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# 1    **Types and Functions of Special Purpose Vehicles in** 2                                    **infrastructure megaprojects**

## 3    **Abstract**

4    Special Purpose Vehicles (SPVs) are legal instruments, widely employed in infrastructure  
5    megaprojects. SPVs support specific transactions, including public-private partnerships and  
6    project finance. Despite the widespread use of SPVs, there is limited research concerning  
7    their importance and role for project governance. Furthermore, project studies don't  
8    distinguish between the different types of SPVs. This paper employs a grounded theory  
9    approach to understand the four types of SPVs and their functions for transactions in  
10    infrastructure megaprojects. This paper shows that specific types of SPVs, called project  
11    companies and industrial vehicles, are relevant for the formal governance of infrastructure  
12    megaproject. The paper describes the hybrid nature of SPVs, being between corporations and  
13    contracts, and discusses the implications for the transaction cost theory. A better  
14    understanding of the types and functions of SPVs will facilitate and enhance the design and  
15    negotiation of the formal governance of infrastructure megaprojects.

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19    **Keywords:** Special Purpose Vehicle (SPV), infrastructure megaproject, governance, Public-  
20    Private Partnership (PPP), Project Finance (PF).

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1 **HIGHLIGHTS**

- 2 • SPVs is a hybrid instrument combining features of both contracts and companies, which  
3 are under-investigated in project studies
- 4 • SPVs are frequently used in project finance and public-private partnership, and they can  
5 play a relevant role in the governance of infrastructure megaprojects
- 6 • This paper explains what SPVs do for projects; it presents the types and functions of those  
7 SPVs involved in infrastructure megaprojects
- 8 • A comprehensive understanding of what SPVs do for the project is essential to negotiate  
9 and design the project governance

10

# 1 Introduction

2 Special Purpose Vehicles (SPVs) are “*fenced organisations having limited pre-defined*  
3 *purposes and a legal personality*” (Sainati et al., 2017, p. 58). SPVs are also known as  
4 Special Purpose Entities (SPE), shell companies and project companies. SPVs are legal  
5 persons (e.g. corporations, limited liability companies) engineered to serve specific purposes  
6 and transactions (Dentons, 2016), which are widely used in different contexts, including  
7 finance, tax optimisation and projects. In finance, SPVs are used for “structured finance  
8 transactions” (Caselli and Gatti, 2005), such as securitisation. In private equity, SPVs are  
9 instrumental for mergers and acquisitions of corporations and transactions alike (Cumming,  
10 2012; Gatti, 2018). SPVs are also associated with scandals with off-shore companies  
11 established in tax-heavens for tax evasion and money laundering (Alexander, 2016).

12 This paper focuses on SPVs in projects, where, SPVs are incorporated either as project  
13 organisations (e.g. project client or main contractor), or to enable specific financial  
14 transactions including leasing and securitisation (Fabozzi, 2012). SPVs are widely used in  
15 Public-Private Partnerships (PPPs) and Project Finance (PF) (Akintoye et al., 2008; Delmon,  
16 2009). SPVs are critical instruments supporting the business models of PPPs (Lee and Yu,  
17 2011), in particular for credit enhancement (Chowdhury et al., 2015; Li et al., 2017). SPVs  
18 can share risks between public and private institutions in PPPs (Brookes et al., 2017; Smyth  
19 and Edkins, 2007; Sobhiyah et al., 2009; Wu et al., 2016), and are essential for all PF  
20 transactions to withhold and ring-fence financial resources (Dewar, 2011; Tan, 2007; Vinter  
21 et al., 2013).

22 PPP and PF transactions employ similar types of SPV as off-balance sheet vehicles for the  
23 financing and ownership of project infrastructures (Esty, 2008; Vinter, Price & Lee, 2013;  
24 Finnerty, 2013). In these scenarios, a new company (i.e. SPV) is incorporated to collect,  
25 isolate and convey the funds for infrastructure projects. The SPV is not reported on the

1 balance sheet of the sponsors; making the SPV an “orphan entity” (Basel Committee on  
2 Banking Supervision, 2009). This scenario is opposed to the “on balance sheet” financing  
3 (also known as corporate financing), where the sponsors borrow the funds directly from the  
4 lenders.

5 Project studies consider SPVs mainly as technical instruments in legal, financial and  
6 accounting terms (Daube et al., 2008; Grimsey and Lewis, 2002; T. Liu et al., 2016).  
7 Although other technical legal instruments (e.g. contracts, concessions) have been widely  
8 discussed in project studies, there is limited research concerning SPVs (Brookes et al., 2017;  
9 Sainati et al., 2017). In particular, there is a gap in knowledge concerning the role-played by  
10 SPVs for project transactions. This gap in knowledge is meaningful, because SPVs are widely  
11 employed in large projects, and they are essential to realising specific project transactions and  
12 governance structure in PPPs and PF (Esty, 2008; Fabozzi, 2012; Gatti, 2018).

13 To study SPVs in projects, the authors focused on infrastructure megaprojects defined as  
14 *“Megaprojects are the delivery model used to produce large-scale, complex, and one-off*  
15 *capital investments in a variety of public and private sectors. With a total capital cost of*  
16 *US\$1 billion or more, megaprojects are extremely risky ventures, notoriously difficult to*  
17 *manage, and often fail to achieve their original objectives”* (Denicol et al., 2020, p. 1). SPVs  
18 are more frequently involved in large projects (rather than small ones) because such projects  
19 require bespoke transactions that cannot be formalised with conventional contractual  
20 instruments (Brookes and Locatelli, 2015; Fabozzi, 2012; Gatti, 2018). Small projects rarely  
21 involve SPVs, as their negotiation and due-diligence would be too expensive, and because  
22 small construction companies typically lack the expertise to design and negotiate complicated  
23 legal and financial structures associated to SPVs (Sainati et al., 2017). Furthermore, SPVs are  
24 usually associated with PPPs and PF tractions that are typical of large infrastructure projects.  
25 Therefore, infrastructure megaprojects are ideal for studying SPVs.

1 This paper addresses the following research questions:

2 **RQ1:** *What functions do SPVs provide for infrastructure megaprojects?*

3 Project studies literature is unclear about the role of SPVs in infrastructure megaprojects. This  
4 paper introduces the concept of “functions” to focus on the instrumental nature of SPVs for  
5 transactions in infrastructure megaprojects.

6 **RQ2:** *Which types of SPVs are employed in infrastructure megaprojects?*

7 There are different types of SPVs. The research question is designed to classify and  
8 differentiate alternative types of SPVs in infrastructure megaprojects.

9 Answering these questions overcomes the inherent ambiguity of understanding the role  
10 played by SPVs in infrastructure megaprojects, which is relevant for two main reasons.  
11 Firstly, it allows for the better design of the governance of infrastructure megaproject, which  
12 is critical for their performance (Muller, 2017; Riis et al., 2019; Samset and Volden, 2016).  
13 Secondly, explaining the roles of SPVs will raise awareness among stakeholders such as  
14 policymakers and public officials.

## 2 Theoretical background

### 2.1 The Formal governance of infrastructure megaprojects

The project governance literature describes how project sponsors steer the decision-making for project management (Samset and Volden, 2016), and considers multilevel aspects and practice norms (Brunet, 2019; Brunet and Aubry, 2016). Governance provides the decision-making structures and processes affecting the capabilities, value creation and knowledge transfer associated with megaprojects and their stakeholders (Aerts et al., 2017). Project governance defines both the organisational structures and processes to govern the project (Biesenthal and Wilden, 2014; Nielsen, 2010) assigning project roles and responsibilities to project stakeholders (Ahola et al., 2014; Müller et al., 2016). This paper considers as project stakeholders organisations having a “*legitimate claim in a project*”; in particular, a legal, or contractual, claim in a project (Morris and Pinto, 2010, p. 272). The relevance of governance for stakeholders and the project success has been addressed in the literature dedicated to PPPs, (Chan et al., 2010; Liu and Wilkinson, 2014; Martins et al., 2011). In PPPs, governance provides control and confidence to investors playing a critical role in attracting private investments and making megaprojects bankable (Wang et al., 2019). Additionally, governance enables sponsors to extract value from megaprojects (Riis et al., 2019).

Traditionally, governance research in infrastructure megaprojects dealt with formal aspects (formal governance), as well as social and cultural-cognitive aspects (Hueskes et al., 2017; Zou et al., 2014), including relational trust (Benítez-Ávila et al., 2018; Pilkienė et al., 2018; Wu et al., 2017). Formal governance plays a critical and vital role in project studies (Benítez-Ávila et al., 2018; Carbonara et al., 2014; Zou et al., 2014), particularly in infrastructure megaprojects (Qiu et al., 2019).

The formal governance focuses on contracting, including the legal relationship(s) between the project client and contractor(s) (Brunet and Aubry, 2016; Wikström et al., 2010) and the

1 functions provided by contracts (You et al., 2018). As formal inter-organisational governance  
2 mechanism, contracts are effective instruments to mitigate opportunistic behaviours (Malhotra  
3 and Lumineau, 2011). Effective contracts limit the probability of disputes between  
4 contracting parties, which is frequent in infrastructure projects (Chou et al., 2016). In PPPs,  
5 contracts are essential to introduce incentives and maintaining cohesion within the project,  
6 particularly against opportunistic stakeholders (J. Liu et al., 2016; Wang et al., 2018).  
7 Contracts impact project performance by establishing relational rules enabling project  
8 collaboration (Benítez-Ávila et al., 2018; Zenger et al., 2000), and provide three main  
9 functions: control, coordination, and adaptation (Mellewigt et al., 2007; Schepker et al., 2014;  
10 You et al., 2018).

11 In project studies, two main research streams are dealing with contracts (You et al., 2018).  
12 The first stream describes contract features as the result of contextual factors, including asset  
13 specificity, uncertainty and task interdependence (Anderson and Dekker, 2005; Li et al., 2012;  
14 Turner and Simister, 2001; You et al., 2018). For example, higher project uncertainty leads to  
15 more complex contracts (Cruz and Marques, 2013; Leiblein, 2003). The second stream  
16 focuses on different contracts structures and their effects of project performance due to  
17 enhanced collaboration between contracting stakeholders (Du et al., 2016; Poppo and Zhou,  
18 2014; Suprpto et al., 2016; Turner and Simister, 2001; Wang et al., 2017; You et al., 2018)

19 Besides contracts, formal governance is based on a plethora of formal instruments, including  
20 corporations, policies, concessions, and legislation (Biygautane et al., 2019; Carbonara et al.,  
21 2014). SPVs are also formal instruments that are deemed to influence the formal governance  
22 of projects, as further explained by this paper.

23



## 1 **2.2 Transaction Cost Theory in infrastructure megaprojects**

2 This paper employs the Transaction Cost Theory (TCT) because the authors considered it as  
3 the most appropriate theoretical perspective to study SPVs in infrastructure megaproject, as  
4 further discussed in this section. TCT explains that competitive business combines internal  
5 organisational structures with external contracting structures to minimise the cost of goods  
6 and services (Coase, 2000, 1937). TCT focuses on alternative types of transactions, and their  
7 costs, including the cost of negotiation, due diligence, communication and enforcement  
8 (Williamson, 2002). Consistently, TCT explains “*that organizations adapt their governance*  
9 *structures to achieve the lowest possible transaction costs*” (Biesenthal and Wilden, 2014).  
10 According to Williamson, transactions are characterised by intrinsic features including  
11 frequency, specificity, uncertainty, limited rationality and opportunistic behaviours  
12 (Williamson, 1979). These transactions features orientate toward efficient governance  
13 structures, i.e. the ones that minimise the transactions costs internal and external to  
14 organisations (Coase, 1937; North, 1992; Williamson, 1979). Additionally, TCT considers the  
15 governance structure resulting from different transactions including price-adjustments  
16 mechanisms in markets, contracts governance during negotiation and execution, and the  
17 internal governance of corporate organisations, i.e. firms (Williamson, 1981).  
18 TCT originated from the overlap between economics, organisational theory and contract law  
19 (Williamson, 1981). Particularly relevant for this research is the functional analysis embedded  
20 in TCT (Williamson, 1981), which assumes specific governance functions for alternative  
21 formal instruments including contracts, corporate organisations (Müller, 2012; Suprpto et al.,  
22 2016; Wang et al., 2018; You et al., 2018; Zenger et al., 2000). TCT considers the functions  
23 of contracts, focusing on the perspectives provided by classical contract law, neoclassical  
24 contract law and relational contracting (Williamson, 1979). Similarly, TCT considers the  
25 theory of the firm, and in particular, the internal governance structures provided by corporate

1 organisations (Williamson, 1979). Corporations are assumed as endogenous organisations,  
2 requiring reduced negotiation and enforcement (Hart, 1988; Williamson, 1979). In part, the  
3 functional analysis of formal instruments has been considered in project studies, for example,  
4 in considering how contracts deal with uncertainty and opportunistic behaviours (You et al.,  
5 2018).

6 TCT has been widely employed in project studies (Andersen, 2016), particularly to  
7 investigate contracting (Müller, 2012; Müller et al., 2016). There is extensive research  
8 concerning transaction costs in projects. This is justified because transaction costs play a  
9 critical role in defining the project value for its clients and stakeholders (Ahola et al., 2008).

10 Project transactions cost is deemed to be particularly high for several reasons, including the  
11 vast risk and uncertainty associated with projecting transaction (Chang, 2015), and the  
12 relevant front-end cost for the negotiation and procurement, particularly for PPP transactions  
13 (W. Lu et al., 2015). Transaction cost in projects comprises on additional “hidden” costs,  
14 including the cost of hold-up decisions (Chang, 2013; Chang and Ive, 2007), the cost of  
15 mistrusts between contracting parties (Zaghloul and Hartman, 2003), and the cost of dispute  
16 resolution (W. Lu et al., 2015).

17 TCT is relevant for studying governance in projects involving multiple organisations (Ahola  
18 et al., 2014; Biesenthal and Wilden, 2014). TCT played a critical role in defining temporary  
19 organisations and therefore contributed to research in project organising (Turner and Müller,  
20 2003; Winch, 2014). Both contractual and relational governance are deemed to be relevant for  
21 TCT (P. Lu et al., 2015). Concerning contractual governance, TCT has been applied to  
22 investigate the governance associated with prime contracting (Turner and Simister, 2001), as  
23 well as sub-contracting (Chiang, 2009; Tarziján and Brahm, 2014). TCT has also been  
24 employed to addresses “governance trade-offs” between project management and flexibility

1 in projects (de Wit, 1986), or balance control and trusts in projects (Zwikael and Smyrk,  
2 2015).

3 Construction projects are occasional idiosyncratic investments (Williamson, 1979). The  
4 uncertainty characterising construction projects, including the challenge to foresee all the  
5 details of the transaction during the negotiation, requires transaction-specific governance  
6 structures (Williamson, 1979). Turner and Simister, (2001), employed TCT to identify the  
7 most suitable contracting approach in construction projects. TCT is particularly relevant for  
8 studying the governance of PPPs transactions in infrastructure projects (Jin and Zhang, 2011;  
9 van den Hurk and Verhoest, 2015). For instance, TCT has been widely employed to  
10 investigate aspects such as how bundle concessions rights in PPPs (Teo and Bridge, 2017), or  
11 the governance implications of sophisticated financial transactions in PPPs (Devapriya, 2006).

12 The authors employed the theoretical lenses provided by the TCT for four main reasons.  
13 Firstly, SPVs influence the formal governance of projects (Brookes et al., 2017; Esty, 2008;  
14 Sainati et al., 2017; Vinter et al., 2013). In project studies, TCT is one of the most widely  
15 adopted theories to investigate the formal governance of projects (Turner, 2006, 2004, 2009;  
16 Turner and Simister, 2001). Secondly, TCT focuses on transactions, a meaningful unit of  
17 analysis for studying SPVs; since SPVs are created to serve specific transactions, like PF or  
18 securitisation. Thirdly, TCT is suitable in projects characterised by the interactions of multiple  
19 organisations (Ahola et al., 2014), as opposed to projects internal to organisations. This paper  
20 focuses on infrastructure megaprojects which are characterised by the multiplicity of  
21 organisations. Lastly, TCT considers the functions provided by formal instruments; in  
22 particular, corporate vehicles and contracts. However, such functional analysis has never been  
23 applied for alternative formal instruments such as the SPV. Recent research emphasised the  
24 need to further research on hybrid instruments and organisations for the governance of  
25 infrastructure megaprojects (Matinheikki et al., 2019). This paper contributes to TCT

1 explaining the functions provided by alternative types of SPVs for transaction in  
2 infrastructure megaprojects.

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## 1 **3 Methodology**

2 This research employed a pragmatist paradigm comprising of a relativism ontology (Easterby-  
3 Smith et al., 2012, p. 119) and interactionist epistemology (Fisher and Strauss, 1978, 1979;  
4 Geertz, 1973; Strauss, 1991). This research is inductive, and it is based on a grounded theory  
5 approach (Glaser and Strauss, 1967; Glaser, 1998, 1992, 2010), in particular, the version  
6 proposed by (Corbin and Strauss, 2015), which allows the reflection of the authors to derive  
7 research findings.

8 The research method consisted of three main steps: data collection (section 3.1), data analysis  
9 (section 3.2), and review (section 3.3). Consistently with the grounded theory approach, these  
10 steps were not sequential, but rather cyclical. The research continued until the emerging  
11 categories and propositions passed the quality and reliability tests described in the review  
12 step.

### 13 **3.1 Data Collection**

14 The data collection involved open and semi-structured interviews and secondary data  
15 provided by the interviewees. From May 2014 to November 2016, the authors conducted 28  
16 interviews with 26 experts for a total of 1516 minutes of conversation. All interviewees have  
17 more than 15 years of experience in dealing with SPVs in infrastructure megaprojects. The  
18 sample of interviewees included senior lawyers, bankers and SPVs' managers. The  
19 interviewees have experience with international megaprojects in various sectors, including Oil  
20 & Gas, transportation, Energy and Nuclear.

21 Most legal experts interviewed were either senior partners of leading legal firms or general  
22 counsel of relevant organisations involved in planning and delivering infrastructure  
23 megaprojects. The directors of SPVs interviewed, worked for engineering firms, contractors  
24 or operators. Financial experts were either senior bankers or partners of consultancy  
25 companies, e.g. EY, KPMG. The interviewees also included three recently retired experts

1 with a long career in negotiating and procuring SPVs. The interviewees worked in different  
 2 countries characterised by distinctive social and legal norms. Most of the interviewees work  
 3 in global financial centres in Europe, USA and Honk Kong. The data collected showed no  
 4 relevant difference across countries, and all interviewees substantially agreed on the main  
 5 functions and types of SPVs in infrastructure megaprojects. The authors noticed some  
 6 differences concerning the legal and fiscal technicalities (e.g. incorporation, corporate tax)  
 7 that are irrelevant for this paper. Table 1 summarises the background and experience of the  
 8 26 experts.

Code Expert	Background	Experience concerning SPVs role	Experience concerning 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	Regulation	Nuclear
E28	Finance - accounting	Negotiate, insure	Nuclear

9 *Table 1: Sample of the experts interviewed*

1 At the beginning of the data collection, the authors identified an initial sample of experts in  
2 SPVs infrastructure megaprojects: one portfolio manager and three senior lawyers working on  
3 PF and PPPs transactions. At this preliminary stage (i.e. initial four interviewees), the authors  
4 asked open questions concerning the relevance and the role of SPVs for the governance. The  
5 goal was to identify the different types of SPVs and their specific functions for infrastructure  
6 megaprojects.

7 From the fifth interview onwards, both questions and the sample of interviewees were derived  
8 from the theoretical sampling (Corbin and Strauss, 2015, p. 134). For each iteration of the  
9 research method (i.e. data collection, data analysis, review), the authors identified the  
10 concepts requiring additional data collection, either to be defined further or to be cross  
11 confirmed. Consistently, the authors targeted the type of interviewee (i.e. lawyer, financial  
12 expert, manager) based on the concepts requiring further data. Appendix I details the  
13 evolution of the theoretical sampling at different stages of research, showing the questions  
14 asked during the research.

15

## 16 **3.2 Analysis**

17 The authors analysed the transcripts of the interviews, and secondary data provided by  
18 experts, employing both open, axial and selective coding to develop a classification of the  
19 different types of SPVs and their functions for infrastructure megaprojects.

20 Figure 1 shows the process used for open and axial coding (Corbin and Strauss, 2015, p. 61).

21 The authors employed an open coding approach, as described in (Whitman and Woszczyński,  
22 2004, p. 82). Based on the descriptions and exemplifications of the interviewees, the authors  
23 classified the types of SPVs based on their role in the contracting network and their functions.

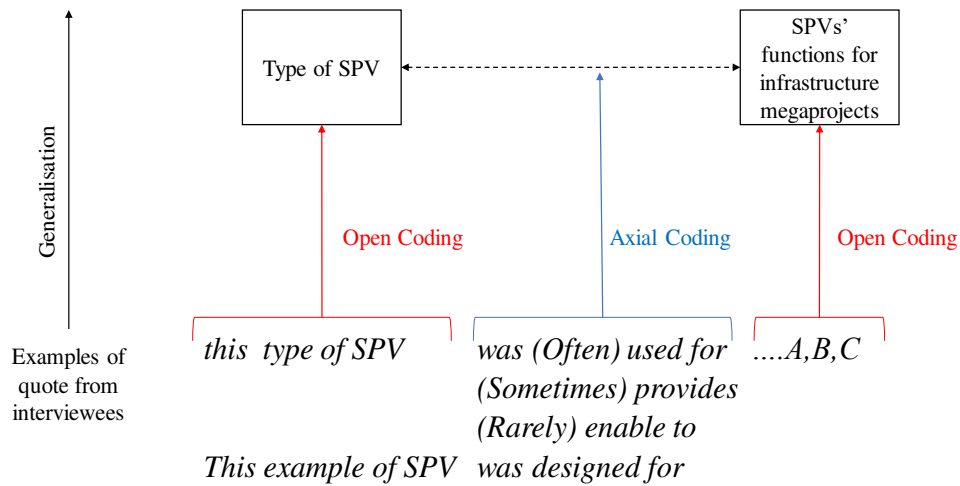
24 Often the interviewees introduced a jargon to distinguish different types of SPVs. The authors  
25 coded the functions associated with SPVs and clustered them according to homogenous

1 groups. Concerning the functions, the authors focused on what SPVs do for their associated  
2 transactions reflecting on what the SPVs can do for infrastructure megaprojects that other  
3 formal instruments (e.g. contracts) or organisations cannot do. To interpret the data, the  
4 authors focused on the intrinsic characteristics of SPVs, and their specific use for  
5 megaprojects leading to three main perspectives: (1) functions that derived from the legal  
6 characteristic of SPVs, (2) functions associated to the role of SPVs for the contracting  
7 network, and (3) functions provided by SPVs in quality of organisations.

8 Axial coding was used to derive the link between different types of SPVs and their functions  
9 interpreting the verb and the emphasis used by interviewees to establish the relevance of  
10 certain functions for specific types of SPVs. The analysis showed that SPVs provide multiple  
11 functions; however, only a few are critical and characterise the specific type of SPV. To  
12 understand the relevance of each function for alternative types of SPV, it was necessary to  
13 consider how often a function is provided by different types of SPV, information that has  
14 been directly provided by the interviews. If a certain type of SPV always provides a specific  
15 function, it means that that function is critical for that type of SPV. Other functions might be  
16 available only sometimes, in some examples and not in others. In this latter case, the function  
17 is not critical for the type of SPV considered. Finally, the authors refined the results using  
18 “selecting coding” to address the specific gaps and inconsistencies of the results (Corbin and  
19 Strauss, 2015, p. 156). The authors processed the data using the software NVivo 11 (Bazeley  
20 and Jackson, 2013; Edhlund and McDougall, 2016).

21





1  
2 *Figure 1: Representation of the open and axial coding process*  
3

### 4 **3.3 Review**

5 To assess the reliability of the findings, the authors employed the approach developed by  
6 (Whitman and Woszczyński, 2004, p. 90), which can be applied to interpretative research,  
7 including the grounded theory approach. A set of questions were used to test the four areas of  
8 reliability criteria:

9 1) representativeness of findings (confirmability)

10 a) Considering the different source of data collected and analysed, were the findings  
11 cross-confirmed in any of its concepts and constructs?

12 b) Was the reflexive process sufficiently complete and explicit?

13 2) reproducibility of findings (dependability/ audibility)

14 a) Was the method described in detail?

15 b) Was the method followed in detail?

16 c) Was the reflexive process described and documented with sufficient detail?

17 3) rigour of method (internal consistency)

18 a) Was the empirical evidence sufficiently connected to the research results?

19 b) Was the inductive process sufficiently explicit and documented?

1 4) generalizability of findings (transferability)

2 a) Is the theory representative of a sufficiently broad context?

3 b) Are the contextual factors sufficiently clarified and formalised?

4 These questions were used for reflecting at the end of each iteration of the research method.

5 During the research, these questions orientated the theoretical sampling and the selection of

6 the next expert to interview. At the end of the last method cycle, the authors agreed that all

7 reliability questions were successfully answered.

## 1 **4 Results**

2 The Grounded theory approach described in the previous session produced two  
3 classifications, (1) functions of SPVs, and (2) types of SPVs in infrastructure megaprojects.

4 The following sub-sections describe these two classifications, answering to the RQs. Section  
5 5 introduces a fictional example to discuss the difference between alternative types of SPVs,  
6 and their functions, in the context of a Liquefied Natural Gas (LNG) megaprojects.

7

### 8 **4.1 Functions of SPVs**

9 Depending on the specific needs, SPVs are engineered to provide specific functions to the  
10 associated transactions. The interviewees suggested differentiating SPVs according to their  
11 functions, which are classified into three homogeneous perspectives legal, contracting and  
12 organisational, as described in the following sub-sections.

13

#### 14 4.1.1 Legal functions of SPVs

15 The legal Functions (LF) functions provided by SPVs derive from the legal significance of  
16 SPVs; this research identified seven main LF.

17 **LF1-Contracting:** SPVs are capable of contractual relationships because of their legal  
18 personality. SPVs can borrow money and hedge risk. The ability to establish contractual  
19 relationships makes SPVs capable of structuring complex transactions.

20 **LF2-Collecting & hiring:** SPVs enable the collection and pooling of a wide range of assets,  
21 financial liabilities and project resources, including hiring personnel.

22 **LF3-Co-owning and investing:** SPVs allows multiple stakeholders to both co-invest and co-  
23 own infrastructure assets.

1 **LF4-Transferring:** SPVs can be used as a vehicle to transfer the ownership of assets. This  
2 function is derived from their legal personality and corporate structure. SPVs can transfer  
3 risks and liabilities associated with a compound of assets and activities.

4 **LF5-Constrainting:** SPVs may have limitations in terms of the use of assets, the ability to  
5 leverage financial liabilities, management’s decision-making power, the ability to embark  
6 upon contractual relationships. These restrictions are consistent with the pre-defined purposes  
7 characterising SPVs.

8 **LF6-Isolating:** SPVs can be used as corporate vehicles to isolate assets, financial and legal  
9 liabilities. This function enables separating ownership, risks and responsibilities from third  
10 parties to SPVs. This isolating function is exploited in PF and PPPs, because it enables to  
11 ring-fence scope of infrastructure project, in legal and financial terms.

12 **LF7-Targeting jurisdictions:** Every SPV is incorporated in a specific jurisdiction, and it is  
13 subjected to the law and judicial system available in that jurisdiction. SPVs can be used as  
14 legal vehicles to target specific jurisdictions. This function can express with the term “forum  
15 shopping”. This targeting function is particularly relevant for those SPVs employed for tax  
16 optimisation.

17

#### 18 4.1.2 Project contracting functions of SPVs

19 The Contracting Functions (CF) of SPVs derive on aspects such as:

- 20 • the role assumed by SPVs, e.g. client, prime contractor, operator
- 21 • the governance structure of SPVs, and the related contractual provisions
- 22 • the transactions involving SPVs, enabling the transfer of risks, cash flows, products and  
23 services between SPVs and third contracting parties.

24 The research identified the following four CFs.

1 **CF1-Channelling risk and responsibilities.** SPVs interlink and bring consistency across  
2 multiple formal instruments, including contracts, public concessions, loans and licenses. SPVs  
3 enables project stakeholders to transfer risks and responsibilities systemically.

4 **CF2-Channelling assets and funds.** SPVs enable multiple exchanges of funds and assets.  
5 Some SPV structures are partially predefined and commoditised, e.g. leasing and  
6 securitisation. More complex transactions, such as PF, require an active and contingent  
7 financial administration and decision-making;

8 **CF3-Transforming risks:** SPVs enable the transformation of project risks, particularly those  
9 arising from their contractual responsibilities and activities. These risks are transformed as a  
10 result of three SPVs' features. Firstly, SPV's legal personality enable to regroup these risks so  
11 that that the SPV's investors are affected by the compound of these risks. Secondly, the  
12 corporate structure of SPVs enables the stratification of these risks in multiple layers,  
13 including equity, quasi-equity and mezzanine junior loan and senior loans. Thirdly, SPVs can  
14 transfer risks to third parties, and adopt hedging instruments like financial derivatives and  
15 insurances.

16 **CF4-Clustering and institutionalising multiple stakeholders.** SPVs can cluster multiple  
17 stakeholders under a common incorporated vehicle. Consistently, SPVs enable performing  
18 joint responsibilities, join activities, to co-invest, to co-own assets, to co-issue debts, etc. For  
19 this reason, SPVs are widely used in PF and partnering.

20

#### 21 4.1.3 Organisational functions of SPVs

22 SPVs are characterised by organisational features, including:

- 23 • the organisational structure;
- 24 • the decision-making processes;
- 25 • the activities performed by SPVs and their outcomes for infrastructure megaprojects.

1 These allow SPVs to provide the following Organisational Functions (OFs) for infrastructure  
2 megaprojects.

3 **OF1-Performing activities:** SPVs can build, operate, and maintain infrastructures. SPVs can  
4 have staff and capital to undertake industrial activities.

5 **OF2-Managing activities:** Sponsors of SPVs can appoint managers to run the company.  
6 Often, SPVs are used only as a legal box or “envelope” without performing any real activities;  
7 therefore, managers are not required.

8 **OF3-Administering contracts:** SPVs can employ staff to administer their contracts. Often,  
9 SPVs acts as clients monitoring the performance of their external contractors and suppliers.

10 **OF4-Governing:** A critical function provided by SPVs is governance. The typical structure is  
11 based on the nature of the decision-making process characterising corporations. Unlike  
12 corporations, the governance of SPVs is dedicated exclusively predefined purposes, formally  
13 defined in the shareholder agreement, article of incorporation, or similar contractual  
14 arrangements underlying SPVs.

15

#### 16 4.1.4 Sample of quotes from experts

17 Table 2 provides a sample of meaningful quotes from interviewees associated with functions  
18 of SPVs, as well as the empirical evidence supporting each function.

<b>Functions of SPV</b>	<b>Empirical Evidence</b>	<b>Examples of quotes from interviewees</b>
<b>LF1-Contracting</b>	<i>Supported by 24 interviewees</i>	<i>SPVs are incorporated companies characterised by a legal personality. [...] Like companies, SPVs can hire people, establish contracts, own assets and borrow money.</i>
<b>LF2-Collecting &amp; hiring</b>	<i>Supported by 16 interviewees</i>	
<b>LF3-Co-owning and investing</b>	<i>Supported by 19 interviewees</i>	<i>When the opportunity arises, companies that develop motorways and fund the provision of motorways will come together, in one form or another, because they are interested in tendering. Typically, the ownership of the SPV will be an EPC, typically, not in all cases, and Operator, and institutional investors, which are not interested in senior debt but in equity.</i>
<b>LF4-Transferring</b>	<i>Supported by 13 interviewees</i>	<i>In the BOT approach, the SPV enables to transfer the assets to the public agency at the end of the concession period.</i>
<b>LF5-Constraining</b>	<i>Supported by 11 interviewees</i>	<i>This loan arrangement here, will have a significant number of provisions in it, which entitle the banks to direct the company to do things. And they are like to say, you must terminate that EPC contract and appoint another EPC contractor.</i>
<b>LF6-Isolating</b>	<i>Supported by 10 interviewees</i>	<i>But I would say we're, you know, from a conflict of interest's perspective, we're...we're all almost like two separate entities: you know, we don't share offices, we don't really share any numbers or anything, like we're operating under different systems.</i>
<b>LF7-Targeting jurisdictions</b>	<i>Supported by 12 interviewees</i>	<i>Much more relevant are the tax aspects, therefore, the countries. Also, requirements of lenders about the securities of the SPVs. Ability to enforce security for practical and legal reasons.</i>
<b>CF1-Channelling risk and responsibilities</b>	<i>Supported by 22 interviewees</i>	<i>Contractual responsibility for the project is single. The SPE discharges its responsibility to the contractor and the operator.</i>
<b>CF2-Channelling assets and funds</b>	<i>Supported by 18 interviewees</i>	<i>The SPV is the single, central, borrower for the project. The funds collected are used to build the project and pay the suppliers. The SPV is also used to secure the revenue stream, usually with a concession, or an off-take contract, or similar instruments. During the commercial phase, the secured revenue covers the infrastructure OPEX, and service the debt, and ultimately repay the investors.</i>
<b>CF3-Transforming risks</b>	<i>Supported by 17 interviewees</i>	<i>The performance risk is discharged through here because the borrowers aren't taking the risk. By doing so the insolvency risk is mitigated.</i>
<b>CF4-Clustering and institutionalising multiple stakeholders</b>	<i>Supported by 21 interviewees</i>	<i>Typical scheme is the financial SPE plus an existing EPC contractor and an existing Operator. The SPE serves centre a single point of responsibility for all the parties involved.</i>
<b>OF1-Performing activities</b>	<i>Supported by 13 interviewees</i>	<i>The construction SPV manage and built the infrastructure project.</i>
<b>OF2-Managing activities</b>	<i>Supported by 11 interviewees</i>	
<b>OF3-Administrating contracts</b>	<i>Supported by 10 interviewees</i>	<i>this is a function of how much the SPE performs itself and how much it administers</i>
<b>OF4-Governing</b>	<i>Supported by 21 interviewees</i>	<i>An SPV can mean and include various corporate, partnership or other bodies as defined by law. The precise choice may be a trade-off of functionality, tax, security, liquidity and governance and may have cross border implications</i>

Table 2: Functions of SPVs

## 4.2 Types of SPVs involved in infrastructure megaprojects

There are four main types of SPVs: Project Companies (PCs), Industrial Vehicles (IVs), intermediate SPVs, and Jurisdictional Shell Companies (JSCs). Often, megaprojects involve all these types of SPVs concurrently. The following subsections present each type of SPV and describe its functions. For each type of SPV, Section 4.2.5 highlights a sample of direct quotes from the interviewees. Table 3 summarises the functions associated with each type of SPV, distinguishing whether the functions are critical for the type of SPV (Table 3.C), or whether they are accessories. Some accessory functions are provided either sometimes (Table 3.S), or rarely (Table 3.N). Table 3 has been developed using the axial coding described in Section 3.2.

		Project Companies	Industrial Vehicles	Intermediate SPVs	Jurisdictional Shell Companies
Legal Functions (LF)	LF1-Contracting	C	C	C	S
	LF2-Collecting & hiring	C	C	C	S
	LF3-Co-owning and investing	C	S	S	S
	LF4-Transferring	S	S	C	S
	LF5-Constraining	C	C	N	S
	LF6-Isolating	C	C	C	S
	LF7-Targeting jurisdictions	S	S	S	C
Project Contracting Functions (CF)	CF1-Channelling risk and responsibilities	C	C	C	S
	CF2-Channelling assets and funds	C	S	C	S
	CF3-Transforming risks	C	S	C	S
	CF4-Clustering and institutionalising multiple stakeholders	C	C	N	S
Organisational Functions (OF)	OF1-Performing activities	N	C	N	S
	OF2-Managing activities	S	C	N	S
	OF3-Administrating contracts	C	C	N	S
	OF4-Governing	C	S	N	S

Table 3: Functions of different types of SPV in infrastructure megaprojects. Legend: C=critical function, S=functions available sometimes, N=negligible function for the SPV



1 Table 3 can be used either to identify the alternative types of SPVs knowing its functions, or  
2 to design the functions of specific types of SPVs. Therefore, it contributes directly to clarify  
3 the uses of alternative types of SPVs in infrastructure megaprojects. The following sub-  
4 sections describe more in detail the four alternative types of SPVs.

5

#### 6 4.2.1 Project Companies

7 PCs are SPVs primarily used to collect and structure the finances for megaprojects. Experts  
8 often use the term PC to indicate the central and more critical SPV involved in the PF  
9 transactions.

10 The most relevant LFs provided by PCs are LF1-Contracting, LF2-Collecting & hiring,  
11 LF3Co-owning and investing, LF5-Constraining, and LF6-Isolating. PCs are at the centre of  
12 the contracting network. PCs establish contracts (LF1 Contracting) with sponsors, lenders,  
13 government agencies, the infrastructure operator etc. PCs act as borrowers on behalf of  
14 lenders and clients for contractors and suppliers.

15 Usually, PCs hire directors mainly focused on the financial and contractual administration of  
16 the project. PCs can own considerable assets, including the delivering infrastructure (LF2-  
17 Collecting & hiring). The owners are determined by the financial structure of PCs (together  
18 with further contractual provisions), allowing stakeholders to invest or lend capital to the PC  
19 (LF3Co-owning and investing). The stakeholders investing in the PC are project sponsors,  
20 banks, government and government agencies, and institutional investors. The governance of  
21 PCs is constrained by enforceable and formal decision-making processes (LF5-Constraining),  
22 providing check and balances for investors and lenders. The formal governance of PCs  
23 depends on the corporate structure and the contractual provisions. Often lenders retain  
24 significant controlling power over the management of PCs until the loan has been either  
25 repaid or refinanced. Usually, PCs are used as an off-balance-sheet vehicle, meaning that their

1 assets and financial liabilities are isolated (in legal and accounting terms) from their  
2 originators, investors and lenders (LF6-Isolating).

3 Sometimes, PCs provide the accessory LFs: LF4-Transferring, and LF7-Targeting  
4 jurisdictions. The ability to transfer a pool of assets and liabilities among various stakeholders  
5 can be essential for some specific transactions (LF4-Transferring). For example, in Build  
6 Own Transfer (BOT) concession schemes, the infrastructure is usually transferred to the  
7 original concession grantor after a predefined period. PCs can be incorporated in jurisdictions  
8 having long traditions and experience in PF and banking law (LF7-Targeting jurisdictions),  
9 for enforcing reasons. The protection of the security interest for lenders is another critical  
10 aspect determining the selection of the jurisdiction. Sometimes, the legal and regulatory  
11 framework prescribes that the PC must be incorporated in the country where the infrastructure  
12 is developed.

13 All CFs are relevant for PCs. PCs are used as hubs in the contracting network to transfer risk  
14 and responsibilities to the stakeholders that are better able to manage them (CF1-Channelling  
15 risk and responsibilities). PCs are used as the financing vehicle for the megaproject (CF2-  
16 Channelling assets and funds).

17 PCs transform the risks associated with their investors, including contracts, hedging  
18 instruments, as well as a layered financial structure (CF3-Transforming risks). Finally, PCs  
19 institutionalise the voice of the investors and other stakeholders, through a coherent corporate  
20 governance structure (CF4-Clustering and institutionalising multiple stakeholders).

21 Concerning the OFs, PCs have limited involvement in OF1-performing activities, such as the  
22 construction or operation of infrastructure. In PF, PCs borrow substantial capital, usually  
23 syndicated loans. The financial structure of PCs is unbalanced with vast debt, partly  
24 guaranteed by contracts securing the revenue stream. Consistently, lenders require de-risking  
25 the PCs, excluding a direct involvement in both construction and operations. Similarly, PCs

1 have a limited role in OF2-Managing activities but play a central role in OF4-governing the  
2 projects, and OF3-administrating contracts with external suppliers, contractors and operators.  
3 PCs steer the megaproject on behalf of their investors. PCs are placed at the centre of the  
4 contracting network so that they administrate critical contracts for contracting network,  
5 including construction contrast (PCs are clients), operation & maintenance contract (PCs are  
6 clients), supply contracts for critical inputs of infrastructure (PCs are clients), public  
7 concessions (PCs are the concessionaires), off-take contracts (PCs are the service providers),  
8 loan agreements (PCs are borrowers) etc.

9

#### 10 4.2.2 Industrial Vehicles

11 IVs are involved in physical and industrial undertakings, including designing and operating  
12 infrastructure megaprojects. They are comparable to consortia, but with legal personality.  
13 Usually, the IVs are incorporated joint ventures bringing together stakeholders with  
14 complementary capabilities, e.g. contractor and technology provider. Consistently, IVs hire  
15 personnel, buy and lease equipment (LF2-collecting & hiring).

16 Among the most relevant LFs for IVs, there are LF1-Contracting and LF5-Constraining  
17 allowing IVs to assume contractual responsibilities. IVs can be used for their LF6-Isolating  
18 function. In some national contexts (e.g. Islamic jurisdictions), the legal framework requires  
19 international contractors to employ local corporations (i.e. IVs) to undertake  
20 physical/industrial activities. Local corporations are subjected to domestic law (LF7-  
21 Targeting jurisdictions). Sometimes, IVs can also be used to LF3Co-owning and investing  
22 and LF4-Transferring; however, these are not the critical functions for IVs.

23 The most critical CFs for IVs are CF1-Channelling risk and responsibilities, and CF4-  
24 Clustering and institutionalising multiple stakeholders. Firstly, IVs cluster multiple  
25 contractors redistributing collective risks and responsibilities. Secondly, IVs provide a single

1 point of responsibility for a cluster of activities, building, operating infrastructure  
2 megaprojects. Sometimes, IVs can be used either for CF2-Channelling assets and funds or  
3 CF3-Transforming risks; however, these are not essential functions for IVs.

4 IVs have significant OFs, in particular, OF1-Performing activities, OF2-Managing activities  
5 and OF3-Administrating contracts. IVs either build or operate the infrastructure megaprojects.

6 IVs' sponsors appoint operative directors to manage their activities and administer contracts  
7 with external contractors and suppliers. Often, in IVs, prevail the function of OF2-managing  
8 activities, rather than OF4-governing infrastructure megaprojects.

### 9 4.2.3 Intermediate SPVs

10 Intermediate SPVs are used as legal instruments to create complex ownership, accounting and  
11 contracting structures. Intermediate SPVs are often justified for tax, accounting, and risk-  
12 related purposes. Intermediate SPVs can be used to isolate specific assets and liabilities from  
13 their originators. In private equity transactions, intermediate SPVs are widely employed.  
14 These techniques were transferred to the PF domain and used in megaprojects.

15 The most critical LFs for intermediate SPVs are LF1-Contracting, LF2-Collecting and hiring,  
16 LF4-Transferring, and LF6-Isolating. Thanks to their contractual capacity, intermediate SPVs  
17 interpose and connect different contracting parties to realise their intended purposes.  
18 Intermediate SPVs are used for LF4-Transferring of a compound of assets, in particular,  
19 financial assets and liabilities. LF6-Isolating is the essential function provided by intermediate  
20 SPVs.

21 Intermediate SPVs can cluster multiple owners or investors (LF3-Co-owning and investing);  
22 however, this function is not critical. Sometimes, intermediate SPVs have a single owner, and  
23 their purpose can be implicit. LF7-Targeting jurisdictions can be a relevant function,  
24 particularly for tax optimisation purposes. LF5-Constraining is not a relevant function for  
25 Intermediate SPVs.

1 Intermediate SPVs, can play an important role in the financing and contracting of  
2 infrastructure megaprojects. Therefore, intermediate SPVs can provide CF1-Channelling risk  
3 and responsibilities, CF2-Channelling assets and funds, CF3-Transforming risks. Rarely  
4 Intermediate SPVs enable to CF4-Clustering and institutionalising multiple stakeholders.  
5 Finally, intermediate SPVs do not require management and are used exclusively as a legal  
6 device.

7

#### 8 4.2.4 Jurisdictional Shell Companies

9 Jurisdictional Shell Companies (JSCs) are SPV's incorporated to target specific jurisdictions  
10 for legal or tax-related aspects. Sometimes, JSCs are incorporated offshore to take advantage  
11 of lower taxes, protection of the security interest of investors (in particular lenders), and  
12 favourable conditions concerning information disclosure. Sometimes, JSCs are incorporated  
13 onshore, in the country where the infrastructure megaproject is being developed; for example,  
14 because domestic law requires public service providers (e.g. infrastructure operator) to be  
15 incorporated locally. The primary function provided by JSCs is LF7-Targeting jurisdictions.  
16 All other functions (i.e. legal and organisational) are secondary, and they can be exploited  
17 depending on the specific transactions involving JSCs. Therefore, JSCs do not play a  
18 significant role in the governance of projects.

1 4.2.5 Sample of quotes from experts

2 Table 4 shows a sample of quotes from the experts describing the types of SPVs that have  
 3 been introduced in the previous sections.

4

Type of SPV	Direct Quotes
Project Companies	<p><i>"Typical scheme is the financial SPE plus an existing EPC contractor and an existing Operator. The SPE serves as a single point of responsibility for all the parties."</i> I03-E03</p> <p><i>You have a single SPV that carries out the project. Separate finance SPV and then leads to the project company, construction SPV, JV consortium.</i> I15-E14</p> <p><i>"We had SPV-xxxx which the seat shareholder that was the umbrella company, also responsible for the overall financing for the authority engineering."</i>I16-E15</p> <p><i>"The purpose is usually to keep the cash flow and the guarantees of the parent companies off balance sheet."</i> I11-E10</p>
Industrial Vehicles	<p><i>"Sometimes the EPC is a Joint Venture, a major construction joint venture. Sometimes are unincorporated. Sometimes incorporated. Often they are incorporated as SPV"</i> I03-E03</p> <p><i>"Sometimes, the SPV is incorporated to build the infrastructure. Typically, it assumes the role of the main contractor for the megaproject."</i> I11-E10</p> <p><i>"The operations function is the coordination and effectiveness of resources and managing the interfaces with those matters that are self-performed and those matters which are sub-contracted."</i> I02-E02</p> <p><i>"In terms of operational obligations, and to the extent these are not back to back with sub-contractors, the lenders will seek to have third-party expert advice to ensure that, depending on the complexity of the operations, the right resources and experience is made available to or is within the OpsCo consistent with their residual obligations."</i> I02-E02</p> <p><i>"sometimes we self-perform the operation (within the SPV) [...] SPV, so we would, you know, set up an operation with maybe 100-150 people employed [...] if you have 7 employees or 120, obviously you need, you know, a heavier governance structure, being in the biggest company."</i> I06-E05</p> <p><i>Some SPVs perform industrial activities such as the construction or the operation of the infrastructure.</i> I15-E14</p> <p><i>"A fully resourced substantially self-performing SPE will have budgeted to attract marketing and technical staff and will have to have made, and will continue to make, operational decisions relating to service delivery, resourcing, systems and supporting stakeholder engagement. A fully functioning SPE, therefore, has to have the right level of quality of people and leadership."</i> I02-E02</p>
Intermediate SPVs	<p><i>Other SPVs intermediate and interpose other contracting agents including other SPVs. [...] like in mergers and acquisitions, some SPVs are used to optimise specific transactions such as the purchase of the target company. In project financing, some "intermediating SPVs" can be used to separate the sponsors from the proper SPV used to finance. These "intermediating SPVs" enhance the application of the bankruptcy remoteness principle for the main SPV. Besides, they can be used in certain jurisdictions to realise off-balance sheet vehicles.</i> I15-E14</p> <p><i>"The SPE is not limited to one vehicle but describes the totality of the project vehicles that relate to the support of financing of the project. The securities in such multi-vehicle may be "stapled together" to create a proportionate ownership interest in the overall project, or not."</i> I02-E02</p>
Jurisdictional Shell Companies	<p><i>Some SPEs are incorporated purely for jurisdictional and reasons. Sometimes this is required by the Law. In the Islamic countries, you are required to incorporate the SPV in the country where you develop the infrastructure.</i> I24-E22</p> <p><i>People designing are not necessarily driven by the infrastructure, much more relevant are the tax aspects; therefore the jurisdiction considered. Also requirements of lenders about the Securities of the SPVs. Ability to enforce security, for practical and legal reasons.</i> I15-E14</p> <p><i>"In other markets, I saw SPVs for entering new markets for new sales. Penetrate new market."</i> I08-E7</p>

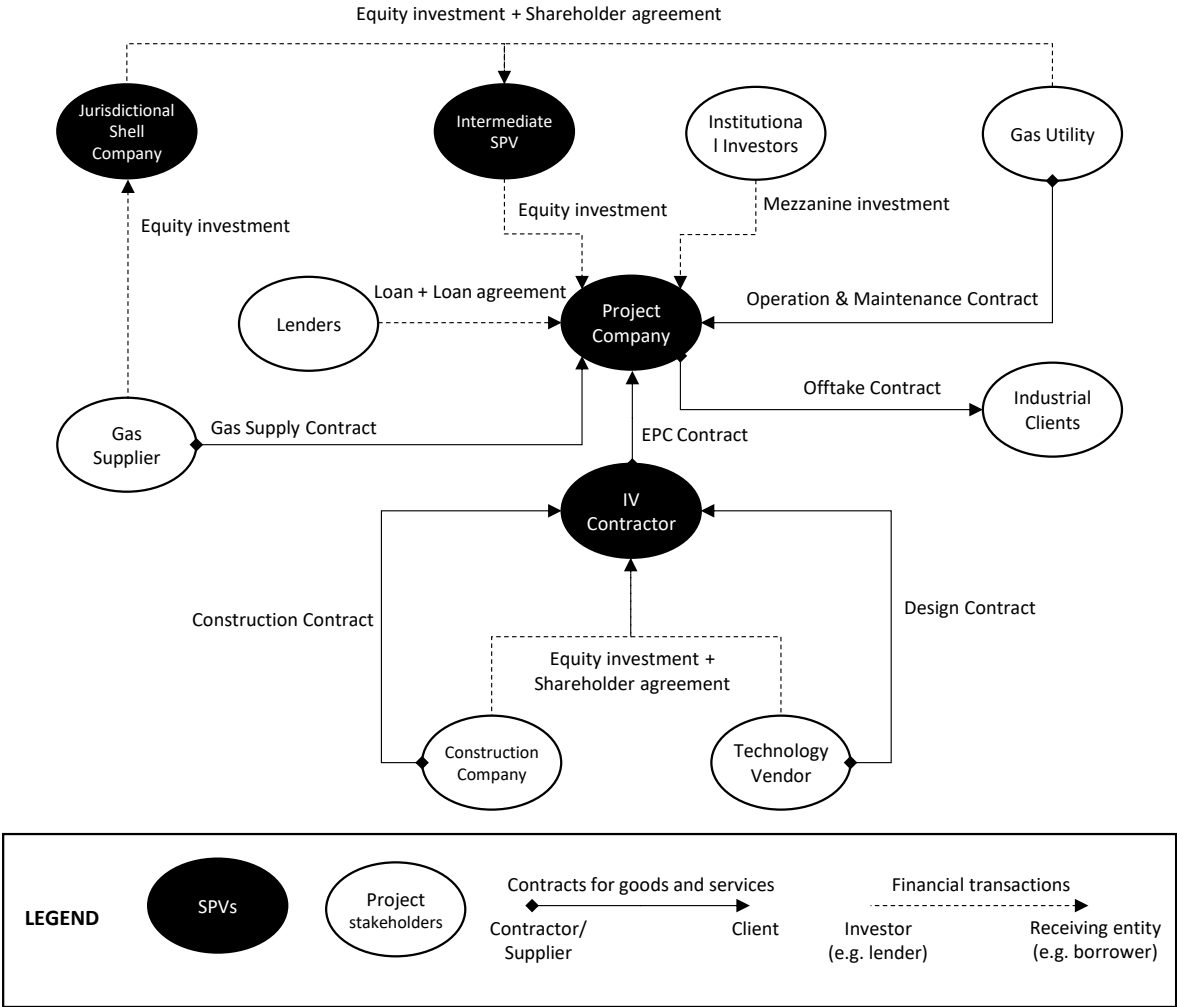
5

Table 4: Sample of quotes from experts

1 **5 Example of infrastructure megaprojects involving SPVs**

2 This section introduces a fictional example to compare alternative types of SPVs. There is a  
 3 wide range of infrastructure megaprojects that involve SPVs in a way that is comparable to  
 4 the example presented in this section, including Hinkley Point C (Ansar and Flyvbjerg, 2016;  
 5 Černoch and Zapletalová, 2015), Rovigo LNG project (Arteconi and Polonara, 2013), and  
 6 Andosol Power Plant (Brookes et al., 2017). This example is inspired by real cases, whose  
 7 data is confidential. The example consists of a LNG-plant. Figure 2 introduces a simplified  
 8 contracting and financing scheme based on a PF approach.

9



10

11 *Figure 2: Contracting & financing scheme for the functional LNG projects*

12

1 The project sponsors are a gas supplier and a gas utility. The PC is set up to collecting and  
2 ring-fencing the finance, securing the revenues stream, and bundling the ownership rights  
3 associated with the LNG infrastructure. The corporate structure enables the PC to collect the  
4 debt (from lenders), equity (indirectly from sponsors) and mezzanine from institutional  
5 investors. The PC establishes several contractual transactions:

- 6 • securing the revenue stream with a long-term offtake contract with industrial clients;
- 7 • entering into an EPC contract with the IV – contractor, which is another type of SPV  
8 involved in the project;
- 9 • securing the supply of gas with a supply contract;
- 10 • entering into an operation and maintenance contract with the gas utility.

11 These transactions allow the PC to transfer the main risks and responsibilities to third parties.  
12 The PC is an investment vehicle and critical contracting party: it is the project client (i.e.  
13 supply contract, EPC contract, Operation and Maintenance contracts), and the gas supplier for  
14 the ultimate customer (i.e. Industrial clients, off-takers). The PC plays a relevant for the  
15 project governance because at the centre of the contractual and financial nexus.

16 The key sponsors of the project don't invest directly into the PC but use an intermediate SPV  
17 to separate themselves from the PC. The intermediate SPV reinforces the bankruptcy  
18 remoteness principle so that if either the gas supplier or the gas utility was bankrupt, the  
19 assets associated with the PC cannot be considered in their liquidation process. The  
20 intermediate SPV isolates the PC from the risk of bankruptcy of the sponsors. This investment  
21 structure reassures the lenders to the PC, that can focus exclusively on the project risks  
22 associated with the PC and don't need to assess the creditworthiness of the sponsors. The  
23 intermediate SPV is a limited liability company, as it is the PC. This structure enables the  
24 sponsors to isolate the investment risk; the maximum loss is the equity stake, and revenues  
25 since both sponsors are also contractors to the PC. This contractual structure can be effective



1 for financial risks and additional legal liabilities associated with the investment. Still, it  
2 cannot reduce the reputational risk, which is also very important in these types of transactions,  
3 particularly in the eyes of lenders that are exposed with limited or no collateral.

4 The intermediate SPV aligns the interests of the two sponsors. It has no staff, being merely a  
5 legal device used for legal aspects associated with bankruptcy law and corporate law. While  
6 the knowledge of the PC is public, the intermediate SPV is confidential along with the  
7 shareholder agreement between the two sponsors; the other first-tier contractors are aware of  
8 this confidential information, particularly the lenders.

9 The gas supplier does not invest directly into the intermediate SPV, but rather use offshore  
10 jurisdictional shell companies for tax advantages. As a result, the gas supplier is de-facto the  
11 investors into the PC and can appoint directors within it. Form the accounting and tax  
12 perspective, the gas utility is remote to the PC. The jurisdictional shell company is a piece of  
13 confidential information, the gas utility is aware of it, but this information is not public.

14 The last type of SPV in this project is the IV- contractor. This is an incorporated joint venture  
15 between a construction company and a technology provider. The IV bundle the  
16 responsibilities for both the EPC of the LNG plant. The IV is equipped with dedicated staff.  
17 From the perspective of the PC, the IV represents the single point of responsibility for the  
18 EPC of the LNG. However, some the physical activities are transferred from the IV to its  
19 sponsors via the construction contract, and the design contract. The IV provides the  
20 governance mechanisms to align the interests of both sponsors whose revenue streams depend  
21 on the EPC contract between the IV and the PC. If either the design or construction is flawed,  
22 the EPC contract can default, and both companies are liable, suffering the loss. This  
23 arrangement also facilitates eventual litigations between the PC, the construction company  
24 and the technology vendor, because it enables to create an artificial main contractor, the IV.

1 This example presents the four different types of SPVs and summarises their main function  
2 for the LNG project, which are very different from each other. This example highlights that  
3 SPVs enable to structure complex and sophisticated transactions in infrastructure  
4 megaprojects.

## 1 **5 Discussion and Conclusion**

2 In project studies, the terms SPV is used to generalise about different types of organisations,  
3 ranging from large utilities operating infrastructures, incorporated construction consortiums,  
4 to organisations which exist only formally, but neither have staff nor undertake any physical  
5 activity. Regrettably, SPV is a generic term describing organisations that are radically  
6 different and perform very different roles in projects.

7 The first contribution of this paper is explaining the different types of SPVs, differentiating  
8 industrial organisations equipped with staffs and undertaking physical activities (i.e. Industrial  
9 Vehicles) from almost intangible organisations that are merely legal devices with no (or few)  
10 staff, and which are used only for layering the ownership structure (i.e. Intermediate SPVs) or  
11 targeting specific jurisdictions for tax or legal purposes (i.e. JSCs).

12 The paper introduces a classification to explains what functions alternative types of SPV, in  
13 particular, Table 3 (Section 4.2.) allows recognising the types of SPVs from their function.

14 The classification considers four main types of SPV: Project Companies (PCs), Industrial  
15 Vehicles (IVs), Intermediate SPVs, and Jurisdictional Shell Companies (JSCs). Each type of  
16 SPV combines specific functions to their associated transactions, which can be clustered  
17 according to three main perspectives (1) legal (Section 4.1.1), (2) project contracting (Section  
18 4.1.2), and (3) organisational (Section 4.1.3).

19 This classification is a relevant contribution to practice because it enables non-legal experts to  
20 understand the use of alternative SPVs in complex transactions. A better understanding of the  
21 functions of alternative SPVs is essential for designing, negotiating and performing the  
22 governance of infrastructure megaprojects, which is critical for their performance. This paper  
23 explains in detail the functions provided by SPVs, to enable project management practitioners  
24 to understand what SPVs do for infrastructure megaprojects and the implications for project  
25 governance. For instance, project managers might be involved in the negotiation and

1 management of SPVs without legal or financial expertise. The complicated transactions  
2 characterising infrastructure megaprojects are deemed to be highly technical and not entirely  
3 understandable by non-experts of structured finance. This paper provides a simplified  
4 perspective for project management practitioners to understand how SPVs influence project  
5 transactions.

6 The classification can also be used retrospectively on the existing literature, to highlight the  
7 inherent ambiguity of the term SPV. Some project studies considered SPVs as incorporated  
8 vehicles used for financing and owning infrastructures, i.e. PCs (Brookes et al., 2017;  
9 Chowdhury et al., 2015; Lee and Yu, 2011; Li et al., 2017; Sobhiyah et al., 2009; Wang et al.,  
10 2019, 2018; Zou et al., 2014). Other authors describe SPVs as an organisation assuming  
11 contractual responsibilities for either the construction or operation of projects, i.e. IVs (van  
12 den Hurk and Verhoest, 2015). Sometimes, the term SPV is very indirect and general, and it is  
13 not clear what SPVs do for projects, and therefore it is not possible to understand what types  
14 of SPV and what are their function for projects (Ke et al., 2010; T. Liu et al., 2016; Liu and  
15 Wilkinson, 2014; Smyth and Edkins, 2007; Wang and Liu, 2015, 2015; Wu et al., 2016).  
16 Following this paper, project scholars might become more rigorous and accurate when dealing  
17 with SPV.

18 The paper also highlights the most relevant types of SPVs for project studies, namely PCs and  
19 IVs. PCs play a central role dealing with the ownership rights, governing the infrastructure  
20 funds and the most critical contractual transactions for the infrastructure; all these aspects are  
21 directly connected to project governance. IVs are directly involved in building and operating  
22 infrastructure megaprojects, therefore are relevant for project studies. Conversely,  
23 intermediate SPVs and JSCs are almost irrelevant for project management (and governance)  
24 as they justified for technical legal purposes that are often indirect and remote to the topics  
25 considered in project studies.

1 The second contribution concerns the functions provided by alternative types of SPVs. This  
2 functional perspective is relevant to understand the transactions associated with the SPVs in  
3 infrastructure megaprojects. This approach is consistent with the TCT that assumes alternative  
4 functions for formal instruments such as contracts and corporate organisations (Coase, 1937;  
5 Williamson, 1981). This paper explains the functions provided by SPVs facilitating a better  
6 understanding of TCT in sophisticated tractions, characterising some infrastructure  
7 megaprojects. In particular, the paper explains the hybrid nature of SPVs, combining  
8 functions of contracts and corporations.

9 SPVs are incorporated vehicles (i.e. corporate organisations) equipped with formal  
10 instruments limiting their flexibility and predefining their functions. SPVs are usually  
11 liquidated when their functions have been accomplished; therefore, their lifetime is limited,  
12 similarly to contracts. Typical formal instruments used to limit their flexibility includes the  
13 article of incorporation, shareholder agreement, and the internal policies (i.e. company  
14 bylaw). As a result, SPVs are very different from corporations as originally assumed in TCT  
15 (Williamson, 1981, 1979).

16 SPVs are meaningless if considered only as independent corporate organisations. The  
17 Functions of SPVs can be investigated using three main perspectives: (1) legal (Section  
18 4.1.1), (2) project contracting (Section 4.1.2), and (3) organisational (Section 4.1.3). These  
19 three perspectives emerged inductively and describe the hybrid nature of SPVs.

20 Similarly to contracts, SPVs introduce enforceable provisions to both shareholders and  
21 contracting parties to reduce uncertainty concerning aspects such as proprietary rights.  
22 Furthermore, SPVs provides effective instruments to align the objectives of both stakeholders  
23 and the project. For instance, investors and creditors to PCs benefit when the project is built  
24 and operated efficiently part of the revenues for contactors is determined by the equity  
25 dividends that are distributed by PCs. Therefore, it is common that project sponsors and

1 relevant prime contractors have an equity stake on PCs. SPVs provide the instrument to co-  
2 invest in infrastructure, a function that contracts cannot afford. Differently than contracts,  
3 SPVS provides more sophisticated governance structure, enabling to amend project decisions  
4 and re-negotiate consistently with pre-established governance processes embedded in SPVs.  
5 With this respect, SPVs offer complex solutions to open contracting (Hart, 1988).

6 SPVs provides functions similarly to corporations, including legal personality and the ability  
7 to undertake contractual obligations and to organise “internally” industrial activities.  
8 Contracts cannot provide these functions to transactions. Differently than corporate  
9 organisations, SPVs have pre-defined and limited functions for transactions and cannot decide  
10 freely, but are instead constrained in their governance, and governed by critical projects  
11 stakeholders such as their investors.

12 Finally, this paper paves the way to further researches on SPVs in projects. Relevant research  
13 questions include:

- 14 • What is the transaction cost of negotiating and incorporating SPVs?
- 15 • How do SPVs influence the governance of infrastructure megaprojects?
- 16 • What are the differences between SPVs involved in infrastructure megaprojects, and the  
17 ones involved in smaller projects?
- 18 • What agencies apply in SPVs? This research question refers directly to the agency theory  
19 that can provide an alternative governance perspective on SPVs (Jensen and Meckling  
20 1976; Joslin and Müller 2016; Eisenhardt 1989; Ahola et al. 2014; Fama and Jensen 1983;  
21 Schleifer and Vishny 1997)What conflict of interest (if any) occurs in SPVs in project  
22 context?
- 23 • What remedies do limit conflict of interest in SPVs?

24

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