in areas where our knowledge is very limited". TA1 indicated that they "combine the technical and environmental knowledge of the specialists with operational, commercial and financial expertise to assess risks and opportunities in our clients' deals. This integrated approach allows us to diagnose and evaluate interrelated issues in the context of an overall transaction, mitigating risks, identifying opportunities, and realizing investment value".

According to TA2, advisor based assessments should at least include: 1) a technical assessment of the physical assets, their technical performance, operations and maintenance regimes, an organization review, a review of ICT systems, and an assessment of the threats to the operation of the business; 2) a business assessment of investment planning, historic

capex, suitability of a capex forecast and a business plan assessment; and 3) an environmental and health & safety assessment including a review of environmental management, potential risks, liabilities and issues and the safety record and procedures. Generally, a 'transaction team' will include financial, technical, legal, insurance, and tax advisors, and be led by a "mandated lead arranger". E9 said that "once a deal has been financially closed, some consultants -mainly technical advisors- stay on their role during the execution phase of the project. They monitor ongoing issues in order to protect the investments and returns of the financier". Monitoring was often mentioned in the interviews as mechanism to control risks and to follow the SPV's services during the construction and operation phases of infrastructure projects.

These results indicate that financiers approach risk as quantifiable and apply control mechanisms based on this quantification. Uncertainty is mostly approached as uncontrollable and avoided or neglected. Third party advisors seem often used by investors to support in their investment decisions by providing due dilegence. In addition, advisors provide consultancy during the project implementation.

4.4. Risk allocation

Generally, interviewees concurred that risks should be allocated to the party that can best manage them. Investors typically transfer risks to an SPV that then transfers them to subcontractors through a network of contracts. According to D3, "the idea behind the whole finance structure is to hedge all risks. We aim to transfer important risks from the SPV to EPC and O&M contractors on a back-to-back basis… it is to keep the SPV risk neutral. In the event of a non-performing, we can wait till the long stop date and use the option of termination. In this way, we can shield SPVs from any type of risk and guarantee future returns". Consequently, contractors employed for execution, maintenance, and operation "are accepting all the most important risks in the project agreement, such as agreeing high percentages of liquidated damages, in order to be in the deal" (TA3).

As Fig. 2 shows, a private partner signs a contract with the contracting authority to provide services through a project agreement and, at the same time, also enters into a separate Credit Agreement with Lenders. This Credit Agreement is "a loan agreement with the banks to raise a senior debt leveraged as 90:10 or 80:20″ (E8). The loan agreement includes several security agreements as a control mechanism. Further D2 stressed that, in infrastructure projects, "the first priority is payment of debt". A financial advisor (FA1) mentioned that "a loan agreement's key covenants are the mechanism used to protect debt return: such as, the borrower shall not prepay without the bank's authorization, the borrower shall not pay dividends unless the project presents risks in a period; the borrower shall maintain a reserve account at specific levels". To give an idea of the complexity of agreement networks E9 mentioned that they "are entering into more than 70 security agreements with the lenders- hedge documents and swap contracts which guarantee the pay back to the lenders, in a big infrastructure project". E9 also said that "our lenders (banks) have rights to restrict the dividend payments if contractual variations have an implication on their cover ratios […]. Banks control the accounts". One of the debt providers from a commercial bank mentioned that "shock events can impact cash flows from the project, inevitably we might get paid from the Debt Service Reserve Account" (D3). Direct agreements give specific rights to the banks. They offer third-party consent to the assignment of receivables, and a safeguard that a third party cannot terminate the contract without notice to the banks. The most important safeguard is that "it gives step in rights in the event of a contractor's default" (D4).

This means that if an unexpected event occurs and contractors fail their obligations under the project agreement, negotiation might be finalized with the lenders stepping in. Step in rights give lenders the right to replace a SPV and/or contractors. In summary, our findings show that investors in PPP projects use the SPV to separate themselves from risks.

4.5. Investment manager's financial knowledge and preference

The financial knowledge of investment managers also appeared to be an important investment control mechanism. As one commented: "The complex nature of infrastructure financing creates a need for understanding the current developments, trending sectors, and best regions to invest in. Only experienced investment managers can deal with the complex decision making process of investments" (E1). A remarkable observation from the interviews was that investment managers' preferences also affected the decision to invest: "An infrastructure manager's key responsibility is to manage, keep safe and maximize the profit of the investor's portfolio. Investment managers are often incentivized to drive the best deal possible. Sometimes investment managers make decisions based on their own career goals and drag investors into uncertain revenue streams" (A4).

This illustrates that the investor's managers knowledge is important to deal with the complex nature of infrastructure projects, but that personal preferences can also highly influence choices.

4.6. Public governance and institutional setting

Governments provide fiscal incentives, guarantees, insurances, credit enhancements, currency risk protection, and other instruments to attract investors in public infrastructure investments and mitigate the risks investors can be exposed to. In this context LA1 commented that "to stimulate private project finance, the government's strong political support, a standard contract, a sound contract management approach, and legislation without legal ambiguities are needed. Governments should assure commercial viability, clear project requirements, a clear level of demanded services, proactive management, and a clear allocation of risks". From the interviews it seemed that especially a country's legal system was an important mechanism in the protection of financiers' returns. Some countries have specific laws for private participation in infrastructure projects. For example, Turkey has - Law nr 3996 - realization of certain infrastructure and public services with the BOT model, while some others use standard agreements complementing civil codes with specific contract clauses. For example, in The Netherlands, Rijkswaterstaat has a Standard DBFM Model Agreement that it employs.

These results indicate that investors are more likely to invest in an infrastructure project which has a steady environment and confirm that the standard model agreements play a moderator role in investment decision making.

4.7. Relational governance

All the investment managers agreed that their returns must be protected by a sound contract management mechanism: "Not every risk can be quantified and hedged, the SPV has to deal with issues through sound contract management" (D5). FA2 mentioned that "the higher the level of governance, the greater the chances of guaranteeing investors returns". In this sense, the relationship between the contracting authority and the SPVs was especially mentioned. E3 remarked that "the [country] way of integrated project management used by [public client organization] leads to more collaboration between parties and consequently variations are dealt with more smoothly both in the construction and maintenance processes". According to D3, "we all learned how complicated the actual contract management and implementation of a PPP contract really is. At the end of the day the important underlying principle is a feeling of partnership in a long term relationship. Day-to-day contract management in a relational environment is more important than the contract rules". Collaboration was frequently mentioned in the interviews as a necessary basis for sound contract management. A judgement by the UK Royal Courts of Justice on 22 February 2018 was often referred to. This states that "a PFI contract intended to run for 25 years may be classified as a relational contract [….]. Both parties should adopt a reasonable approach in accordance with what is obviously the long-term purpose of

the contract. They should not be latching onto the infelicities and oddities, in order to disrupt the project and only maximize their own gain".

The relational governance aspect of investment decisions was mentioned very frequently during the interviews. This stresses the need for a relational mechanism to ensure return on investment in addition to the formal contracts.

4.8. Project experience

Most interviewees believed that it is very important that financiers are supported by a highly skilled and knowledgeable joint venture that will successfully bid and implement the project thus ensure a return on investments. Consequently, they "look for the relevant experience in the companies that are going to undertake the design, construction, operation, and maintenance of the facilities in large infrastructure projects" (E5). In this, according to TA3, "the EPC holder experience is the most important, because most of the risks appear in the construction phase", and "there are only a few contractors that can deliver these types of intense and large infrastructure projects. It is essential to choose them" (D3). E1 mentioned the importance of the clients' competence and experience, adding *"Managing the uncertainty and dependencies in the contracts is very important […]. We know that Rijkswaterstaat has professional knowledge to manage DBFM type of contracts and network of relations"*.

The above indicate that investors are keen to see experienced partners who can deal with difficulties, conflicts and other aspects that could danger their investments. Hence, explicit experience with projects can be considered as another mechanism to protect private investments.

4.9. Data management

A final aspect that, interviewees mentioned as an important mechanism to keep track of their return over the life cycle of a protect was data collection and management related to of physical infrastructure and registration of contractual and financial documents. A legal advisor (LA2) commented that "it is very important to keep original and updated versions of contract variations and project documents to keep track of revenues. Those documents are especially valuable during the hand back of the project where investors will receive a large proportion of their return". A project portfolio dashboard, in addition to the regular performance-payment data sheet provided by the SPV, appears to be a useful instrument to keep investors informed of risk conditions: "Investor managers need to keep track of the performance of their assets and need to understand the conditions of their assets under risk" (TA3).

5. Discussion

This paper investigated a constellation of nine mechanisms that are used by private investors to ensure a return on infrastructure investment. From a TCE perspective any issue that arises can be recasted as a matter of contracting. In line with Chang (2015) and Jin and Zhang (2011), our study adds a further discussion on interpretation of the mechanisms underlying the decision making process in the risk allocation process. It was found that in the infrastructure transactions investors appear to combine TCE related mechanisms which include asset portfolio and infrastructure options diversification, evaluation and allocation of risks and uncertainties, financial knowledge, relational governance, project experience, and data management. Hence, this study enhances the transaction cost theory by considering that including these protection mechanisms are transaction costs for investors, seeking for compensation which can be emphasized by the need of equilibrium (see also Williamson, 1985). Additionally, by approaching infrastructure as an investment class as part of economical transaction, the PPP project governance debate in project management literature has been enriched in several ways.

Firstly, in line with the findings of Gatti (2018), the results show that infrastructure investments have low volatility and are less vulnerable to economic changes and inflation than other assets. Our study indicates that infrastucture investments demonstrate an ability to bounce back from economic shocks. Therefore, the inclusion of infrastructure assets into investors' portfolios may reduce the effects of uncertain market movements. Equity investors have therefore been diversifying their portfolios among a wider spectrum of investments, and, especially since the GFC, include infrastructure assets to protect their returns (Blanc-Brude et al., 2017; Thierie & De Moor, 2016). Our findings revealed that investors further diversify their infrastructure assets between different infrastructure options or investment vehicles such as listed or unlisted infrastructure, sectors (e.g., transportation, telecommunication), regions (e.g., Europe, Africa) and maturity level (e.g., greenfield, brownfield). This extended diversification was perceived to be very important, as a way to avoid having too many smilar types of deals in one's portfolio.

Secondly, the study contributes to the debate on risk and uncertainty management by providing an extended critique on risk allocation through formal contracts in infrastructure projects (Burke & Demirag, 2017; Cui et al., 2018; Keers & Fenema, 2018; Sainati et al., 2020). Previous project management studies argue that risks should be allocated appropriately between contracting authority and project sponsors (Cruz & Marquez, 2013; Keers & Fenema, 2018; Wang et al., 2018). Risks are generally predicted and specified, then quantified, priced and buffered into financial models. As a consequence, unquantifiable uncertainties are as far as possible either not accepted or contracted away to others as externalities. In this context, the results are quite consistent with the principles of TCE. Hence, TCE provides useful framework to explain that infrastructure financiers emerge to minimize their costs by externalization of uncertainty and safeguard their return on investment (Joskow, 1985; Williamson, 1985). Investors seem predominantly concerned with risks that might affect their returns, and do not feel it is their responsibility to deal with uncertainties in the public infrastructure itself. The Dutch standard DBFM model contract used by their national highway agency Rijkswaterstaat, for example, states that *"with respect to the occurrence of unforeseen circumstances, parties agree that they have willingly and wittingly entered into this long-term agreement and that the mechanisms that are included in this agreement are already intended to deal with the consequences of any possible unforeseen circumstances that may arise"*. The interviews, however, showed no evidence that investors want to agree with the premise that they should willingly and wittingly accept any responsibility in dealing with the consequences of uncertainty. Although risks are a factor in the viability of projects (Owolabi et al., 2019), our findings indicate that financiers are in favor of uncertainty being backed up by government support. The interviewees appear to consider uncertainty as uncontrollable which should remain with the public sector. By considering financier's mechanisms to protect return on infrastructure investment this study explicates the underlying interplay between uncertainty and incompleteness of the long term contract (such as standard DBFM agreements) by indicating that financiers behave rather opportunisticly by taking actions that increase the costs that will be obtained by the other party (see also Williamson, 1985). This behavior does not maximize the joint gains when a particular contengincy arises. Therefore, it is no surprise that the consequent costs end up being borne by the tax payers in PPP projects. Ex-post emerged opportunism can give financiers monopoly power when contengies arise and they seek for their own-stakes. The findings confirm that when contengencies arise that are not covered by formal contractual provisions, one party has a strong incentive to behave badly, which increases other party's costs as also indicated by Joskow (1985). Financiers generally close their eyes to uncertainties until the results will come back with additional transaction-specific costs to unfold events and contract adaptation will be reached as previously described by Williamson (1985). The findings of this study could provide a guidence for future contract designers to take financier's return protection mechanisms into account while drafting incomplete contracts.

Thirdly, infrastructure development PPPs are considered beneficial to the public sector because certain risks are transferred to the private sector which is basic part of the PPP definition. Here it is worth emphasizing that the SPV structure used to deliver PPPs facilitates equity and debt holders in protecting their investor returns by passing the important risks from SPV to the contractors through back-to-back type contracts. In line with Sainati et al. (2020), we see that to avoid being burdened with the ownership of risks, investors isolate the SPV from the risks to protect themselves. To this end, financiers force contractors to accept the most important risks in order to become part of the deal. Given that the risks and uncertainties can be relatively high in public infrastructure and that contractors accepting these risks are increasingly facing collapse, the costs to the public sector will increase. The use of key covenants, pledges on the company shares, and security on receivables show the dominancy of the debt provider over the service providers. If an unexpected event occurs resulting in the contractor defaulting, negotiation might be finalized with the lenders stepping in. The initial direct agreements made between the lenders and the public contracting authority provide the lender with this one-sided step-in right. In a PPP, this is an important mechanism to protect the debt provider's investment and gives them right to replace contractors to protect future returns. Our study shows how investors aim to be risk free by transferring risks through a network of contracts to the contractors. Using the back-to-back contract principle leads to risks being allocated between the contracting authority and the contractors, rather than between the contracting authority and the SPV. This does not follow the basic logic of allocating risks appropriately. Moreover, the term 'contract' in TCE is equivalent to a complex of contracts in large infrastructure PPP projects resulting in less capacity to deal with uncertainty and increased transaction costs when an uncertain event emerges. Consequently, there is a growing reluctance among western governments to procure public infrastructure through a PPP or PFI. With financiers aiming for a risk free SPV, our findings also uncovered differences in return protection measures between equity investors and lenders. The debt providers bear less risk than equity investors because they have priority into receiving government payments. In addition, lenders have directly agreed step-in rights to protect their future returns if things go wrong. Our results indicate that key covenants seem to provide the authorization for lenders to block dividend payments. This immediately shows PPPs are based on a formal contractual governance mechanism. If things go wrong, parties' defect from the verbal promises and refer to the letter of the contract.

Fourthly, third party advisors are often used by investors to help in their investment decisions. The complex character of infrastructure investment requires specialist input from legal, financial, technical and tax advisors. As Flyvbjerg (2013) observed, an outside view provided by advisors about the bankability of a project helps investors assess risks and uncertainties in deciding whether they will go ahead or not. Advisors not only help in assessing potential associated risks but can also suggest mitigation measures during the project implementation and operation. In line with Demirag et al. (2012), our findings indicate that the due diligence performed by financiers is aimed purely at protecting the investment. In addition, investors use rating agencies and risk quantification models for the valuation of a project in their decision-making process. One may pose the question as to whether such an approach is appropriate when there is real uncertainty as in the complex environment of modern public infrastructure investment. As a result of the adopted risk-based approach, investors are predominantly concerned with risks that might affect their returns and do not feel responsible for the public infrastructure itself. As a result, the role of investors in, for example, public-private partnerships, which are notionally based on the idea of aligning of interests by sharing responsibilities, is not that of a true partner but merely a resource provider.

In addition, this study indicates in line with the findings of Vecchi et al. (2017) and Wang et al. (2019), that government actions form an important mechanism in protecting the returns of investor in public infrastructure. To attract sufficient private capital, it seems that public grants and/or subsidies are necessary to convince investors of an adequate return. This creates a paradox since the reality seems to be that investors require public grants and/or subsidies to invest in public infrastructure. Since most governments need private capital to finance their infrastructure ambitions, they are forced to deliver those grants. However, this contradicts the widely used PPP model for the procurement of public infrastructure that is based on the sharing of risks among all the partners involved in the PPP.

The study revealed that risks can be managed by contractual governance mechanisms and these safeguards return on investment. However, results also indicates that the contractual governance is not sufficient by itself to safeguard return on investment. In line with theoretical insights from previous studies on PPP governance, our findings suggest that next to formal governance (contracting), relational governance has a purpose to provide a protection mechanism for infrastructure financiers. This relational aspect complimentary to formal governance is relevant to understand financiers' return on investment associated from a TCE perspective assuming to "work things out" when the investment is idiosyncratic (Williamson, 1979). The investors return has to be protected through a sound contract management mechanism where day-to-day contract management in a relational environment is crucial. In line with Benítez-Ávila et al. (2018) and Demirel et al. (2019), this study, however, also shows that relational partnering mechanisms are an important way to deal with changes and thus risks and especially uncertainties in the total lifespan of a long partnership. As such, the collaboration between parties can be seen as a necessary and flexible complement to the contractual agreements. In this light, the way investors define their involvement in an infrastructure project partnership, raises the question if their choice of control mechanisms isn't actually too limited and shortsighted.

Finally, the study highlights that information and data gathering, adequate information exchange, and documentation form another control mechanism that is employed by financiers of infrastructure projects. This eases the flow of information and provides investors with an instrument to keep track of returns over the entire life cycle of a project. This data is very often confidential, yet excessive confidentiality within projects and between projects creates a huge barrier to transparency and learning. Here it could be possible for public authorities to play a role by requesting, recording and disclosing data, for example in return for providing guarantees and/or subsidies. Moreover, increasing transparency about risks and risk measures will enhance learning and may boost the attractiveness of investing in public infrastructure. Government officials should, however, concern better non-confidenality in the financing structure of infrastructure transactions.

6. Conclusions

This study aimed to provide an understanding of how financiers in infrastructure PPP projects protect their returns on investment through control mechanisms. For this purpose, data on the investment practices of finance actors, collected through a set of interviews were critically reflected upon in relation to existing literature on this topic. Based on this reflection, it can be concluded that:

- Infrastructure investments have a low volatility and are less vulnerable than other assets to economic changes and inflation. As such, investing in infrastructure makes a valuable contribution to investment portfolio diversification as a way to protect investors' returns against shocks and uncertainties in the market;
- Nine main control mechanisms could be identified to ensure returns on investment in (public) infrastructure development projects in which transaction costs economics and project governance play an important role: asset portfolio allocation, diversification among different infrastructure options, evaluation of risks and uncertainties,

allocation of risks, financial knowledge, public governance and institutional setting, relational governance, project experience and data management;

- Investors in infrastructure projects seem predominantly risk-oriented and approach uncertainty as uncontrollable. Investors are mainly concerned with risks that might affect their financial returns and do not feel responsible for dealing with uncertainties associated with the public infrastructure itself. They aim to be risk and uncertainty free by transferring risks and uncertainties through a network of contracts to subcontractors. This goes against the basic logic of allocating risks to those who can best manage them, nor with the basic assumptions of PPP in general;
- To ensure an adequate return on investments, public grants and/or subsidies seem to be essential in infrastructure projects. Since most governments need private capital to finance their infrastructure ambitions, they are forced to provide such grants. This contradicts the general procurement models for public infrastructure that are based on the sharing of risks among all the project partners involved;
- In addition to 'classical' transaction cost theory a combination of formal contractual and relational governance mechanisms is considered as favorable and vital for the protecting return on investment.

Finally, the Covid-19 pandemic will probably impact the economy in unprecedented ways. Will public infrastructure projects continue to be attractive to private investors? Will governments enhance investments in infrastructure to stimulate their economies and addresses the challenges of future days? And if so, will infrastructure projects be substantially financed by debt or will business models change? We simply do not know. However, based on findings of this study one may expect private investment in public infrastructure to continue. This study has shown that infrastructure is essentially seen as just another asset class, albeit one that has certain unique attractions. It is, however, still approached in line with traditional financial market expectations: i.e., building a finance structure that hedges against all risks and guarantees shareholder value. In this basis, it is maybe time that infrastructure should be no longer considered as a single asset but seen as a socio-economic collective development by private investment. Hence, a recommendation is for extending this study would be to also take into account the associated public challenges into mechanisms that protect the returns of private investors.

Further research could investigate if the growing appetite for investing private equity in the infrastructure sector may force private investors to shift from pure profit-driven investment to more socially responsible financing. Due to the growing investment interest, there is now a broad range of new funds available, which also might trigger alternative financing strategies. When availability exceeds demand, the relative power of public infrastructure may increase providers to combine private investment with societal ambitions such as sustainability or livability. This would not only benefit private investors but also the society as a whole.

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None

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Data

Research data is confidential

Appendix 1

Nr	Type	Organization and Positon	Nr	Type	Organization and Position
1	Equity (E1)	Pension Funds, Director	14	Debt (D5)	Investment Bank, Director
2	Equity (E2)	Pension Funds, Investment Manager	15	Financial Advisor (FA1)	Investment Bank, Director
3	Equity (E3)	Private Equity, Asset Manager	16	Financial Advisor (FA2)	Consultancy firm, Director
4	Equity (E4)	Private Equity, Managing Director	17	Legal Advisor (LA1)	Legal firm, Partner
5	Equity (E5)	Private Equity, Managing Director	18	Legal Advisor (LA2)	Legal firm, Director
6	Equity (E6)	Private Equity, Director	19	Technical advisor (TA1)	Engineering and Technical Consultancy, Director
7	Equity (E7)	Insurance Company, Head of Infra Investments	20	Technical advisor (TA2)	Technical Consultancy, Director
8	Equity (E8)	Construction company, Director	21	Technical advisor (TA3)	Technical Consultancy , Director
9	Equity (E9)	Construction company, CFO	22	Analyst (A1)	Rating Agency, Director
10	Debt (D1)	Commercial Bank, Director	23	Analyst (A2)	Economic Organization, Researcher
11	Debt (D2)	Commercial Bank, Director	24	Analyst (A3)	Journal, Editor
12	Debt (D3)	Development Bank, Head of Investments	25	Analyst (A4)	Journal, Editor
13	Debt (D4)	Development Bank, Director			

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