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How Special Purpose Entities (SPEs) Affect The Governance of Infrastructure Megaprojects

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HOW SPECIAL PURPOSE ENTITIES (SPEs) AFFECT THE GOVERNANCE OF INFRASTRUCTURE MEGAPROJECTS

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ABSTRACT

Special Purpose Entities (SPEs) are widely used in megaprojects for project finance and partnering transactions. There are many publications concerning the legal, financial and accounting proprieties of SPEs, particularly for commoditised transactions such as securitisation. A literature review confirmed that the SPEs are well known for their financial and accounting proprieties, but the most significant gap concerns governance. The paper paves the way for further research on the design and structuring of SPEs for better infrastructure megaprojects. In particular, it examines the governance mechanisms applied to the governance of megaprojects by means of SPEs.

The research employs a grounded theory approach, which is prevalently based on semi-structured interviews for the data collection. The results of the research include: a classification of the existing types of SPEs, the identification of the relevant types of SPEs for the governance of megaprojects, classification of their functions for the megaproject and the explanation of how SPEs influence the governance of megaprojects.

KEYWORDS

Special Purpose Vehicle (SPV), project finance, governance, infrastructure megaproject

INTRODUCTION

Infrastructure megaprojects are large-scale investment projects. They typically cost more than US\$1 billion (Merrow, 2011) and are characterised by:

- Vast impact into economy society and environment (Floriciel and Miller, 2001);

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- Long-term commitment: the lifecycle persists for several decades (Florice and Miller, 2001);
- Involvement of public actors such as governments (Sanderson, 2012);
- Turbulent/dynamic environment (Morrow, 2011);
- Significant risk for the sponsoring (Locatelli and Mancini, 2010; Van de Graaf and Sovacool, 2014);
- Organisational complexity: megaprojects involve hundreds of companies (Ruuska et al., 2009; Aaltonen and Kujala, 2010).

Examples of infrastructural megaprojects include long bridges & tunnels, highways, railways, airports, seaports, nuclear plants, and large dams.

Enforcing instruments are key components in planning and delivering megaprojects since they bring together several instructions, either public or private, and they provide a normative framework for the project. Enforcing instruments regulate the formal relationship between project stakeholders. Examples of enforcing instruments are contracts, concessions, patents, ownership rights, securities.

Often, new companies are set up to incorporate joint ventures or to enhance sophisticated economic transactions. The incorporation of these companies is often justified for legal, accounting or financial reasons (Basel Committee on Banking Supervision, 2009). These companies are generally referred as Special Purpose Entities (SPEs), Special Project Vehicles (SPV), Project Companies, etc. SPE is a really generic term which can be used for a variety of companies. For instance, SPEs can play a relevant role in the design, delivery or operation of megaprojects (Vinter and Price, 2006).

The aim of this paper is to show how SPEs influence the governance of infrastructure megaprojects. In particular, this paper addressed the following research objectives.

- RO1 - To classify the existing types of SPEs.
- RO2 - To identify which types of SPEs play a critical role in the governance of megaprojects.
- RO3 - To identify the functions associated to the SPEs in infrastructure megaprojects.
- RO4 - To understand how the SPEs influence the governance of infrastructure megaprojects.

The rest of the paper is organised as following. Section 2 presents the literature review focused on SPE and megaproject. It includes a bibliometric analysis to derive the gap in Knowledge. Section 3 summarises the research methodology, the grounded theory, providing the justification and operationalisation. Section 4 is the results section providing an answer to the research objectives. Finally, Section 5 is the conclusion summarising the key ideas of the papers.

MEGAPROJECT LITERATURE REVIEW

Relevance of SPEs for megaprojects

Although megaprojects are important for modern economies and societies, they have a history of poor project management performance (Merrow, 2011; Locatelli, Mancini and Romano, 2014). There are explanations for these poor performances; some of these lie on the inherent complexity, difficulty, and uncertainty of the megaproject endeavour; e.g. the optimistic bias associated with forecasts (Flyvbjerg, 2006) or the technical uncertainty due to First Of A Kind (FOAK) issues (Locatelli and Mancini, 2012)

Scholars refer to governance challenges at either a strategic or tactical level, e.g.

- Strategic misinterpretations of decision-makers (Flyvbjerg, 2006), sometimes even corruption (G. Locatelli et al., 2017);
- Cultural distance and lack of effective collaboration between project stakeholders (Ruuska et al., 2011);
- Poor Front End Engineering and Design (FEED) (Samset and Volden, 2016), (Merrow, 2011).

The Megaproject cost Action (<http://www.mega-project.eu/>) showed that SPEs are relevant for megaproject performance (Brookes and Locatelli, 2015; Brookes, Locatelli and Mikic, 2015; Locatelli, Invernizzi and Brookes, 2017). The researchers of the Megaproject cost Action identified which megaproject characteristics are statistically correlated to megaproject performance. They employed the Fisher Exact Test and machine learning to make reliable statistics even with a small and heterogeneous sample of projects. One of the most relevant result is the correlation between the presence of SPEs with the planning and construction performance. In particular, when one, or more SPEs are incorporated for megaprojects:

- Their planning is more likely to be delayed;
- Their construction is more likely to be on time and on budget.

This empirical result highlighted the correlation between the use of SPEs and the project management performance. However, it does not provide explanations. The research extends these empirical results and provides a theoretical explanation.

Bibliometric analysis & Project Governance

The author employed an extensive bibliometric analysis (Sainati, Locatelli and Brookes, 2017), which resulted in the retrieval of 2166 journal papers based on a set of keywords (SPEs and synonymous). According to (Pittaway *et al.*, 2004), the papers were, filtered and ranked considering their title and abstract. The most relevant documents were reviewed entirely. A larger sample of pertinent (but not necessarily relevant for the research) documents was used to map the state of the art of the literature. Their abstract, title and keywords permitted to classify them according to two main dimensions: discipline and topic. Discipline refers to the journal, for example when papers were published in the International Journal of Project Management they were classified as a project management disciplines. Topics refer to specific themes, often cross-disciplines. The topics were determined from the open-coding (Corbin and Strauss, 2015).

Figure 1 presents the state of the art of the literature showing many publications concerning the legal, financial and accounting proprieties of SPEs, particularly for commoditized transactions such as the mortgage securitization. In project management, SPEs are often mentioned concerning project finance and procurement. Indeed SPEs are well known for their financial and accounting proprieties.

The most significant gap relates to governance. Governance is defined as “*the processes of interaction and decision-making among the actors involved in a collective problem that leads to the creation, reinforcement, or reproduction of social norms and institutions*” (Hufty, 2011). The governance of megaproject is a key determinant of project performance (Miller and Lessard, 2001). Megaprojects involve several stakeholders working towards common objectives. Formal governance provides a common decision-making framework, which allows stakeholders to cooperate effectively. It also provides the basis for assigning roles and responsibilities to project stakeholders. For instance in project finance, SPEs regroup the most relevant enforcing instruments: public concession and guarantees, licenses and environmental permits, loan agreement, EPC contract, offtake agreement, supply agreement, etc. These instruments together shape the formal governance of megaprojects.

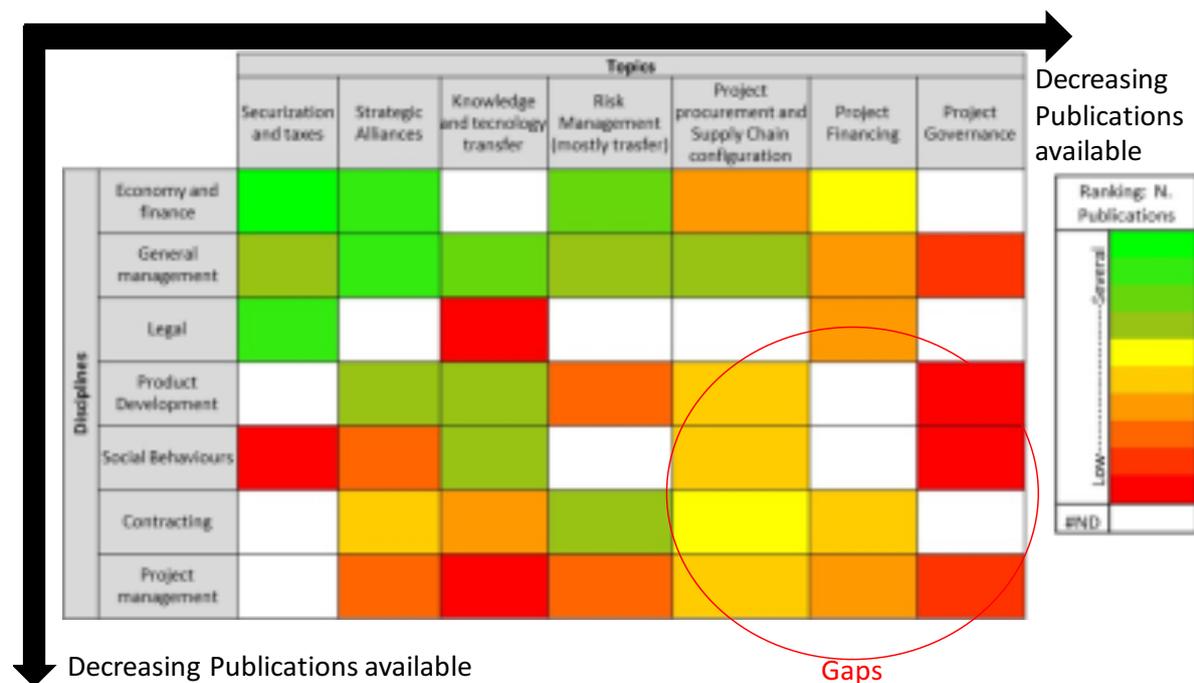


Figure 1: Gap in the literature concerning SPEs

SPE IN MEGAPROJECTS

SPE is a term used in many fields, including structured finance, e.g. securitization, leasing, etc. (Basel Committee on Banking Supervision, 2009). They are also used in accounting to improve credit metrics or for tax optimisation purposes.

Many definitions of SPEs are inconsistent when compared. Depending on the field considered, there are specific definitions, understanding and use of SPEs. The literature review clusters the

different understanding of SPES in three main different knowledge domains: legal, financial and project management.

Figure 2 summarises the comparison of the three domains and the rationale used to filter the key features of any SPE. (Sainati, Locatelli and Brookes, 2017) provides a new definition of SPE: “*The Special Purpose Entity is a fenced organisation having limited pre-defined purposes and a legal personality*”. This implies that SPEs are organisations having three distinctive features:

1. **fenced entity:** SPEs are “Ring Fenced organisation” or “Orphan Entity” having their ownership share settled on a trust (Basel Committee on Banking Supervision, 2009; United Nations Economic Commission for Europe (UNECE), 2011). There are legal mechanisms to isolate assets, liabilities and risks associated to the SPE; which are essential for most of the SPE activities including: securitization (Fabozzi, Kothari and Others, 2008) and PF. Another key aspect is the “bankruptcy remoteness” principle, isolating SPEs from the risk of Bankruptcy arising from its originators (Sewell, 2006).
2. **limited and pre-defined purposes:** SPEs are instrumental to achieve specific objectives determining their lifetime. Once the SPE performs the predefined purposes, it ceases to exist; e.g. it becomes another type of organisation (this sometimes happen in PPP megaprojects). In legal terms, SPEs have “Scope limitations” in accordance with their statute and contractual provisions (Caselli and Gatti, 2005). Usually, in megaprojects, the “shareholders agreement” set the predefined purposes.
3. **legal personality:** SPEs are incorporated companies (Basel Committee on Banking Supervision, 2009). Depending on the jurisdiction, they can assume one of the possible legal forms: e.g. trusts, partnerships, limited liability partnerships, corporations and limited liability companies (Basel Committee on Banking Supervision, 2009; Feng, Gramlich and Gupta, 2009). The legal personality is an essential status to enable the other distinctive features.

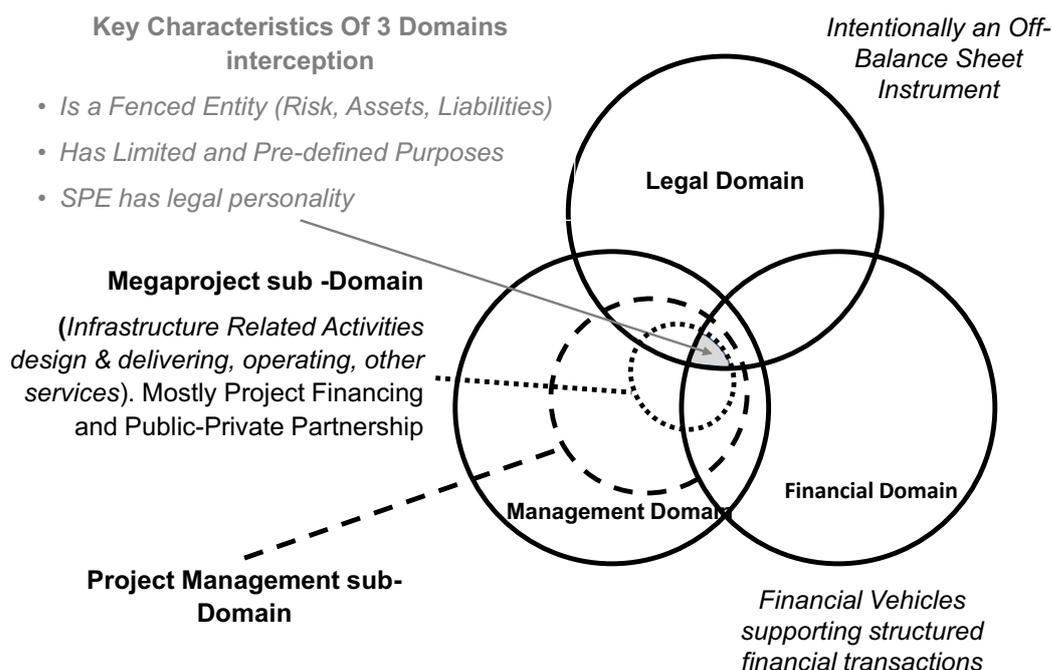


Figure 2: Knowledge domain sets associated with the SPE and defining characteristics
(Sainati, Locatelli and Brookes, 2017)

In megaprojects, SPEs are employed for two main purposes, which are sometimes combined:

Project finance (PF) is: “the raising of funds on a limited-recourse or nonrecourse basis to finance an economically separable capital investment project in which the providers of the funds look primarily to the cash flow from the project as the source of funds to service their loans and provide the return of and a return on their equity invested in the project” (Finnerty, 2013). PF gives financial advantages for the project shareholders increasing their capability to raise more capital at a lower cost; which are fundamental aspects in megaprojects. PF has a long due diligence and negotiation process at the beginning of the project (i.e. conceptual design, planning). This is necessary because external financiers want sufficient guarantees to legitimate the increase of leverage and decrease of cost of debt. Risks identification and transfer are the most important aspects. These aspects are addressed by specific contracting mechanism (e.g. off-take contracts) supporting the viability of the project. The SPEs is used to isolate the project risks and to create a central point of responsibility. The negotiation process underlying the SPE is a critical phase of the Front End Engineering Design (FEED) and it plays a central role in determining critical aspects of the megaproject, including its governance (Artto, Ahola and Vartiainen, 2016; Matinheikki *et al.*, 2016) and the technology to adopt (Gil, Miozzo and Massini, 2012).

Project partnering creates synergies among project stakeholders by aligning their interests (Clifton and Duffield, 2006). There are several types of partnerships: PPP, corporate partnership, joint venture, consortium (Grimsey and Lewis, 2007)(Jooste, Levitt and Scott, 2011). **Error! Reference source not found.** presents the main differences according to two main drivers: duration of the partnership and partnership vehicle. Partnerships in megaprojects often include public and private organisations and are called Public-Private- Partnerships (PPP). SPE are therefore the legal entities incorporating the joint ventures among project stakeholder.

Table 1: Different types of partnership

	Duration of the partnership	Partnership vehicle
Partnership (general meaning)	Either Short-medium-long horizons	Can be based on a variety of options: contracts, SPEs, shareholder agreement, other types of agreement, etc.
Corporate Partnership/ Joint Venture	Medium- Long-term horizon	Usually Based on shareholder agreement and/or dedicated companies (i.e. SPE)
Project Joint Venture	Short-term horizon (e.g. design of a new product, construction of an infrastructure, etc.)	Usually based on SPEs
Public Private Partnership	Short- medium term horizon (e.g. the infrastructure lifetime, the concession period, etc.)	Usually based on SPEs

Consortium	Usually short term horizon (e.g. delivery of a project)	Based on two layers of agreements: internal agreement (between the parties involved in the consortium) and external (between the consortium and the external stakeholders, e.g. Client). The consortium doesn't involve dedicated companies (e.g. SPEs), rather on the joint liability that consortium members have in the eyes of the external stakeholders. The extent by which the parties are jointly liable may change depending on the type of consortium, and the legal and contractual framework applied.
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RESEARCH METHODOLOGY

The investigation of SPE's has five main research challenges:

1. limitation in experiment design;
2. limited ability to apply statistics;
3. structural and inherent complexity of the research problem;
4. confidentiality of the information;
5. restricted number of experts.

Firstly, **it is not possible to do experiments**. Megaprojects cannot be replicated in a controlled environment, and the underlying organisations are too big to do experiments. Virtual simulations are unsuitable to study their governance because the contractual, normative and organisational dimensions describe complex and interactive phenomena that are difficult to model quantitatively. Sometimes, the simulation techniques are applied to the SPEs to study specific phenomena such as their financing. However, the current research is too holistic to apply such simulation techniques.

Secondly, there is **limited opportunity to apply statistics**. Megaprojects are limited in number worldwide, and they are almost unique in terms of technology, context (political, economic, legal, social, environmental, etc.), supply chain, etc. There are researchers about megaprojects that apply statistics, such as (Flyvbjerg, Bruzelius and Rothengatter, 2003; Merrow, 2011; Brookes, Locatelli and Mikic, 2015). However, these researchers consider standardised variables such as the delay and over-budget. These variables are available in every megaproject and permit a quantitative comparison. Conversely, this research focuses on the governance structure resulting from the involvement of SPEs in the megaproject contracting network. The network structure is determined by several contextual factors and can assume a variety of configurations (Steen, Coopmans and Whyte, 2006). This research focus cannot be represented/ modeled by standardised variables, which are available in every megaproject. This focus implies that it is not possible to obtain a large and uniform sample of megaprojects. This limitation inhibits the use of statistics.

Thirdly, both the **megaprojects and their contracting and governance framework are complex**. Megaproject are structurally complex because are made up of different parts (different physical parts, different institutions, etc.) interrelated by different typologies of interactions (e.g. organisational, information, legal, etc.) (Baccarini, 1996; Williams, 1999; Miller and Lessard, 2001; Ruuska *et al.*, 2009). Megaprojects are inherently complex, because, further than being structurally complex, they have high level of ambiguity and uncertainty

(Gidado, 1993, 1996). As a result, the megaprojects cannot be conceptualised directly. Their study requires the breakdown of the complex phenomenon into pieces that are more easily understandable and describable. This breakdown can adopt different rationales and perspectives leading to different focuses of the megaproject phenomena. This complexity limits the ability to comprehend and conceptualise the research phenomenon wholly. For instance, SPEs and their contracting network are made up of several stakeholders, entailing different purposes and perspectives in a dynamic way. These layers of complexity emphasise the inherent multidisciplinary of the research topic, entailing the managerial, legal, engineering, economic, financial and social domains.

Fourthly, the data collection is undermined by a major constrain: the **confidentiality of contractual documents**. This represents a major limitation and is probably the most critical.

Fifthly, there is a **limited number of experts with negotiation and design experience of SPEs in megaprojects**. Whilst there exists a variety of expertise connected, to some degree to the SPEs, such as lawyers, bankers, financial analysis, public servants, etc. , most of these focus on limited and specific aspects of the negotiation or operation of SPEs. The number of few experts having a broad experience in designing and negotiating SPEs for infrastructure megaprojects is small.

These challenges permitted to filter and to select the methods used for the data collection and the data analysis.

SELECTION OF THE RESEARCH STRATEGY

According to (Mark N K Saunders, Lewis and Thornhill, 2015), there are seven research strategies: experiment, survey, case study (either single or multiple case studies), action research, Grounded Theory (GT), ethnography and archival research. Ethnography was first discharged because it is used to study cultural phenomena. The strategy considers the social aspects, while the research focuses on the normative ones.

The authors considered the research challenges to select the most appropriate research strategy as shown in **Error! Reference source not found.**

Table 2: Selection of the research strategies. Legend: X (major limitation), - (minor limitation), +/- (the method can be fitted with the challenge), + (the challenge is not a relevant limitation), √ (the method is suitable for the research challenge)

		Research challenges				
		(1) Limitation in experiment design	(2) Limitation in statistics	(3) Complexity of the topic	(4) confidentiality	(5) Limited N. experts
Research strategies	Experiment	X	-	-	-	
	Survey	√	-	-	+	-
	Single case study	√	X	√	X	
	Multiple case study	√	+/-	+/-	-	
	Action research	√	√	√	X	
	Grounded Theory	√	√	√	+	
	Archival research	√	√	√	X	

GT was selected as the main method of the data analysis. The authors chose this method because it is the most suitable to cope with the five research challenges. There are different ways to apply GT. In particular, there are two main schools of thought: the Glaser (Glaser, 1978, 1992, 1998) and the Strauss-Corbin (Strauss and Corbin, 1998; Corbin and Strauss, 2015). The former is more empirically oriented, and it advocates the minimum intervention of the researcher (M. N. K. Saunders, Lewis and Thornhill, 2015). Conversely, the Strauss-Corbin school emphasise the essential contribution of the researcher's reflexivity (Corbin and Strauss, 2015). The author selected the Strauss-Corbin approach because reflexivity is considered essential to cope with the complexity and multi-disciplinarity of the field.

Multiple case study (MCS) was considered for the ability to describe and generate theories about complex phenomenon (Yin, 2013). The challenge relating to the confidentiality of the information was less restricting for MCS than for Single case studies because the level of depth and detail of information is reduced in the former case. The research employs a MCS to describe specific configurations of the contracting networks. The potential of MCS (Eisenhardt, 1989; Yin, 2013) was not exploited to formulate the principle of delivering theory. MCS was used to support GT which is the prevalent method adopted for the research analysis.

SELECTION OF THE METHOD FOR DATA COLLECTION

For the data collection, the following sources/ methods were considered: Archives, Observations, Interviews, Secondary and Primary documentation. **Error! Reference source not found.** shows the suitability of these sources/ methods for the five research challenges.

Table 3: Selection of data collection methods. Legend: X (major limitation), - (minor limitation), +/- (the method can be fitted with the challenge), + (the challenge is not a relevant limitation), √ (the method is suitable for the research challenge)

Research challenges

		(1) limitation in experiment design	(2) Limitation in statistics	(3) Complexity of the topic	(4) confidentiality	(5) Limited N. experts
Data Collection Methods	Archives		+	X	X	√
	Observations		√	√	X	√
	Interviews		+	+	+	√
	Secondary Docs		+	+/-	+	√
	Primary Docs		X	X	X	+

Interviews were adopted as the principal method for data collection. The author selected the semi-structured interviews because more suitable, than other approaches, to the complex phenomena investigated.

Secondary documentations (e.g. news, institutional reports, and manuals) were included in the data collection to supplement the semi-structure interviews. The interviewees supported the selection of the relevant documentation.

RESEARCH DESIGN

The research design is composed of 3 steps and 6 sub-steps as following

- Data collection (preliminary sampling, theoretical sampling, interview protocol)
- Data analysis (coding, theoretical conceptualization)
- Testing and review

Data collection

Preliminary sampling. The interviews started with a predetermined sample of experts including senior lawyers who negotiate and design SPEs, bankers, directors of SPEs, project managers.

Theoretical sampling: it orientates the selection of the experts to interview. The theoretical sampling considers the gaps in the emergent theories, and it provides the rationale to overcome them. The experts suitable to address these gaps are the ones to interview. During the research development, some gaps are filled, and others emerge. The theoretical sampling considers this dynamic evolution and permits to readapt the original sample of experts.

Table 4 summarises the sample of the experts interviewed. Table 4 presents the code of the expert (the name was anonymised), the background, their experience concerning the SPEs in megaprojects, and their referencing Infrastructure Sectors. During the application of the theoretical sampling, the researcher realised that the experts that have a systemic view about the functioning of the SPEs are primarily the experts that design and negotiate them.

Table 4: Sample of the experts interviewed

Code Expert	Background	Experience concerning SPEs	Infrastructure Sector
E1	Management	Control - portfolio level	Oil & Gas
E2	Law - Finance	Negotiate, design and operate/direct	Infrastructure Widespread
E3	Law	Negotiate and design	Infrastructure Widespread
E4	Law	Negotiate and design	Infrastructure Widespread
E5	Law - Finance	Negotiate and design, control	Infrastructure Widespread
E6	Engineering - Management	Procurement	Oil & Gas, Iron metallurgy
E7	Law - Finance	Negotiate and design, control	Energy
E8	Engineering - Management	Operate/direct	Energy
E9	Engineering - Management	Operate/direct. Project management	Transport
E10	Finance	Negotiate, design and operate/direct	Infrastructure Widespread
E11	Law - Finance	Negotiate and design	Infrastructure Widespread
E12	Finance - accounting	Analyst	Energy, Nuclear
E14	Law - accounting	Negotiate and design	Infrastructure Widespread
E15	Management	Negotiate and operate/direct	Oil & Gas
E16	Engineering - Management	Negotiate, operate and direct, project management	Transport, Energy, Nuclear
E17	Engineering management - Finance	Negotiate and operate/direct	Transport
E18	Engineering - Management	Procurement	Oil & Gas, Iron metallurgy
E19	Law - Finance	Negotiate and design	Nuclear
E21	Management	Negotiate and control	Infrastructure Widespread
E22	Finance - accounting	Negotiate and design	Infrastructure Widespread
E23	Management	Negotiate and operate/direct	Infrastructure Widespread
E24	Law - accounting	Negotiate and design	Infrastructure Widespread
E25	Finance - accounting	Negotiate, Analyst	Energy
E26	Finance - accounting	Negotiate, control, operate/direct	Infrastructure Widespread
E27	Engineering - Management	Regulate	Nuclear
E28	Finance - accounting	Negotiate, insure	Nuclear

Interview protocol: A detailed procedure was used to engage, conduct and follow up the interviews. Some questions were asked to all interviewee. Other questions changed every time

considering: the gaps to address, the interviewee's knowledge and experience, the emergent themes and ideas, etc. The theoretical sampling permitted to tailor specific questions. The interviews were recorded (upon agreement with the interviewee) and then transcribed.

In particular, the general questions that were asked to all the experts, at the beginning of any interview were:

1. In your experience, are SPEs relevant for the governance of infrastructure megaprojects?
With one exception (E9/ I10) all other experts answered yes.
2. How the SPEs influenced the governance of infrastructure megaprojects?

The second question permitted to open up to the semi-structure interview and to engage discussion with the experts. The focus of the conversation and the related questions changed during the various phases of the research. Every interview followed by the data analysis and the theoretical sampling. Consistently, from time to time, the interviewed focused on the emergent concept and on the existing gaps to be filled. Table 5 summarises the evolution of the focus throughout the data collection process. Table 5 presents the code of the interview, the date, the critical topics to be discussed in detail (i.e. the topics highlighted by the theoretical sampling requiring further clarification) and the relevant topics that emerged from the discussion.

Table 5: List of the interviews and critical topics considered.

Code interview/ expert	Date	Priority topics highlighted by the theoretical sampling	Emergent topic
I01/E1	21/05/2014	Unit of Analysis	
I02/E2	11/11/2014	Unit of Analysis	Functions of SPEs
I03/E3, E4	26/03/2015	Unit of Analysis, Configuration of SPE-network	Security Package, Conflicts of interest, who negotiate and design the SPEs,
I04/E1	21/04/2015	Unit of analysis, power and control of SPE and SPE-network	Dynamic evolution of SPEs
I05/E2	28/04/2015	Unit of analysis, contextual conditions, dynamic evolution of SPEs, types of SPEs, board of directors, who negotiate and design the SPEs, Functions of SPEs	Internal policies
I06/E5	22/06/2015	Internal policies, conflict of interest, power and control of SPE, board of directors, loan agreement, Functions of SPEs	
I07/E6	23/06/2015	Procurement, contextual conditions	SPEs and partnering
I08/E7	25/06/2015	Internal policies, conflict of interest, board of directors, security Package, loan agreement, Functions of SPEs	
I09/E8	26/06/2015	Board of directors, power and control of SPE, conflict of interest, internal policies	
I10/E9	29/06/2015	Relationship between the governance and the project management	Relationship between the governance and the project management
I11/E10	08/07/2015	Conflict of interest, power and control of SPE, dynamic evolution of SPEs, board of directors, loan agreement, SPEs and partnering	Stakeholder engagement
I12/E11	09/07/2015	Security Package, loan agreement, shareholder agreement	Multiple jurisdictions
I13/E12	14/07/2015	Who negotiate and design the SPEs	Relevance of trust, governance and finance
I14/E13	20/07/2015	Multiple jurisdictions, security package, loan agreement, shareholder agreement	
I15/E14	21/07/2015	Multiple jurisdictions, relationship between the governance and the project management, power and control of SPE, stakeholder engagement, SPEs and partnering	Relational/ political aspects of SPEs
I16/E15	30/07/2015	Relationship between the governance and the project management, power and control of SPE, stakeholder engagement, SPEs and partnering, internal policies	
I17/E16	26/08/2015	Relationship between the governance and the project management, power and control of SPE, loan agreement, shareholder agreement, stakeholder engagement, internal policies	
I18/E17	14/10/2015	Procurement, SPEs and partnering, contextual conditions	
I19/E18	19/10/2015	Challenges and limitations of SPEs	SPEs in Nuclear
I20/E2	30/10/2015	Broad discussion and review of the results of the research	
I21/E19	13/05/2016	Loan agreement, shareholder agreement, power and control of SPE, governance and finance	

I22/E20	16/06/2016	Multiple jurisdictions, governance and finance	
I23/E21	17/06/2016	Shareholder agreement, stakeholder engagement, board of directors	
I24/E22	10/07/2016	Multiple jurisdictions, shareholder agreement, board of directors, security package	
I25/E23	14/10/2016	Challenges, limitations of SPEs, SPEs in nuclear, governance and finance	
I26/E24	01/11/2016	Challenges, limitations of SPEs, SPEs in Nuclear, security Package, governance and finance	
I27/E25	16/11/2016	Challenges, limitations of SPEs, SPEs in Nuclear	
I28/E26	18/11/2016	SPEs in Nuclear, security package, governance and finance	

Data Analysis

Coding: As typical in GM, the transcripts of the interview and secondary data were coded. At the beginning of the research, the open coding was used (Corbin and Strauss, 2015). During the later stages, axial and selective coding permitted to refine the emergent concepts. The coding activity was supported by NVivo10 (Bazeley and Jackson, 2013).

Theoretical Conceptualization: the emergent theory was conceptualized interconnecting the main concepts resulting from coding. The casual relationships were formulated consistently with the information provided by the interviews. The reflexive process permitted to integrate the concepts into a unifying theory and was documented using memos.

Testing and Review

The interactive process continues until:

- Coded concepts are sufficiently described. The review considers the completeness and density of the codes. These two features are judged in relation to the requirement associated with them. Some concepts are central to the study and require higher details with respect other less relevant concepts.
- The emergent theory is primarily judged using the theoretical saturation principle (Eisenhardt, 1989; Corbin and Strauss, 2015; M. N. K. Saunders, Lewis and Thornhill, 2015). If the research includes gaps the next steps of the GT focus on them thanks to the theoretical sampling. The authors included specific tests to judge the quality and completeness of the emergent theory.

CRITICISM, RIGOR AND VALIDITY OF THE RESEARCH

The ultimate delivery of the research is an interpretivist theory. Theories consist of “categories (themes, concepts) that are systematically developed in terms of their proprieties and dimensions and interrelated through statements of relationship to form a theoretical framework that explains something about a phenomenon” (Hage, 1972). Traditionally, theories are

characterized by specific quality requirements concerning their “utility” and their “falsifiability” (Whitman and Woszczyński, 2004).

The author adopted a pragmatist- interpretative paradigm, which assumes that the world is subjective and reality is socially constructed (Whitman and Woszczyński, 2004). This paradigm implies that the research phenomenon cannot be defined objectively according to a set of absolute criteria. The interpretative standpoint necessitates a different notion of rigor, which considers different criteria with respect the positivistic tradition as summarized in **Error! Reference source not found.** The last column of this table presents the questions that need to be positively answered in order to justify the results.

Table 6: Alternative quality requirements for interpretative theories (Whitman and Woszczyński, 2004)

Issue of concern	Positivist Worldview	Interpretative Worldview	Test questions
Representativeness of the findings	Objectivity: findings are free from researcher bias	Confirmability: conclusions depend on subject and conditions of the study, rather than the researcher	Considering the different source of data collected and analyzed, was the theory cross-confirmed in any of its concept and construct? Was the reflexive process sufficiently complete and explicit?
Reproducibility of findings	Reliability: the study findings can be replicated, independently of context, time or researcher	Dependability/ Audibility: the study process is consistent and reasonably stable over time and between researcher	Was the method described in detail? Was the method followed in detail? Was the reflexive process described and documented with sufficient detail?
Rigour of method	Internal validity: a statistically-significant relationship is established, to demonstrate that certain conditions are associated with other conditions, often by "triangulation" of findings	Internal consistency: the research findings are credible and consistent, to the people we study and to our readers. For authenticity, our findings should be related to significant elements in the research context/ situation	Was the empirical evidence sufficiently connected to the research results? Was the inductive process sufficiently explicit and documented?
Generalisability of findings	External validity: the researcher establishes a domain in which findings are generalizable	Transferability: how far can the findings/ conclusions be transferred to other contexts and how do they help to derive useful theories?	Is the theory representative of a sufficiently large context? Are the contextual factors sufficiently clarified and formalized?

RESULTS

The result section describes the findings of the research in relation to each of the four ROs. The four ROs are mutually interconnected. The first RO provides a general classification of SPEs that is used for the second RO. The second RO distinguishes among four main types of SPEs that are used in megaprojects. These types of SPEs permitted to address the RO3 that is about their functions for the megaproject. Finally, the RO4 explains how SPEs influence the governance of infrastructure megaprojects. RO4 is based on the distinction between the different types of SPEs (RO2) and their associated functions (RO3). The following sub-sections describe in detail the four main results of the research.

RO1 – TO CLASSIFY THE EXISTING TYPES OF SPEs.

In literature, SPEs are defined and described differently depending on the context considered. The literature review identified three main streams, corresponding to the following knowledge domains: legal, financial and project management. Each of these domains focuses on very

different types of SPEs. Regardless of these differences, all SPEs have three features in common:

1. They are fenced entities;
2. They have limited and pre-defined purposes;
3. They have a legal personality.

Overall, the research focuses on the types of SPEs employed in megaprojects, and in particular the ones playing a critical role in their governance. To identify these types of SPEs, the research introduces a classification encompassing all types of SPEs, including the ones unrelated to the project management domain. The classification is a first result that permitted to identify and differentiate the types of SPEs that are relevant for the research.

Classification

The classification was obtained by coding and structuring the distinguishing characteristics of SPEs. The researchers considered several examples of SPEs described in the literature. The sample of examples of SPE was selected to be sufficiently broad and heterogeneous to make classification suitable for the three knowledge domains considered, namely legal, financial and project management. The inclusion of additional examples of SPEs terminated in accordance with the theoretical saturation principle. In particular, the last SPEs considered did not add any new SPE features compared to the ones previously identified.

The coded features were grouped into homogeneous clusters called “SPE features”. As a result, the classification is structured into two hierarchical levels.

The first level comprises of the “SPE features”. The research identified ten main SPE features, namely: legal status, lifetime, purposes, activities, capabilities assets and liabilities, financial structure, risk characterization, ownership and control, reporting and accounting, and venue. These features provide different perspectives by which the SPEs can be compared.

The second level comprises with the possible “values” associated to any of the ten SPE features. For example, the SPE feature labelled “legal status” can be associated to one of the following values: limited liability company, corporation, general partnership⁵, limited liability partnership¹, mutual fund, or trust. The values associated with the SPE features are not necessarily mutually exclusives. For some SPE features, more values can coexist together. For example, the SPEs can undertake multiple activities.

Error! Reference source not found. presents the classification of the existing SPEs. **Error! Reference source not found.** highlights three distinctive characteristics in common to any SPE, namely: "fenced entities", "limited and pre-defined purposes" and the "legal personality". These three characteristics are common across the three knowledge domains considered, and they define the SPEs.

⁵ Only in those jurisdictions where the partnership has legal personality.

Table 7: Classification of the existing SPEs

SPE FEATURES (Clusters)	POSSIBLE VALUES ASSOCIATED TO THE SPE FEATURES (Codes)
1- Legal Status	SPE has legal personality
	Limited Liability Company
	Limited Liability Partnership
	Mutual Found
	Corporation
	Trust
2- Lifetime	Defined and Limited
	Perpetual
3-Purposes	Pre-defined Purposes
	Apparent profit-making motive
	Structured Finance
	Tax optimisation
	Price arbitrage
	Balance Sheet management
	Partnering and alliances
	Isolating and homogenizing cash flows and business risk of a specific asset, asset-class
	Eases Asset Transfer
	Deals with legal and regulatory requirements
4- Activities	Insulation of Risk, Assets, Liabilities or Cash Flows
	Risk Transfer, sharing and spreading
	Risk Transformation
	Securitisation (assets & liabilities)
	Project Financing
	Leasing
	Commercial or fake transaction (i.e. not true sales)
	Channelling, retention and exchanging of rights, licenses, permits
	Channelling cash Flows
	Infrastructure Related Activities (design, deliver, finance, operate, etc.)
5- Capabilities, Assets, and Liabilities	Absence of Physical Assets
	Financial assets and liabilities
	Intangible assets (E.g. Rights, licenses, Royalties, patents, etc.)
	Human-related Assets
	Physic Assets
6- Financial Structure	High Depth/Equity Ratio
	Collateralized Finances
	Semi recourse Financing

	Non-recourse Financing
7- Risk characterisation	Bankruptcy remoteness
	Low probability of insolvency
	Repackaging of the risk profile
	Fenced organisation
8-Ownership And Control	Self-fenced\Orphan organisation
	Shared/ distributed ownership
	Public and Private Parties (PPP) involved together into the SPE
	Passive management (e.g. autopilot mechanisms)
	External management (directors, trustee, external administrators, etc.)
	The entity is primarily owned by one or more financial institution
	The entity is primarily owned and controlled by infrastructure-related companies (e.g. Utilities, contractors, etc.)
9- Accounting	Intentionally an Off-Sheet Instrument (with respect parent organizations)
	Variable Interest Vehicle (FIN 46)
	Qualified Special Purpose Vehicle (FAS 140)
10-Venue	Resident in off-shore jurisdictions
	The venue is located where the SPE undertakes his activities
	SPE has a physical location

RO2 – TO IDENTIFY WHICH TYPES OF SPEs PLAY A CRITICAL ROLE FOR THE GOVERNANCE OF MEGAPROJECTS.

The general classification addressing the RO1 permitted to differentiate and cluster the SPEs involved in infrastructure megaprojects. A preliminary classification was drafted starting from examples available in the megaproject literature, including exemplifying case studies. The interviews with the experts expanded and refined the analysis.

Four main types of SPEs are involved in infrastructure megaprojects, namely: industrial vehicle, project company, vehicle, project company, intermediate SPEs, and jurisdictional shell companies. Table 8: Types of SPE involved in the governance of megaprojects. LEGEND:A=Always, U=Usually, UN=Usually Not, S= Sometimes, R=Rarely, N=Never

describes and compare in detail these types of SPEs adopting the SPE classification introduced in the previous section.

Firstly, industrial vehicles comprise with those SPEs undertaking physical activities associated to megaprojects; usually, construction, operation & maintenance or both. Typically, industrial vehicles are incorporated joint ventures. Industrial vehicles are comparable to consortiums; nevertheless, they have legal personality. The research confirmed that industrial vehicles play a relevant role in the governance of megaprojects, particularly if they are set up to regroup critical stakeholders such as: the main contractor, the technology provider, the operator, the critical suppliers and, sometimes, public administrations.

Secondly, project companies are used as financing and ownership vehicles. In the megaproject literature, project companies are widely disseminated, particularly concerning

their financing and contractual role. Project companies support any project finance transaction as they are used as the vehicle to structure the financial and contractual framework. Project companies are critical for the governance of megaprojects. Together with other contractual instruments, project companies set up fundamental decision-making roles and institutions for the megaprojects. The board of directors of the project companies often includes a representative of the most relevant stakeholders, including: public institutions and other critical industrial stakeholders. Often, the board of director acts as the steering committee for the megaproject. The complex contractual nexus underlying the project companies determines the roles and the responsibilities associated to the critical stakeholders; additionally, it shapes the decision-making procedures for critical decisions, such as replacing a critical contractor, changing the project budget, extending the project deadline, refinancing the project debt, etc. Typically, project companies are very dynamic and evolve throughout the megaproject lifecycle. During the initial phases of the megaproject, they govern prevalently intangible assets and capabilities. Often at this stage, the only personnel available is the board of director or limited supporting staff. Sometimes, during the operation, the project companies evolve to undertake more operative activities such as the operation of the infrastructure megaproject. In such circumstances, the project companies reconfigure themselves regarding business model, governance framework, internal policies and organisation.

Thirdly, intermediate SPEs are used to optimise the project finance transactions, particularly concerning aspects such as: tax, accounting, finance and risk management. The structuring of intermediate SPEs adopt complex private equity schemes. Intermediate SPEs are often ignored in the megaprojects literature. However, in some circumstances, they can play a relevant role in the governance of megaprojects. Intermediate SPEs are often used to control the megaprojects. Often, they provide isolation for specific risks and liabilities arising from the megaproject. Intermediate SPEs structure complex ownership and decision-making framework for project companies (i.e. the type of SPEs previously described), which are critical for the governance of megaprojects. Typically, intermediate SPEs are intangible in nature and they are used as legal construct to invest and control the project companies or the industrial vehicles. Often, intermediate SPEs do not have any personnel and they are controlled by external managers (i.e., not employed by the intermediate SPEs), without having a physical venue, but only a legal one.

Fourthly, jurisdictional shell companies are SPEs incorporated in offshore jurisdictions for specific purposes, typically for tax advantages or other accounting reasons. A multitude of jurisdictional shell companies can be set up for a specific megaproject to optimise the transfer of relevant funds dedicated to the megaproject, which are often in different currencies. In most circumstances, jurisdictional shell companies are not critical for the governance of megaprojects. However, there are exceptions where these types of SPEs can have an indirect, role in the formal governance of megaproject. For instance, in cases where these SPEs are incorporated in specific jurisdictions to enhance the enforceability of the contracting framework, or part of it. The incorporation of these SPEs establishes a link with the target jurisdiction, including the available legal framework and the courts. As a result, the financial institutions that are financially exposed have the incentive to apply the legal and jurisdictional system available in target jurisdictions. Their confidence on the target jurisdiction is particularly relevant for the megaproject developed in politically unstable countries. With this respect, some of the most relevant branches of law to be considered are: banking law, propriety rights, corporate law, construction law, contract and tort law.

In summary, there are four main types of SPEs employed in megaprojects, namely: industrial vehicle, project company, intermediate SPEs, and jurisdictional shell companies. The most relevant for the governance are the industrial vehicles, for the operative decision-making,

and the project company for the strategic and financial control. Sometimes, the other two types of SPEs can play an indirect role in the governance of megaprojects.

		TYPES OF SPE INVOLVED IN MEGAPROJECTS			
SPE FEATURES	POSSIBLE VALUES ASSOCIATED TO THE SPE FEATURES	Industrial Vehicle	Project company	Intermediate SPEs	Jurisdictional shell companies
1- Legal Status	SPE has legal personality	A	A	A	A
	Limited Liability Company	U/S	U	S	S
	Limited Liability Partnership	U/S	S	S	R
	Mutual Found	R	R	R	R
	Corporation	S	S	S	S
	Trust	R/N	R	S	U/S
2- Lifetime	Defined and Limited	U	U	S	U
	Perpetual	R	R	R	S
3-Purposes	Pre-defined Purposes	A	A	A	A
	Apparent profit-making motive	U	U	R	R
	Structured Finance	R	A	U	S
	Tax optimisation	S/R	S/R	A/U	A/U
	Price arbitrage	R/N	R/N	S	S
	Balance Sheet management	S	U	A/U	A/U
	Partnering and alliances	A	S	R/N	R/N
	Isolating and homogenizing cash flows and business risk of a specific asset, asset-class	U	A	U	S
	Eases Asset Transfer	S	A/U	U/S	S
	Deals with legal and regulatory requirements	R	U/S	U	R
4- Activities	Insulation of Risk, Assets, Liabilities or Cash Flows	U	A	A/U	S
	Risk Transfer, sharing and spreading	U	A	S	R
	Risk Transformation	S	A	A/U	R
	Securitisation (assets & liabilities)	R/N	S	S	N
	Project Financing	S/R	A	N	N
	Leasing	N	N	S	S
	Commercial or fake transaction (i.e. not true sales)	N	S	U	U
	Channeling, retention and exchanging of rights, licenses, permits	U/S	A/U	S	S/R
	Channeling cash Flows	A/U	A	A	A/U
	Infrastructure Related Activities (design, deliver, operate, etc.)	A	R	N	N
5- Capabilities, Assets, and Liabilities	Absence of Physical Assets	N	R/N	A/U	A/U
	Financial assets and liabilities	S	A	A	A
	Intangible assets (E.g. Rights, licenses, Royalties, patents, etc.)	R	A	S	A/U
	Human-related Assets	A	A/U	R/N	R/N
	Physic Assets	A	A/U	R/N	R/N
6- Financial Structure	High Depth/Equity Ratio	R	A	S	R/N
	Collateralized Finances	S	N	R/N	R/N
	Semi recourse Financing	S	A/U	S	S
	Non-recourse Financing	U/S	U/S	S	S

7- Risk characterisation	Bankruptcy remoteness	U/S	A/U	S	S
	Low probability of insolvency	S	A/U	A/U	A/U
	Repackaging of the risk profile	U	A	U	R
8-Ownership And Control	Fenced organisation	A	A	A	A
	Self-fenced/Orphan organisation	S	A/U	S	A/U
	Shared/ distributed ownership	S	A/U	S/R	R/N
	Public and Private Parties (PPP) involved together into the SPE	A/U	A/U	S	N
	Passive management (e.g. autopilot mechanisms)	N	N	N	N
	External management (directors, trustee, external administrators, etc.)	N	R/N	A/U	A
	The entity is primarily owned by one or more financial institution	N	R	A/U	A/U
	The entity is primarily owned and controlled by infrastructure-related companies (e.g. Utilities, contractors, etc.)	A	A	S/R	S/R
9- Accounting	Intentionally an Off-Sheet Instrument (with respect parent organizations)	A	A	A	A
	Variable Interest Vehicle (FIN 46)	N	S	S	N
	Qualified Special Purpose Vehicle (FAS 140)	N	N	N/S	N
10-Venue	Resident in off-shore jurisdictions	R	R	S	A
	The venue is located where the SPE undertakes his activities	U	U	S/N	N
	SPE has a physical location	S	S	R/N	R/N

Table 8: Types of SPE involved in the governance of megaprojects. LEGEND:A=Always, U=Usually, UN=Usually Not, S= Sometimes, R=Rarely, N=Never

RO3 – TO IDENTIFY THE FUNCTIONS ASSOCIATED TO THE SPEs IN INFRASTRUCTURE MEGAPROJECTS.

- In megaproject, SPEs perform one or more of the following functions:
 - Collect and own assets/liabilities;
 - Isolate and partition: assets/liabilities, risks, responsibilities and accounting information from their originators;
 - Channel and transfer the risk underlying the SPEs assets/liabilities, industrial activities and enforceable responsibilities;
 - Establish relations and embark enforceable responsibilities;
 - Undertake industrial activities (e.g. construction);
 - Manage and govern its underlying assets/liabilities, personnel and activities;
 - Provide access to a specific legislation and jurisdiction by their incorporation in specific countries.

These functions are directly derived from the definitional features of SPEs, namely: *legal personality, pre-defined purposes and fenced organisation*. In particular, the legal personality is a differential feature that is not available by other enforceable instruments such as contracts, consortiums, concessions, securities, etc. This feature allow SPEs to own and isolate assets and liabilities (and the risks associated with them), and also to embark contractual relationships, undertake responsibilities, etc.

Each type of SPE described in the previous section fulfils most of these functions. However, the different types of SPEs fulfil these functions differently and to different extents. Table 9 summarises the specific functions of each type of SPE involved in megaprojects, namely: industrial vehicle, project company, intermediate SPEs, and jurisdictional shell companies.

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Table 9: Functions of each type of SPE involved in megaprojects

Types of SPEs involved in Megaprojects				
Functions of the SPEs	Industrial Vehicle	Project company	Intermediate SPEs	Jurisdictional shell companies
Collect and own assets/liabilities	Sometimes, the physical asset and the personnel required to undertake the industrial activities	Critical for the intangible assets/ liabilities: funds, insurances, concessions, licenses, etc. Project company requires a limited personnel, the board of directors and a reduced supporting staff.	Prevalently financial assets and liabilities	Prevalently intangible assets and liabilities
Isolate and partition: assets/liabilities, risks, responsibilities and accounting information from their originators	Isolate and partition the risks and responsibilities associated with the industrial activities undertaken	Structural and systemic for the whole megaproject.	Critical. The intermediate SPEs are used to separate the originators from the project company and industrial vehicles. The isolation is local rather than systemic as it focuses on a single, hierarchical controller-controlled relationship. Additionally, intermediate SPEs are used to partition the owners and investors of the project company.	The isolation is critical for accounting and tax related purposes. The isolation considers prevalently intangible assets and liabilities.
Channel and transfer the risk underlying the SPEs assets/liabilities, industrial activities and enforceable responsibilities	Limited.	Critical. Usually the Project company channel and transfer "all or most of (i.e. the maximum extent) the megaproject risks to external stakeholders by mean of contracting instruments and insurances. The project company is used as a hub to transform and transfer the megaproject risk between the stakeholders.	Relevant. The cross ownerships of the intermediate SPEs, associated with the industrial vehicle or project company, provides the mechanism to channel the risk to the investors of megaprojects. Usually, the use of additional contracting mechanisms is reduced for intermediate SPEs.	Reduced. Jurisdictional shell companies are used prevalently for tax and accounting purposes rather than for the risk management.
Establish relations and embark enforceable responsibilities	Critical for the industrial activities undertaken	Critical to "Collect and own assets/liabilities" and to "Channel and transfer the risk"	Mainly the relationship of control of equity investors of either the industrial vehicle or the project company	Critical to interlink the megaproject, some critical stakeholders and their contractual relationship to a specific jurisdiction. Jurisdictional shell companies provide the
Undertake industrial activities (e.g. construction)	Critical. The activities undertaken depends on case to case basis. Often the industrial vehicle undertakes either the construction or the operation of the infrastructure megaproject. Sometimes the industrial vehicle devoted to the operation can also be a project company.	Sometimes the project company evolves and become operator. In this scenario, the project company is also an industrial vehicle performing the operating activities. The construction activities are always separated to the project company because perceived too risky for the financial institutions. As a result, the construction risk needs to be transferred to stakeholders others than the project company.	Rarely/ never	Rarely/ never
Manage and govern the underlying assets/liabilities, personnel and activities	Govern the personnel and the industrial activities undertaken	Govern and manage the intangible assets and liabilities.	The cross-ownership of intermediate SPEs allows to govern, indirectly, the industrial vehicle and the project company. This governance function is for the equity investors of either the industrial vehicle or project company	Almost null.
Provide access to a specific legislation and jurisdiction by their incorporation in specific countries	Often, the industrial vehicle is incorporated in the same jurisdiction where the activities take place for legal and regulatory reasons.	Sometimes, the project company is incorporated in the same jurisdiction where the activities take place for legal and regulatory reasons.	Sometimes critical. Some intermediate SPEs can act as "jurisdiction shell companies". In such circumstances, the "access to a specific legislation and jurisdiction" is a pivotal function associated to the SPE.	Critical to access jurisdictions enhancing the certainty and predictability of the legal context, and the enforceability of the contractual obligations. Critical for tax optimisation and other accounting purposes.

RO4 – To UNDERSTAND HOW THE SPEs INFLUENCE THE GOVERNANCE OF INFRASTRUCTURE MEGAPROJECTS.

Megaprojects involve several project stakeholders like clients, contractors, financiers, etc. They have different and often conflicting objectives toward the common megaproject escalating the organisational complexity jeopardising an effective governance. Traditionally, this has been tackled by prescriptive contracts or similar enforcing instruments, such as the concessions.

The SPE is a legal construct providing unique features complementing the traditional contracting instruments. SPEs, together with the traditional contracting instruments, enable to:

- Cluster and institutionalise homogeneous class of project stakeholders. The research identifies three key clusters: investors, developers and operators;
- Provide governance instruments available in the corporate governance, including the state of the art of the implied rules of law. The corporate structures provide more flexible and amendable governance mechanisms compared to traditional contracting instruments. This enhanced flexibility is frequently used to reshape the governance during the megaproject development.
- Establish contractual hubs that change the topology of the contracting network. These hubs reduce the contractual distance between project stakeholders. Technically, they behave such as “small world networks”. For instance, this eases the protection of the security interest and improve the governability of the network.
- Provide flexible and resilient enforcing instruments, able to identify and isolate project risks and responsibilities. This enables to manage and assign residual or unforeseeable project risks that cannot be handled with traditional contracting instruments. This propriety enhances the contractual certainty and predictability of project network.

Main advantages for the governance of megaproject derived from the incorporation of SPEs

Because of features previously described, SPEs have the potential to improve the governance of megaprojects; in particular:

- Improve the risk management and attribution of responsibilities;
- Improve the flexibility, particularly the transfer of ownership and control of the megaproject (or part of it);
- Provide single/s point/s of megaproject responsibility;
- Improve the contractual certainty and predictability for critical megaproject stakeholders;
- Ease the security interest.

The contracting paradigm has limited direct implications for the operational governance of megaprojects. Usually, the extent to which the project leader and his or her team are affected by the SPE-network is limited in normal physiological conditions.

Conversely, if the megaproject suffers major problems, the SPE-network paradigm has a significant impact on the project leader and their team. Pathological conditions include major delays, significant over-budget, defaults of relevant contracts, parties' litigation or the bankruptcy of a major project stakeholder. In such circumstances, a contingent and alternative contracting network is triggered, and a significant shift of responsibilities usually take place in favour of the financial institutions; particularly, the syndicate of banks. This alternative contracting network is part of the security package providing the necessary recourse to the main financiers. The security package includes the so-called direct contacts and often an additional SPE (i.e., an alternative project company) under the control of the financial institutions. When the security package is activated, the financial institutions take control over the governance of the megaproject and appoint independent experts and managers to limit their financial losses.

Disadvantages associated with the use of SPEs

According to the experts interviewed, the main shortcomings lay on the complexity, the time and cost required to negotiate and design organically the SPEs and their associated contracting instruments. In megaprojects, the SPE-contracting framework implies a systemic and multilateral negotiation and due diligence. Several critical stakeholders take part of this negotiation, including: public institutions, private contractors, suppliers, technology providers, operators, financial institutions, insurances, etc.

Conversely, the traditional contracting instruments alone provide simpler structures and an easier negotiation context. Fundamentally, they are based on bilateral contractual relationships. For example, the relationship between the sponsor and the financial institutions, the project client and the main contractor, etc.

Bilateral negotiations allow decoupling the whole megaproject transaction into a multitude of bilateral contractual links. As a result, the traditional contracting paradigm simplifies the negotiation between project stakeholders.

Consistently, the main disadvantage attributable to SPEs lies on the cost, time and complexity associated with their negotiation and due diligence.

Linking governance and project performance

The negotiation and the set-up of the SPE-network requires an extensive negotiation and due diligence process which can last years. This process is led by the steering committee that includes several organisations belonging to three main categories: public institutions, financial institutions and industrial sponsors. The interviews confirmed that financial institutions have stronger bargain power at the time of the SPE-network is negotiated. Usually, the SPE-networks is used to support project finance transactions, characterised for their prevalent use of debt (i.e., high financial leverage). The resulting SPE-network, and the contingent security package are usually designed to assure the financial institutions, i.e. to enhance the debt security interest. The prevailing negotiation power of financial institutions have other important implications for the megaprojects:

- Financial institutions force the other parties (particularly the financial sponsors) to provide an extensive Front-End Engineering Design. In project management literature, the improved Front-End Engineering Design is often described as the key recipe for better megaprojects;

- Financial institutions are reluctant to finance risky and non-bankable megaprojects. They provide an independent and deep financial review which can result in the desertion of weak (financially) megaprojects before any significant financial commitment. This review explains a better selection process which partially explains the improved economic performance of megaprojects involving critical SPEs.
- Financial institutions force a more effective and explicit risk identification and transfer among the critical project stakeholders. The emphasis on the debt security interest explains this phenomenon.
- Financial institutions advocates for more complex and sophisticated financial techniques, which provide an important revenue stream for them due to the increased fees.

All these aspects explain the improved economic performance found by the Megaproject Cost Action (Brookes and Locatelli, 2015; Locatelli *et al.*, 2017; Locatelli, Invernizzi and Brookes, 2017).

CONCLUSIONS

The research addressed the four research objectives, namely:

- RO1 - To classify the existing types of SPEs.
- RO2 - To identify which types of SPEs play a critical role in the governance of megaprojects.
- RO3 - To identify the functions associated to the SPEs in infrastructure megaprojects.
- RO4 - To understand how the SPEs influence the governance of infrastructure megaprojects.

In particular, the research provides four main contributions to knowledge:

1. It provides a general classification tool to compare different types of SPEs;
2. It identifies the main types of SPEs involved in infrastructure megaprojects. Additionally, the research clarifies which type of SPE plays a role in the governance of megaprojects;
3. It explains what SPEs do for the megaprojects. The research describes the specific functions of every type of SPE previously identified;
4. It explains how SPEs affect the governance of megaprojects, including the implications for their performance.

Firstly, the research introduces a general classification to compare different types of SPEs. The *literature review* showed that SPEs are defined and described differently depending on the knowledge domain considered. The research provides a classification embracing all the knowledge domains and the types of SPEs. The classification provides a common ground to distinguish different types of SPEs within and between the knowledge domains considered. The classification is instrumental to the second deliverable of the research. Regardless of the

specific instrumental use of the research, the classification can be used by analysts and academics to compare different SPEs with limited information available.

Secondly, the research describes the main types of SPEs involved in megaproject, namely industrial vehicle, project company, intermediate SPEs, and jurisdictional shell companies. In doing so, the research emphasises the role of these types of SPEs for the governance of megaprojects. Often in megaproject literature, SPEs are treated and considered indistinctly. The actual research shows that there are very different types of SPEs that should be distinguished, as they have very different implications for the governance. This second deliverable provides the grounds for a better understanding of the complex subject of contracting in megaprojects. It also provides the basis for further academic research on the topic.

Thirdly, the research highlights the main functions played by the SPEs for megaprojects. In doing so, the research distinguishes between the different types of SPEs previously identified. The research shows that different types of SPE fulfil very different functions for the megaproject, particularly in governance terms. This research contribution clarifies what SPEs do for the megaprojects. The interviews with the experts confirmed that SPEs provide unique contracting advantages at the cost of additional complexity, negotiation time, and cost. Sometimes, megaproject contractors, or clients, prefer to avoid this complexity because SPEs are understood only by highly qualified legal and financial experts. A better understanding of SPEs would permit to a wider, and better, use of these instruments.

Finally, the research explains how the SPEs affect the governance of megaprojects, including the implications for their performance. SPEs provide complementary features to be mixed with the other contracting instruments. Together, the SPEs and the other contracting instruments, permit to create alternative megaproject transactions or to optimise the existing contracting paradigms. SPEs can act as contractual hubs, changing the traditional contracting network topology. SPEs are formally incorporated organisations; their use provides unique features compared to the other contracting instruments. Among the others, these features include the enhanced flexibility, the access to implied rules of laws (enhancing the enforceability and certainty of contractual transactions), etc. The unique features provided by SPEs are particularly relevant for the investors of megaprojects. In addition to the fiscal and accounting advantages, SPEs provide unique governance mechanisms for the investors. Concerning the impact of the megaproject performance, the research concludes that SPEs forces a systemic negotiation and due diligence before the financial closure. During the initial planning, this constrain results in delays and extra costs compared to the traditional contracting paradigm. Conversely, the enhanced negotiation force the critical stakeholders to anticipate the resolution of problems, to produce more reliable feasibility studies, and to design more resilient governance structures and processes. According to the experts interviewed, this permit to a better selection of megaproject (before the financial closure) leading to better performance during the operation.

The current research does not intend to promote SPEs indiscriminately. The incorporation of SPEs is more costly, and time-consuming, compared to other traditional contracting instruments. Additionally, SPEs can create complex megaproject transactions that are less intelligible for the public, and often for the other stakeholders including: industrial practitioners, public institutions and academics. SPEs can be easily misused to perform opportunistic behaviours. Examples of misuse include: tax evasion, lack of transparency, inefficient transfer of risk, conflict of interest and corruption.

The research has three main implications for academics and industry practitioners.

Firstly, it paves the way for a relevant, and under-investigated, topic: the governance role played by SPEs in megaprojects. The term SPE is often mentioned without a sufficient deepening, and rarely is it the unit of analysis. The research highlights that some types of SPEs play a central role in the governance of megaproject. Therefore, the research advocates for further researches on this relevant topic for the project management community.

Secondly, the research brings together two relevant domains that are often kept separated in terms of education, research and academic publications; in particular, the legal and the project management domains. In practice, megaprojects bring together several cross-disciplinary aspects. The governance of megaprojects relays strongly to the legal and project management domains. This research highlights how some legal provisions (such as: the issue of incorporations, the legal personality, voting provisions within the SPEs) affect the project management. The authors advocate for a more explicit disseminations of cross-disciplinary issues that play a relevant role in practices but are kept separated by the existing traditions and education frameworks.

Thirdly, the research makes explicit tacit knowledge employed by lawyers to shape the governance of infrastructure megaprojects. The research brings relevant insights for the project management community. The authors believe that a better awareness of cross-disciplinary issues (such as the topic of study) would improve the interaction between lawyers and project managers, improving the governance of megaprojects and therefore their performance.

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