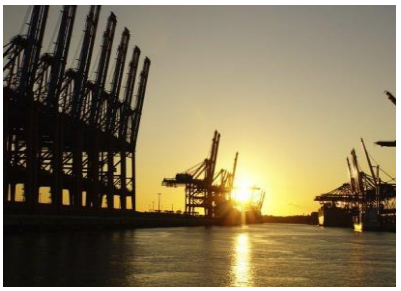
GOVERNMENT SUPPORT FOR ENHANCING PUBLIC PRIVATE PARTNERSHIPs (PPPs):

COMPARING, EXPLAINING AND STUDYING THE EFFECTS OF VARIATIONS ACROSS EUROPEAN COUNTRIES



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Government Support for Enhancing Public Private Partnerships (PPPs): Comparing, Explaining and Studying the Effects of Variations Across European Countries

Thesis for the degree of Doctor in Social Sciences: Political Science

at the University of Antwerp to be defended by

Raden Murwantara

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Antwerp, 2023

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Raden Murwantara

Antwerp, March 2023

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Abbreviations

PFI	:	Private Finance Initiative
COST	:	Cooperation in Science and Technology
EIB	:	European Investment Bank
EBRD	:	European Bank and Rehabilitation and Developments
EPEC	:	European PPP Expertise Centre
OECD	:	Organisation for Economic Cooperation and Development
UNESCAP	:	United Nation Economic and Social Commission for Asia and the Pacific
PPIAF	:	Public-Private Infrastructure Advisory Facility
SPSS	:	Statistical Package for Social Sciences
CA	:	Cluster Analysis
NPM	:	New Public Management
PPP-GSI	:	Public Private Partnership Governmental Support Index
BENEFIT	:	Business Models for Enhancing Funding and Enabling Financing for Infrastructure in Transport
GCI	:	Global Competitiveness Index
CSF	:	Critical Success Factor
GDP	:	Gross Domestic Product
NAO	:	National Audit Office
QCA	:	Qualitative Comparative Analysis
fs-QCA	:	fuzzy-set Qualitative Comparative Analysis Method
IMF	:	International Monetary Fund
FIMA	:	Financial Information Management
UNCITRAL	:	United Nation Commission on International Trade Law
DBFO	:	Design, Build, Finance and Operate
DBFM	:	Design, Build, Finance and Maintenance
ESS	:	Error sum of squares
EC	:	European Commission
IM PPP	:	Inter-Ministerial Committee for Public and Private Partnerships
PDI	:	Power Distance Index
IDV	:	Individualism
MAS	:	Masculinity
UAI	:	Uncertainty Avoidance Index
LTO	:	Long term Orientation
AWG1	:	Auxillary Working Group 1
FEM	:	Foreign exchange market
EU	:	European Union
EEA	:	Eastern European Countries
IBRD	:	International Bank for Reconstruction and Development
AT	:	Austria
BE	:	Belgium
FR	:	France
NL	:	Netherlands
CH	:	Switzerland
DE	:	Germany
CY	:	Cyprus
GR	:	Greece
IT	:	Italy
PT	:	Portugal
RS	:	Serbia
SI	:	Slovenia

DK	:	Denmark
EE	:	Estonia
FL	:	Finland
SE	:	Sweden
UK	:	United Kingdom
CZ	:	Czech Republic
SL	:	Slovakia
HU	:	Hungary

Chapter 1

Introduction

1.1.Background and Focus

1.1.1. Public Private Partnerships (PPPs) and motivations of adopting PPPs

The history of PPPs dates from the late of 1980s with the implementation of PFI in The United Kingdom (van de Hurk & Liyanage 2013) and it became a more well-known phenomenon when spreading to other countries in Continental Europe (Savas 2000; Yescombe 2007). However, when tracing back the involvement of the private sector to the provision of public infrastructures, France first introduced the concession-type for construction of a large majority of interurban motorways in the 1950s (Bonnet & Chomat 2013).

PPPs is an agreement between the government and one or more private partners (which may include the operators and the financiers) according to which the private partners deliver the service in such a way that the service delivery objectives of the government are aligned with the profit objectives of the private partners. The effectiveness of the alignment depends on a sufficient transfer of risk to the private partners (OECD 2008). Furthermore, Van Ham and Koppenjan (2001) define PPP as a co-operation of some durability between public and private actors in which they jointly develop products and services and share risks, costs and resources connected with these products. Thus, PPPs can be understood with reference to at least three main concepts: (1) an agreement between public and private sectors through a long-term contract, (2) the development of services with an alignment between the motives for the public sector (i.e the service delivery for the government) and the profit motive of the private partners, and (3) the sharing of risk, costs and resources.

Governments have different motivations for adopting PPPs. Boardman and Vining (2010) point out two main groups of motivations: normative motives (i.e technical efficiency, economies of scope/bundling activities) and positive motives (i.e postponing cost, decrease government debt, off-balance sheet financing, increase of net cash flow, risk transfer, diminishing political risk). For example, PPP is considered more efficient than the public procurement (Grimsey & Lewis 2005; Hodge & Greve 2010). PPP can also enable the government to deliver the project on time, within budget and on specification (Grimsey & Lewis 2004). However, the success of PPP projects is not a given; very often projects fail to yield the promised benefits (Croce & Gatti 2014). The governance of PPP projects is crucial, and hence the way governments support public and private actors in PPP projects is critical.

1.1.2 The importance of governmental support for PPPs

The role of government is vital to enhance PPPs, more specifically the way and the extent in which the government provides support for the development of PPPs. As some empirical studies pointed out, the success of PPPs is affected by the support provided by government in terms of a PPP-stimulating legal framework, the upkeeping of PPP-related process transparency and standardization of procedures (Azis 2007), judicious government control (Chan et.al. 2009), political support, expert advice and review (Jacobson & Choi 2008), as well as a strong structure at the level of central government to steer and guide policy implementation with the active involvement of PPP knowledge unit (Jamali 2004).

Other empirical studies also emphasize the importance of the role of governmental support for PPPs. First, Osei-Kyei & Chan (2015) summarizes critical success factors for PPP projects based

on a review of 27 journal articles published between 1990 and 2013 and find that different aspects of governmental support are vital aspects to enhance PPP. Such support refers to: political support (9/27); public support (8/27); favourable legal framework (7/27); and political stability (3/27). Second, Zagozdzon (2013) studied the determinants of implementation of PPPs in Poland and listed the PPP legal system and capacity of public institutions as important determinants.

Several international organizations as well as public consultants also reinforce the importance of governmental support for PPPs. They provide a measure to show the level of the contextual fit for PPPs using different labels, for example: 'PPP-readiness' (UNESCAP, 2005; Economist Intelligence Unit (EIU), 2011), 'PPP maturity level' (Deloitte, 2007) and 'quality of PPP legislation' (EIB, 2011; EBRD, 2012). The UNESCAP (2005) measures 'PPP readiness" including broad elements including general investment climates and legal and regulatory environment. Its scoring model uses ordinal scoring between 0 (poor) and 4 (very good). Similiarly, the EIU (2011) takes into account weighted indicators referring to the legal and regulatory framework (25%); institutional framework (20%); operational maturity (15%); investment climates (15%); financial facilities (15%) and adjustment factor (10%). This score is then linked to four classifications: nascent, emerging, developed, and mature PPP-readiness. Furthermore, the notion of 'PPP maturity' developed by Deloitte (2007) denotes the level of adoption of PPPs from stage 1 (the lowest) to level 3 (the highest). Finally, the EIB (2011) focuses only on 'the quality of legislation' and scores the level of compliance between < 30% to > 90%.

The remaining sections discuss the importance of studying the role of government for enhancing PPPs which is further in this dissertation referred to as 'governmental PPP support' (Verhoest et al. 2015). In the second chapter, this dissertation develops a conceptualization of governmental PPP support with three dimensions: (1) Explicit PPP-policies and long-term political commitment; (2) a PPP-enhancing legal and regulatory framework; and (3) PPP-supporting arrangements, entailing a PPP-support unit, procedures for project appraisal and prioritisation, and standardised processes and documents (Verhoest et al. 2015: 123-126). Recently, Casady et al. (2019) develop a similar PPP institutional maturity model including the following dimensions: (1) legitimacy (PPP-enabling legal framework or regulatory regime), (2) trust (PPPs as a pragmatic NPG tool or political and social will), and (3) capacity (state and federal PPP-enabling entities or institutional support), which strongly correspond with our notion of governmental PPP support.

1.1.3. Literature gaps

Most PPP comparative researchers can be clustered into four different perspectives or levels of analysis being the macro-institutional and economic context at the country-level (macro-level); the level of governmental PPP support, the project process level and the project outcomes level (Verhoest et al. 2013, 2015; Boardman, Greve and Hodge 2015; Carbonara et al, 2015) (see figure 1).

First, several empirical studies of PPPs at the country level focus mainly on single-country research, for example: Canada (Vining & Boardman 2006); Australia (Jonston & Gudergan 2007); Portugal (Sarmento & Reneeboog 2014); and China (Chang 2013). The comparative studies that explain the national differences in PPP governmental support are still scarce. Such

studies comprise only two or three countries such as The US and the UK (Ysa 2007); British Columbia-Canada; Victoria-Australia and South Africa (Jooste et al. 2011); Netherland and Tamil Nadu (Matos-Castaño et al. 2014); and Ireland and the UK (Reeves 2015). Additionally, Geddes and Wagner (2013) analyze inter-state differences in PPP specific legislation within the United States. Only recently cross-country comparative literature on PPPs has emerged which points at substantial differences in governmental regulation and institutionalized support of PPPs (Jooste and Scott 2012).

Moreover, most of the scarce comparative studies that mapped PPP governmental support in different countries only compare one aspect of such governmental support like the impact of political risk on PPPs in 14 Asian countries (Sach, Tiong and Wang 2007); or the variation of PPP-supporting units in 19 European countries (van den Hurk et.al 2015). Moreover, Albalete, Bel, Bel-Pinana and Geddes (2015) describe the risk allocation schemes for different types in transport-related PPPs in a large number of South American (i.e. Chile, Brazil, Argentina) and European Countries (i.e. Spain, France, Poland). Only a few studies take their scope more broadly, like the study of Jooste, Levit and Scott (2011) on the development of a PPP-enabling field.

Thus, the PPP research is mostly dominated by studies on one or two countries and focuses on one aspect of governmental PPP support (gap 1). Chapter 2 and 3 aim (1), after having developed a multi-dimensional concept of governmental PPP support, to study the variations of this governmental PPP support in terms of policies, regulations and supporting arrangements in 20 European countries; and (2) compare these variations across these European countries in a comprehensive way.

Second, there is a lack of studies explaining why such variation in terms of governmental PPP support exists between countries. There are some studies which link this with the trend of public management reforms in Victoria and Denmark (Greve and Hodge 2007) and in Denmark and Ireland (Petersen 2011).

Research that investigates how country characteristics (i.e macro-institutional and macro-economic situation) influence the level of governmental PPP support is still underdeveloped (gap 2). Chapter 4 seeks to fill in this gap through (1) explaining the level of governmental PPP support by macro-institutional and macro-economic context; and (2) mapping and formulating typologies of countries as to the sub-dimensions of governmental PPP support, being the adoption of PPP-enhancing policies, PPP-enabling regulations and PPP-supporting arrangements.

Finally, several PPP comparative researchers also investigate PPPs in terms of specific modes of infrastructure and/or projects outcomes. On the one hand, many studies concentrate on specific infrastructures like health infrastructure in the UK (Greenaway et al. 2004) and Spain (Acerete et al. 2015); PPP hospitals in the UK and Spain (Hellowell and Vecchi (2015), PPP school projects in UK (Ahadzi & Bowles 2004) or sports infrastructure in Belgium (van den Hurk & Verhoest 2015), but with little reference to the project outcomes. On the other hand, studies focus on the general factors influencing the project success (e.g. Hammami et al. 2006; Galilea & Medda 2010; Zagosdzon 2013; Mota & Moreira 2015; Osei- Kyei & Chan 2015) and project failure in terms of cost overrun or delay (Flyberg et al. 2003; Chan & Park 2005; Nijkamp & Ubbels 1999; Morris 1990; Chantareli et al. 2012; Odeck 2004); or business failure

(Painvin 2010; Bain 2002, 2009; Bensoll & Kelly 2005; Miranda 2007; Vasallo & Solino 2006) without much attention for the influence of the infrastructure-specific elements.

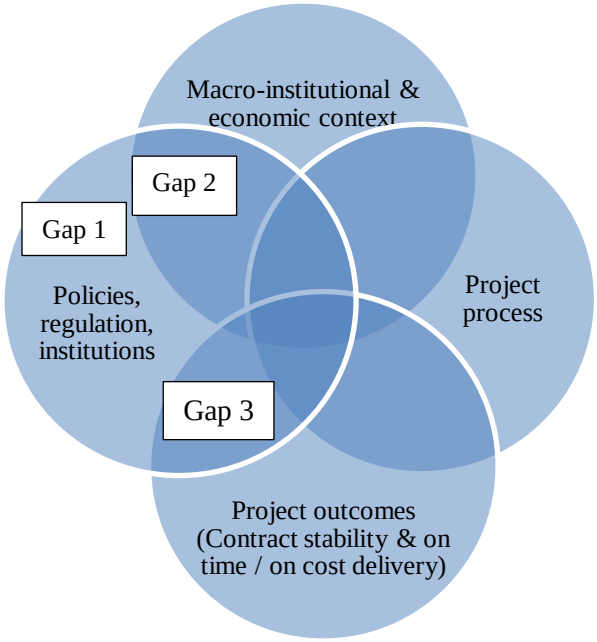

Figure 1 Literature gaps on comparative PPP research

Thus, the PPP research combining a focus on a specific infrastructure and on project outcomes (i.e contract stability and project success) is still underdeveloped (gap 3). To fill this gap, chapter 5 and 6 aim to study how the governmental PPP support in interaction with macro-level conditions and micro-level conditions affects project outcomes of transport-related infrastructure PPPs with respect to contract stability (the absence of contract renegotiation) and infrastructure delivery on time and on budget.

Overall, the existing empirical studies in comparative PPP research mostly focus on one country or topic. This dissertation investigates in a comprehensive and comparative way the interactions of conditions at the country-related macro-level, the governmental PPP support at meso-level, as well as the micro-level project governance processes for a specific mode infrastructure as well as the effect of the combination of these conditions on project outcomes in terms of contract stability on the one hand and on-cost and on-time delivery.

In sum, the main focus of the dissertation is how the meso-level factors related to governmental support for PPPs compare across countries, to explain these variations and studying the effects of these variations on project outcomes.

1.2. Theoretical framework

Based on the literature gaps identified above, this dissertation aims to explore the link between PPP governmental support and specific variables referred to the different gaps. Accordingly, this dissertation comprises four different levels of analysis being the country-specific macro-institutional characteristics, the country-specific governmental support for PPP, the project-

specific process and project outcomes (Pollitt & Bouckaert 2004; Verhoest et al. 2010; Verhoest et al. 2013, 2015; Carbonara et al, 2015; Liyanage & Villalba, 2015) (see figure 2).
Governments across the globe have responded differently to international pressures to adopt PPPs, which are propagated by international organisations and consultants. However, comparative research is still scarce. Previous studies (i.e. Delhi et al. 2010; Galilela & Medda 2010; Jooste et al. 2011; Matos-Castano et al. 2014; Mu et al. 2010) pointed to the influence of the institutional and political context as PPP-enabling factors. In this context, Mahalingam et al. (2011) developed the concept of 'PPP-enabling institutions' in terms of mechanisms that facilitate legitimacy, trust and capacity. While legitimacy is fostered by a supportive political environment and clear policies, trust between public and private actors is promoted by clear regulations, standards as well as clear roles for the public actor and the use of ex ante evaluation. An effective capacity is fostered by dedicated PPP-supporting units, expertise centralization at different levels of government, as well as learning and knowledge. These three mechanisms are connected and mutually reinforcing (Matos-Castano et al. 2014) and hence governments can create and use them to increase the PPP-readiness of countries.

How and through which mechanisms do countries adopt PPP support? Dolowitz and Marsh (1996) define policy diffusion as the use of knowledge about policies, administrative arrangements, institutions in one time and/or place for the development of policies, administrative arrangements and institutions in another time and/or place. Transnational policy diffusion may be induced by various mechanisms, namely coercion, competition, learning, and emulation (Gilardi 2012; Shipan and Volden 2008). Coercion is the imposition of a policy by powerful international organizations or countries; competition means that countries influence one another because they try to attract economic resources; learning means that the experience of other countries can supply useful information on the likely consequences of a policy; and emulation means that the normative and socially constructed characteristics of policies matter more than their objective consequences, leading to imitation policies of seemingly successful countries by other countries. Policy diffusion is also closely related with the process of isomorphism which DiMaggio & Powell (1983) distinguish into coercive adoption, normative adoption and mimetic adoption. Coercive adoption of policies across countries happens when governments, via laws or regulations, are instructed to implement certain standards. Normative adoption refers to the kind of dissemination and adoption that arises from the common norms, values, knowledge and networks held or engaged in by various professional groups, like consultants or public managers which are increasingly internationally networked. Mimetic adoption often occurs when governments try to emulate governments who are perceived to be successful. Thus, we expect that the variation of the level of PPP governmental support can be explained by country macro-institutional characteristics (i.e polity, culture, administrative history, and the macro-economic and financial situation).

According to the transformative perspective, as developed by Christensen and Laegreid (2001), the international and supranational pressures for PPPs, stemming from the mechanisms of policy diffusion indicated above, are being transformed when they meet the macro-institutional factors of a specific country. Verhoest et al. (2010) defines five macro-institutional factors at country-level. The first dimension, polity and politics, refer to the state structure (e.g unitary versus federal) and the political system (Hague & Harrop, 2007; Lijphart, 1999). The societal culture and legal tradition are the second macro-institutional variable (Hofstede & Hofstede, 2005; House et al., 2004). The third dimension is the administrative history and reform

trajectory of a country, which includes the realization of NPM-based reforms and measures of liberalization and privatization (Osborne & Gaebler, 1992; Painter & Pierre, 2005). Second, a country's socio-economic model or structure is, inter alia, formed by its welfare regime (Esping-Andersen, 1999) and varieties of capitalism (Nölke & Vliegenthart, 2009). Lastly, the financial-economic dimension addresses a country's macro-economic conditions, level of public debt and budgetary equilibrium, access to capital and credit markets, and the level of investment needs in infrastructure (European Commission, 2012; WEF, 2012; World Bank, 2012).

Finally, this dissertation also looks at the effects of variation of the PPP governmental support on the delivery of project outcomes, more specifically (1) on the contract management in terms of contract stability or without contract renegotiation and (2) projects success in terms of on time and within budget. Ideally, a higher level of governmental support for PPPs enables to manage the project properly. As a result, such governmental support can reduce the occurrence of contract renegotiation as well as allow the project success.

More in depth, the dissertation attempts to analyse to what extent the variation of governmental PPP support influences or prevents the occurrence of contract renegotiation. Markovsek et al. (2014) point at causes of contract renegotiation. They distinguish two main causes, which are exogenous as well as endogenous factors. They also point at two main relevant kinds of research on contract management and renegotiation. On the one hand, the objective research deals with management, performance and coordination, construction risk. economic downturn, change in demand, change in institutional environment and so on. On the other hand, the subjective research study on behaviour aspects of contract management (i.e, winner curse, opportunism, strategic misrepresentation) as well as public sector opportunism and principal-agent problems.

Likewise, Cruz & Marques (2013) also emphasise the exogenous (external factors to the PPPs contract) and endogenous factors (internal factors within the PPPs contract) in a different classification. The exogenous factors encompass: (1) external environments: the macro-economic environment, the justice system, political stability, political bias, force majeure, likelihood of repeated business; (2) the procurement process: type of award, number of bidders, award criteria; (3) the financing scheme: type of remuneration scheme and ratio debt versus equity; (4) the project characteristics: investment size and duration of contract; (5) the regulatory environment: existence of a regulator and type of regulation. The endogenous factors include: the risk sharing agreement, termination clauses, re-equilibrium clauses, and key performance indicators. Clearly, the presence of political stability, the procurement process and the existence as well as the role of regulatory institutions as elements of the PPP governmental support are also of substantial importance to reduce the likelihood of contract renegotiation. Other elements regarding contract management (i.e early termination, the relational governance and so on) are less studied.

Second, in the past decade, much research regarding PPP project outcomes has focused on critical success factors (CSFs) or on the determinants of project success (or the causes of projects being failed). It remains unclear how such factors interact with each other when causing project success or failure. As PPP research shows, PPP governmental support can be considered as one of the main drivers of project success, with political support (Jacobson & Choi 2008); appropriate regulations (Zagozdzon 2013); the implementation unit (Jamali 2004);

standardization of procedures (Azis 2004) being named as crucial elements. Similarly, the failure of projects have been explained by among others: inappropriate government policies regarding PPP (Chan & Park 2008); lack of regulations (Chan et al. 2010); and the failure of procurement process (Estache & Saussier 2014). This dissertation seeks to investigate to what extent these elements of governmental support for PPPs can influence or encourage PPP projects success in terms of projects being on time and within budget. However, this dissertation does not study other project outcomes (i.e quality, traffic, revenue) or stakeholder-related outcomes (like partner or user satisfaction).

The overall framework of this dissertation is shown in figure 2.

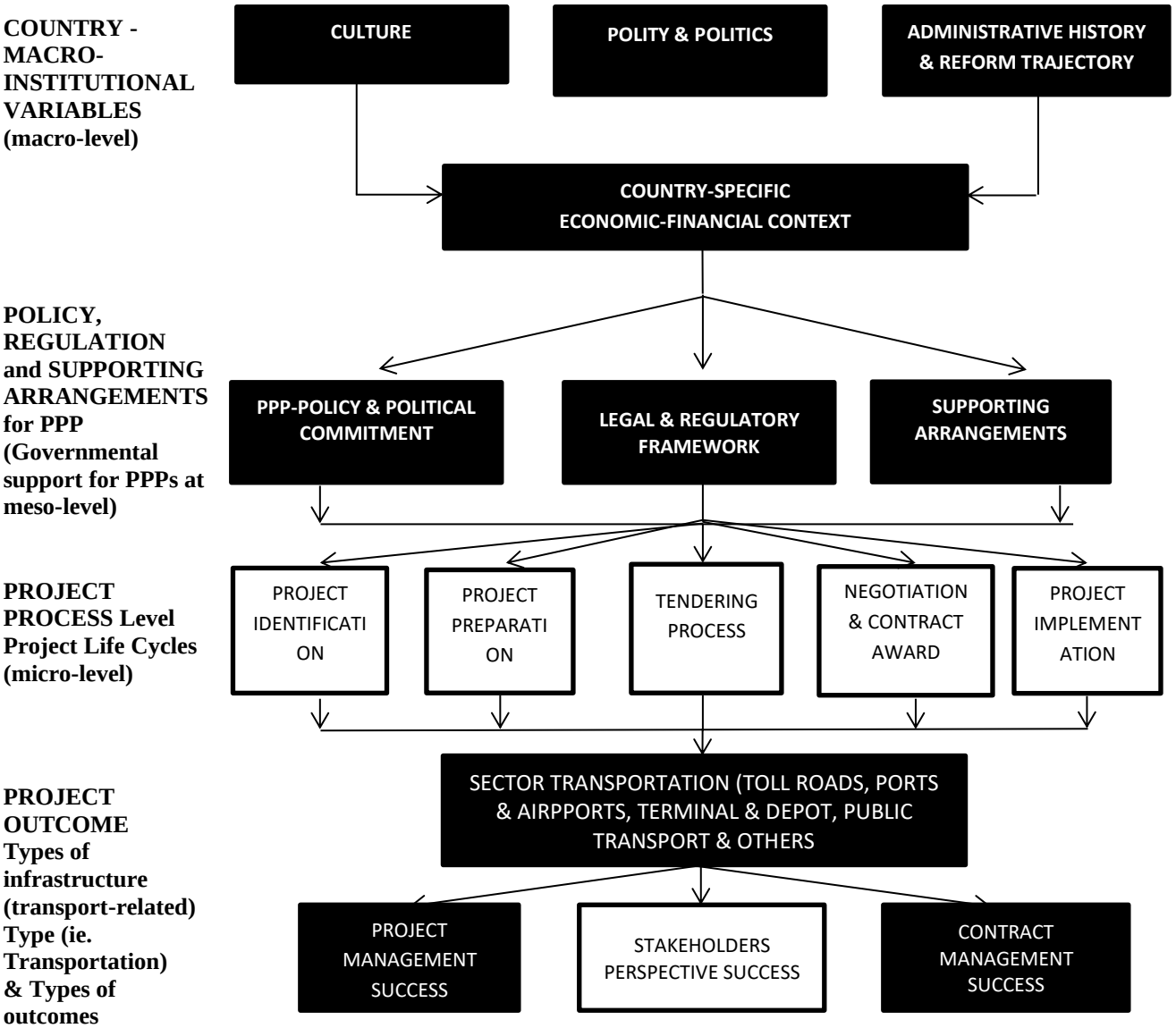

Figure 2: The different levels of analysis with respect to the development of PPPs (Adapted from Verhoest et al. 2010; Verhoest et al. 2013, 2015; Carbonara et al, 2015; Liyanage & Villalba, 2015)

This dissertation hence includes three main topics, which are the following: (1) how do the central governments support the development of PPP in different European countries and how

does this vary (theme 1); (2) how can the variation of governmental PPP support be explained by country-level macro-institutional and macro-economical characteristics (theme 2); and (3) how does this governmental PPP support in combination with macro-level and micro-level project-related conditions, impact upon project success (theme 3). Figure 3 shows the overview of the dissertation.

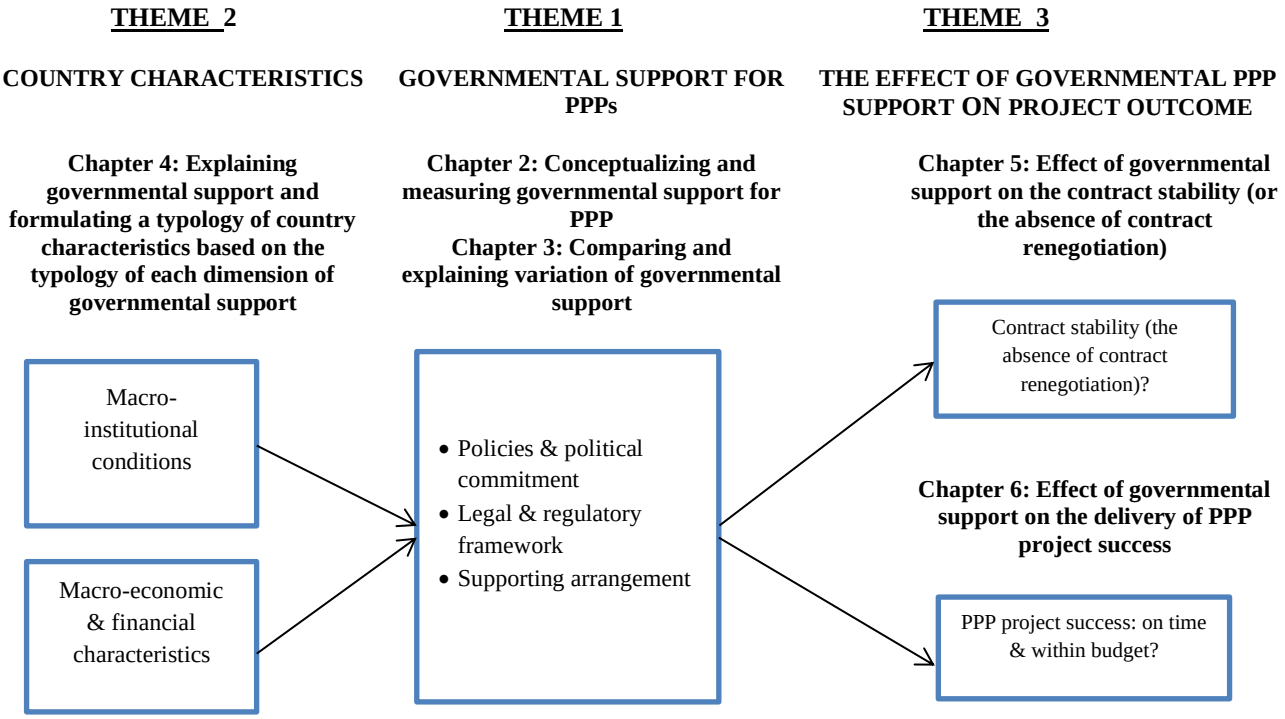

Figure 3: Schematic overview of the dissertation

1.3. Problem statement, research questions and contributions

The development of PPP projects in European countries shows a clear divergence in terms of their maturity of the PPP markets. As illustrated in figure 4, there is a lot of variation in PPP markets across 25 European countries (DLA Piper 2007; Keppler & Nemoz, 2010: and EPEC Market Update 2010, 2011, 2012 and 2013), in terms of volume of PPP deals (million €). As many sources noted, the United Kingdom is the most prominent country in terms of establishing PPPs (or PFI) by recording €74,184 million, up to 2013. Italy is the second largest PPP market with about € 68.505 million. Three countries, which are Spain, France and Germany, have developed PPP projects with a volume of more than €30,000 million. The development of PPPs in Greece has been stagnant since the Global Financial Crisis (2008/2009). The number of PPP project deals between 2003 and 2013 also varies across EU countries (not shown in figure 4). The largest number of PPP project deals are also found in United Kingdom (128 projects); France (79 projects); Germany (46 projects) and Spain (27 projects).

These differences in PPP-markets evoque the question *why countries vary in terms of the uptake of PPPs both in number and volume of projects? Do countries with a more extensive uptake of PPP (i.e The UK) have relatively more extensive governmental schemes to support PPPs?*

Conversely, do countries with immature PPP markets (i.e Austria) lack support schemes for PPPs?

Despite the global trend of positive PPP rhetoric, there is said to be widespread divergence in governments' policy, regulatory and institutional support arrangements for PPPs across otherwise largely similar countries in the Western world (Hammerschmid & Angerer 2005). The governance scheme of PPPs must be compatible with the macro-institutional context (Prats, 2019). Macro-institutional factors constrain or enable the development of certain policies, regulation and arrangements in countries according ot the 'logic of appropriatness (March and Olsen, 1989). Also, macro-economic factors as a major trigger for radical reformers program like PPPs (Pollitt and Bouchaert, 2011; Wollman, 2003), mould the country-specific translation of internationally propagated policy ideas (Chistensen and Laegreid, 2001). In addition, financial conditions like fiscal crisis are considered a main reason for governments to engage PPPs (see Checerita, 2009; McQuaid and Scherrer, 2010, but also Grimshaw et.al., 2002; Flinders, 2005). This dissertation focuses on how to conceptualise, measure, compare and to explain the variation in how goverments support PPPs: *How can the variation of governmental PPP support across countries be mapped? And how can the variations in terms of policies, regulations and supporting arrangements be clustered by representing specific typologies of countries? Moreover, how can we explain these variations between countries with respect to governmental PPP support in terms of macro-institutional and macro-economic conditions of the involved countries?*

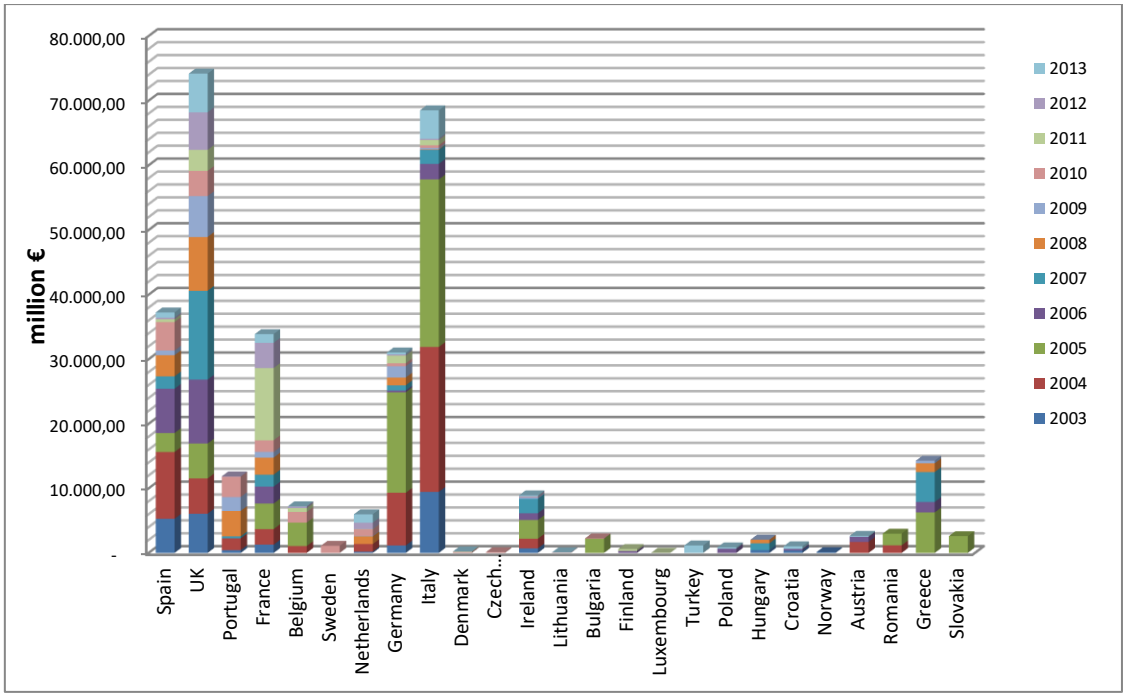

Figure 4. European PPP Market from 2003 to 2013
Sources: DLA Piper 2007; Keppler & Nemoz, 2010; EPEC 2010, 2011, 2012 & 2013

Besides a clear variation of the PPP maturity across European countries, there is also variation in terms of performance at the level of the PPP projects. For example, studies of more than 1.000 PPP contracts in Latin America from 1985 to 2000 indicate that the percentage of projects facing contract renegotiation during their contract term is very high, namely 41,5% on average

and 54,7% in the transport sector (Guasch 2004; Estache et al. 2009). Sarmento & Renneborg (2015) also found 254 renegotiated projects in Portugal (from 1995 to 2012), which manifested themselves mainly in the transport sector. Also, while an often-cited motivation of governments for adopting PPPs is to gain efficiency in terms of the delivery of PPP projects on time and within budget, studies found one third to one fourth of PPP projects being over time and over budget (NAO 2003; NAO 2008). Osei-Kyei and Chan (2017) emphasise that the top five important factors for keeping projects within time and budget include: (1) political support and acceptability for PPPs; (2) the governments' positive attitude towards private sector investments; (3) political stability; (4) a favourable existing legal framework; and (5) appropriate policies and (6) well-organised and committed contracting authority[1]. Given that governments develop such PPP support schemes, not only to enhance the uptake of PPP projects but also increase the success of such projects, there is a need to study *to what exent governmental PPP support in combination with other conditions, enhance the delivery of project success in terms of contract stability (RQ 3.1) and in terms of project delivery on time and within budget?*

Based on this outline of the problems, this dissertation therefore deals with three research themes and five central research questions. For each theme and research question we also formulate what the contribution is to the literature on PPPs.

Theme 1: Governmental PPP support across 20 European countries: measuring, comparing and clustering

The notion of PPP has been subject to the global interest and has been characterised as "a very-fashionable concept" (Wettenhal, 2003) and a model that enjoys "international acceptance" (Johnston & Gudergan, 2007). However, recent comparative research also indicates that the initiatives that governments have launched to promote PPPs differ considerably across countries with the result that significant differences in PPP-supportive institutional frameworks can be observed (Petersen, 2011).

RQ1.1. *How do central governments support the development of PPPs by providing PPP-enhancing institutions?* We deal with several sub-questions:

RQ1.1a *What aspects of the national institutional context are according to institutional theory-based literature and practitioner-oriented literature considered to be conducive for PPP development with a specific focus on those formal institutions governments can develop themselves?*

RQ1.1b *To what extent do countries with different politico-administrative systems differ with respect to these institutions?*

RQ1.1c *Are the country differences regarding the governmental support for PPPs associated with different levels of PPP take-up in these countries?*

This RQ1.1 is elaborated in Chapter 2 of this dissertation.

[1] This also refers to 'PPP governmental support.

Chapter 2 develops the concept of 'governmental PPP support (PPP-GSI)' (Verhoest et al. 2015) and using the constructed index, the chapter shows the wide variation across 20 European countries. The different governmental PPP support activities for PPPs do not necessarily come in a package. For example, the UK, the Netherlands and Germany score high in terms of the PPP-enhancing policies and political commitment as well as the PPP-supporting arrangements, but score low with respect to PPP-enabling legal and regulatory frameworks.

RQ1.2. *How do different European countries compare in terms of their governmental support towards PPPs?* and *with which other European countries do they cluster with regard to the development of policies and political support of PPP, legal and regulatory frameworks and supporting arrangements for PPPs?*

This RQ1.2 is discussed in chapter 3.

In sum, the *first contribution* of this dissertation is the conceptualization and measurement of governmental PPP support (chapter 2). The problem of good comparative research is most often measurement and more specifically, the comparability of measures used (Peters 2013). There is often a gap between the concepts researchers utilize and the measurement they use to provide an indication of the level of that concept in an observation (Mair 2008). This dissertation operationalizes governmental PPP support in such a way that it can be used as a reliable measure in cross-country comparisons. A *second contribution* to PPP literature is to formulate typologies of European countries as to their governmental PPP support (chapter 3). As Collier et al. (2012) points out, typologies are a well-established analytical tool in social sciences that make crucial contributions to diverse analytical tasks: forming and refining concepts, drawing out underlying dimensions, creating categories for classification and measurement and sorting cases. In this dissertation the use of typologies mainly related to this last analytical task.

Theme 2: Explaining variations of governmental support for PPPs across countries

But, how can we explain these country differences? The explanation of the level of governmental support across 20 European countries might be inspired by two strands of theoretical literature: (1) the public management literature concerning the varying national take-up of internationally propagated public management reforms (Wollmann 2004; Christensen and Lægreid 2007; Pollitt and Bouckaert 2017); (2) the literature on policy transfer and diffusion that analyzes why national governments do not (fully) adopt policies developed elsewhere (see e.g. Benson and Jordan 2011; Holzinger and Knill 2005; Marsh and Sharman 2009).

RQ2.1. *To what extent can the varying adoption of internationally propagated support schemes for PPPs and their sub-dimensions in terms of policies and political commitment, legal and regulatory framework and supporting arrangements across European countries be explained by specific macro-economic conditions combined with macro-institutional conditions?*

Following the transformative perspective (Christensen and Laegreid 2001; Wollman 2003; Pollitt and Bouckaert 2017), it is expected that some macro institutional features (polity, social culture, administrative reform history) as well as the macro-economic situation of a specific country, are either necessary or sufficient to explaining the levels of governmental support for PPPs.

The RQ2.1 will be discussed in Chapter 4.

Thus, as a *third contribution* to the PPP literature, this dissertation explains the cross-country variation of the different levels of PPP governmental support by 'country characteristics' through the interaction of macro-economic conditions and national institutional conditions, and for that the dissertation draws from two theoretical literatures on the cross-country transfer of public management reform and policy diffusion.

Theme 3: The effect of governmental support for the development of PPPs in transport infrastructure projects across European countries

In chapter 5 and chapter 6, we examine the extent of which the level of governmental support for PPPs affects the contract management success and projects management success. In this context, we examine the interaction between macro, meso and micro conditions for explaining outcome of interest. Recent studies using QCA align with this research, but focus on one level of analysis (for example: Casady (2020) examining the institutional drivers of PPP market performance; Du, J, Wu, H. and Zhao, X. (2018) explaining the capital structure of PPPs by external and internal factors; Verweijj (2015) examining satisfactory PPP projects outcome by management, project cooperation and project characteristics). In our study we combine conditions at different levels of analysis to explain PPP contract stability and project success.

We first study the effects of governmental support with respect to contract management in terms of contract stability. With respect to the contract management, project success manifests itself among others in contract stability. Contract stability refers to the sustainability of the agreement between public and private sectors for the duration of the projects with no contract renegotiation occurring. Contract renegotiation re-opens the contract and allows to make changes to its provisions, such as changes in risk assignment and/or conditions of contract, changes in project scopes etc. (Makovsek et al, 2014; Guasch et al, 2014). The consequences of contract renegotiation are twofold: (i) it weakens the incentives of the contractor to perform, and (ii) it may create serious distortions at the tender stage, giving incentives to bidders to act strategically (Iossa, 2014).

RQ3.1. *How does governmental PPP support (meso-level) affect contract stability in PPPs in European countries, and how does it combine with the macro-level business environment and factors at the project level (micro-level) in doing so.*

Several researchers investigate the phenomenon of contract renegotiation and the individual (independent) effect of determinants of contract renegotiation (Guasch et al. 2003, 2004, 2007, 2008; Guasch & Straub 2009; Estache et al. 2009; Montecinos & Saavedra 2011; Cruz & Marquez 2013; Sarmento 2014). Our study allows to combine the effect of macro-level, meso-level and micro-level conditions to look for which configurations enable contract stability, or conversely, contract renegotiation.

This RQ3.1 will be discussed in chapter 5.

The definition of project management success differs widely among researchers (Shenhar et al. 1997; Atkinson 1999; Lim & Mohammed 1999: Sadeh et.al 2000). However, the most practiced conceptualisation refers to the 'iron triangle' with cost, time and quality as crucial success criteria. The prime motivation for adopting PPPs in terms of efficiency is to have projects to be

delivered on time and within budget (see Chasey et al., 2017; O'Shea et.al, 2019 for a comparison between traditional projects and PPP projects).

RQ3.2 *To what extent does the governmental PPP support affect the project success and failure (being on/over time and on/over cost in the implementation stage) in PPPs in European countries, and how does this meso-level factor interact with the overall institutional and financial-economic contexts as a macro-level factor and project-specific micro-level factors in doing so?*

Several researchers study the factors contributing to the project success (Hammami et al, 2006; Galilea & Medda, 2010; Percoco, 2014; Zagozdzon 2013: Motta & Moreira 2015; Kyei & Chan 2015) or failure (Morris 1990; Foucacre et al., 1990; Mansfield et al. 1994; Nijkamp & Ubbels, 1999; Flyberg et al. 2003). Many factors are relevant. But again, whereas most of these studies focus on micro-level project-related features, few studies study the interaction of factors at macro-, meso- and micro-level to explain project success or failure. Chapter 6 explicitly looks at the effect of governmental PPP support in combination with macro-institutional and macro-economical features of the involved countries, as well as micro-level project-level conditions.

Hence, the *fourth contribution* of this dissertation is to study the effect of governmental PPP support in combination with macro-institutional/economical and micro-level project conditions on contract stability and project delivery on time and on cost of PPP projects in Europe.

1.4. Data and methodology

Besides the four substantive contributions of this dissertation, the dissertation seeks to make two other contributions, which are more methodological in nature. As a fifth contribution to the PPP literature, the dissertation uses data from two international comparative, standardized datasets, which were gathered with assistance of the author in collaboration with country teams within two European research networks, being the COST Action TU1001 and the H2020 BENEFIT project. The sixth contribution refers to the use of fsQCA on the one hand which allows to study the configuration of conditions which in combination bring a certain effect. Although FsQCA is increasingly used in PPP studies (see Warssen et al. 2019 for example), the combination of the datasets and this method brings new insights to the literature. Moreover, this dissertation attempts to enrich the research methodology for gaining more meaningful results using Multi Method Research (MMR). MMR has received great attention among QCA researchers (i.e. Lieberman 2005; Rohlfing 2008; Rohlfing and Starke 2013; Seawright and Gerring 2008; Ragin and Schneider 2011; Rihoux and Lobe 2009; Rohlfing and Schneider 2013; Schneider and Rohlfing 2013). This dissertation attempts to combine the QCA results and process tracing (PT) in order to understand better the causal paths observed in the analyses. We discuss these elements more in depth in this section.

1.4.1 Data

Data with respect to country-level aspects and governmental PPP support in the different European countries were mainly collected through the country templates (developed by the author and colleagues) within the COST Action TU1001 'Public Private Partnerships in Transport: Trends & Theory (P3T3)' and the resulting 2013 and 2014 Discussion papers 'Part 1 Country Profile'. In order to collect data at country level about the governmental PPP support

(see Annex A), the data collection was allocated to country teams which delivered a full country profile based on the analysis of legislation, policy documents, other documents and selected interviews. Country profiles consist of a narrative part and a standardised data set entailing the involved variables and indicators. Data delivered by country teams were checked for completeness and consistency, and additional data and/or clarifications from country teams were requested if necessary. The data on governmental PPP support per country refers to the moment of contract closure (see Annex C). Second, the data was validated by cross-checking it with other sources such as the COST Action TU1001 country templates and narratives, and data from EPEC and EBRD. To preserve the accuracy of data, we also apply an alternative procedure by using the 2013 value as a benchmark (see Verhoest et al. 2015) and tracing changes in the years before up to the moment of contract renegotiation.

This process yielded indicators for each country, which were finally coded by different coders[2] to avoid potential bias stemming from interpersonal differences in interpreting and coding of data and subsequently discussed between the involved coders in order to calculate the PPP-GSI (see Verhoest et al. 2013, 2015).

At the project level, a dataset with completed project templates was constructed within the BENEFIT Horizon 2020 project[3], and detailed case studies on most projects were published in the 2013 Discussion papers part 2 case studies and 2014 case studies report of the COST Action TU1001 European Union. Data on 49 European PPP projects were used in the dissertation (see chapter 5, and 6) (see Annex B). Country teams used extensive document analysis and desk research, sometimes complemented by interviews with the involved project managers, to fill in the project template and to provide the necessary data.

1.4.2. Methodology

(1) Case selection

The case selection is crucial in comparative case study research. Researchers generally select cases without regard of their value on the dependent variables, but ideally choose the population of cases through random selection on independent variables. However, both Mahoney (2007) and Goertz (2006) point at the relevance of taking into account how cases score on the dependent variable, and not only on the independent variables. More specifically under QCA method, Rihoux & Ragin (2009) highlight the good practices for case selection for small and intermediate N research: all cases share (1) enough background characteristics; (2) share a very clear definition of the outcome across cases; (3) include both cases with a 'positive' outcome and a 'negative' outcome; (4) the population or samples should not be taken as given; (5) the number of cases should be based on sufficient familiarity of researchers with each of the cases. Accordingly, this dissertation applies this recommended practice of case selection in QCA.

In terms of the included countries in this dissertation, data of twenty European countries were used in this dissertation and the selection of these countries is based on the following arguments.

[2] We are very thankful to Ole Helby Petersen and Walter Scherrer for the good cooperation in building this dataset and drafting publications building upon this dataset (Verhoest et al. 2015; Soecipto et al. 2016).

[3] Both prof. dr. Koen Verhoest and Murwantara Soecipto were involved in both the COST Action TU1001 and the H2020 BENEFIT project. We are thankful to Tom Willems, Martijn van den Hurk, as well as Eleni Moshouli of the Antwerpen team involved in these projects for their help in collecting the data.

First, the countries vary in terms of geographical situation: (1) Western (i.e Austria, Belgium-Flanders, France, the Netherlands, Germany and Switzerland); (2) Southern (i.e Cyprus, Greece, Italy, Portugal and Serbia); (3) Northern (i.e Denmark, Estonia, Finland, Sweden and the United Kingdom); (4) Eastern (i.e Czech Republic, Slovenia, Hungary and Slovakia). Moreover, the countries vary in their politico-administrative regime and tradition as these can influence the level of governmental support for PPPs. The countries belong to different politico-administrative traditions, being Nordic, Continental, Napoleonic-Latin, Central and East European Countries with the UK as Anglo-American country. Thirdly, countries have different state structures, with some have a more centralized state structure (i.e Czech Republic, Serbia), whereas others have a regionalised or federal system (i.e Austria, Germany, Switzerland) as well as more radical reformers (i.e the UK) to less radical reformers (i.e. Serbia). Fourth, the cultures of the included countries show variation in terms of uncertainty avoidance (as this is expected to impact upon the governmental support for PPPs) which varies from countries with very high uncertainty avoidance (i.e Greece, Portugal) to countries which have very low uncertainty avoidance (i.e Denmark, Sweden). Fifth, the inclusion of very different European countries yields substantial variation in terms of macro-economic conditions (i.e level of government debt and GDP per capita).

The projects that were selected have a substantial variation in terms of the conditions in our analyses: (1) the cases show variation with regard to the level of governmental support as well as its dimensions (policies, regulation and supporting arrangements); (2) variation with respect to the level of country competitiveness represented by the Global Competitiveness Index (GCI) from The World Economic Forum; (3) variation in terms of the mode of transportation (i.e. roads and non-roads); and (4) variation concerning the different project characteristics like contract duration, remuneration scheme, financing scheme and government guarantees.

(2) Selection of variables (conditions)

Yamasaki & Rihoux (2009) summarize six approaches for variables (conditions) selection[4]. We use both the comprehensive approach, in which all possible conditions were elaborated referring to literature as well as empirical evidence (see chapter 4 and 6) and the perspective approach (see paper 3 and 5). Rihoux & Ragin (2009) emphasise tlhe good practices of the selection of conditions in QCA studies: (1) the conditions must vary across cases; (2) the number of conditions should be relatively low – a large number of conditions makes it difficult to find any regularity or clear solutions; (3) a good balance between number of cases and the number of conditions (see further also Marx & Dusa 2011); and (4) the formulation of hypotheses that formulates the expected connection between conditions and outcome (Rihoux & Ragin 2009). We follow this good practices in this dissertation when we apply QCA.

(3)Methods of analysis

[4] These approaches are: the comprehensive approach – the full array of possible factors are considered in an iterative process; (2) the perspective approach –conditions representing two or three theories are tested in the same model; (3) the significance approach – the conditions are selected on the basis of statistical significance criteria; (4) the second look approach – the researcher adds one or several conditions that are considered as important although dismissed in a previous analysis; (5) the conjunctural approach – conditions are selected on the basis of "theories that are conjunctural or combinatorial in construction and that predict multiple causal combinations for one outcome; and (6) the inductive approach – conditions are mostly selected on the basis of case knowledge and not on existing theories (Yamasaki & Rihoux 2009).

The different chapters in this dissertation use different methods for analysis, which are explained in each chapter. However, most chapters use Fuzzy set Qualitative Comparative Analysis to study causal paths to explain the variation of governmental PPP support (Chapter 4) or to study its effects on project success (chapter 5 and chapter 6).

The fuzzy set Qualitative Comparative Analysis (fsQCA) is a comparative method that offers a middle path between quantitative and qualitative methods (Ragin 2008). It is called comparative because "it explores and finds similarities and differences in outcome across comparable cases by comparing configurations of conditions" (Ragin, 1987; Rihoux & Ragin, 2008). The method allows us to scrutinizing the conditions that are necessary and sufficient to bring about a certain outcome. The method refers to the so-called INUS conception of causality. X is a *necessary condition* for Y is to say that it is impossible to have Y without X (X ← Y). X is a sufficient condition for Y is to say that the presence of X guarantees the presence of Y (X → Y). a fs QCA is thus a set-theoretic approach (Ragin 2000). Set-theoretic approaches describe causal complexity in terms of relationships between conditions (independent variables) and an outcome (dependent variable).

We use Fuzzy Set Qualitative Comparative Analysis (fs QCA) to analyse a set of causal theories between outcome and conditions (see chapter 4, 5, and 6). The method allows us to see which conditions are necessary and sufficient to bring about a certain outcome. There are three reasons/arguments why QCA is used. First, a fuzzy-set QCA is highly appropriate for analysing medium N cases (12 to 70 cases). Previous research has pointed out the benefits of using fsQCA on a medium-sized dataset, compared to traditional regression analysis (Vis, 2012). Second, a QCA allows us to test the hypotheses or existing theories. More specifically, the researchers aim at operationalizing the theory or hypotheses as explicitly as possible by defining a series of conditions that should yield a particular outcome (Rihoux & Ragin, 2009). Third, QCA forces researchers to achieve conceptual clarity through the calibration procedure, in where the cases are assigned to sets (Schneider & Wagemann, 2010).

QCA builds upon three basic assumptions: equifinality, conjunctural causation and causal assymetric (Rihoux & ragin 2009). First, a conjunctural causation means a condition will only have an effect in combination with other condition. A combination of causally relevant conditions A and B together generates the outcome Y (AB → Y). Second, equifinality means different causal paths can lead to the same outcome. For example, several different combinations of conditions may produce the same outcome (AB + CD → Y). Finally, causal asymmetry means the presence and the absence of the outcome may require substantially different explanations.

As Rihoux & Ragin (2009) suggested, it is important to formulate a clear hypothesis for each condition regarding its connection to the outcome. The hypothesis (proposition) may also be formulated in the form of a conjunctural causation on how a combination of conditions may lead to the outcome.

The found solution formula should be linked back to cases, preferably through graphical representation tools (Schneider & Wagemann, 2010; Goertz, 2006). The benefit of using a

graphical tool (X-Y-Plots) is twofold. First, X-Y-plots display either entire solution formula and/or different paths towards the outcome, where single cases fall on the fuzzy scales of the outcome and (conjuntural) conditions. Second, X-Y-plots provide a series of checks for assessing the quality of fs-QCA. More importantly, X-Y-plots also show whether the specific condition is necessary (lower triangular plot) or sufficient (upper triangular plot) (Schneider & Wagemann, 2010). Therefore, when we use fs QCA in a chapter, each solution path is visualized by using XY plots to check the accuracy of the results. Also, we use process tracing to strengthen the findings of the QCA analyses.

The process tracing is an invaluable complement for QCA to discern the causal mechanism behind a set-relational pattern and further improve the theory and the observed QCA model. However, we only focus on Post QCA process tracing, as the process tracing can then rely on the QCA results in terms of typical and deviant cases, which would be impossible in pre-QCA research, because of several reasons (Schneider & Rohlfing, 2013). First, model-related reasons can only be investigated once a model has been established with a QCA based on a well-crafted truth table. Second, post-QCA process tracing is based on a broader empirical basis because it draws on multiple truth table rows, whereas pre-QCA analysis is limited to a single row. Third, pre-QCA case studies tend to focus more on deviant cases with regards to consistency when investigating contradictory truth table rows, whereas in post-QCA process tracing the distinction between deviance in consistency and coverage is crucial. Lastly, in post-QCA, the differences between statement of necessity and sufficiency are fully taken into account.

1.5. Outline of dissertation

To sum up, this dissertation addresses several research questions which are related to the variation, explanation and effects of governmental support to enhance Public Private Partnerships (PPPs). The outline of dissertation is depicted on table 1.

Table 1: Outline Dissertation

Chapter	Focus	Research Question in chapter	Method	Status	Authors
(1) How do governments support the development of Public private partnerships? Measuring and comparing PPP governments support in 20 European countries	RQ1.1.	*How do central governments support the development of PPPs by providing PPP-enhancing institutions?*	Qualitative approach	Published in Transport Reviews Vol. 35 (2), 118-139 Transport Reviews is a Q1 journal in its field.	Verhoest, Petersen, Scherrer & Murwantara
(2) Diverging and Converging PPP Policies, Regulations and Supporting Arrangements? A comparative Analysis of twenty European Countries	RQ2.1	*How do different European countries compare in terms of their governmental support towards PPPs?*	Quantitative approach (Cluster analysis)	Published in Book Chapter in Routledge Studies in Transport Analysis: *Public-private partnerhips in Tranport: Trend and Theory.* Athena Roumboutsos (eds) 2016.	Murwantara, Verhoest, Petersen & Scherrer
(3) Why do countries differ in terms of governmental support for Public-private	RQ2.2	*To what extent can variations in governmental PPP*	Fuzzy set-Qualititative Comparative	Not published yet, but has been presented at	Murwantara, Verhoest,

partnerships (PPPs)? Explaining variations in PPP support in twenty European countries		*support across countries be explained by macro-institutional and macro-economic features of these countries, and by combinations of these features?*	Analysis (fs QCA)	International Conference on Public Policy, Milan, 2015	Petersen & Scherrer (version in PhD)
(4) Contract stability in European road infrastructure PPPs: How does governmental PPP support contribute in preventing contract renegotiation?	RQ3.1	*How does governmental PPP support (meso-level) affect contract stability in PPPs in European countries, and how does it combine with the macro-level business environment, and factors at the project level (micro-level) in doing so.*	Fuzzy set-Qualititative Comparative Analysis (fs QCA)	Published in *Public Management Review* Volume 20, 2018 – issue 8, 1145-1164 Public Management Review is a Q1 journal in its field (Public Administration).	Murwantara & Verhoest
(5) How governmental support can help to deliver PPP projects on time and within budget: a qualitative comparative analysis of infrastructure projects in different European countries	RQ3.2	*To what extent does the governmental PPP support affect the project success and failure (being on/over time and on/over cost in the implementation stage) in PPPs in European countries?* and *how does this meso-level factor interact with the overall institutional and financial-economic contexts as a macro-level factor and project-specific micro-level factors in doing so?*	Fuzzy set-Qualititative Comparative Analysis (fs QCA) & process tracing	Not published	Murwantara

Section 1

PPP Governmental Support across 20 European countries: Measuring, Comparing and Clustering

Chapter 2

How do governments support the development of Public Private Partnerships? Measuring and comparing governmental PPP support across 20 European countries

Published in Verhoest, K., Petersen, O. H., Scherrer, W. & Soecipto, R. M. (2015). 'How do governments support the development of Public Private Partnerships? Measuring and comparing governmental PPP support across 20 European countries. *Transport Reviews*, 35 (2), 118-139

2.1 Introduction

Over the past decades, policies and institutions to promote the uptake of public-private partnerships (PPPs) have diffused across the world (Klijn & Teisman, 2003; Hodge et al., 2010). At the same time there is now a growing awareness that the development of PPPs has evolved very differently across national institutional contexts (Petersen, 2011), and national governments have responded very differently to the PPP reform trend (OECD, 2008; Verhoest et al., 2013). These country differences have, however, been insufficiently systematically mapped and accounted for in previous research, which is largely a result of the fact that the PPP literature has hitherto been characterised mainly by single country studies whereas comparative research has been limited (for a few exceptions, see Greve & Hodge, 2007; McQuaid & Scherrer, 2010; Petersen, 2011; Jooste & Scott, 2012, Matos-Castaño, Mahalingam & Dewulf, 2014). While there is growing academic and political interest in comparative issues related to PPPs and their implementation, there is an evident need for comparative analyses in order to understand the large national differences in the development of PPP policies and institutions and their consequences for uptake of PPPs across different countries.

In this chapter, we examine some of the crucial elements of the national institutional context for development of PPPs in transport infrastructure and in other sectors. Our focus is on the way central governments support the development of PPPs by providing PPP-enhancing institutions including clear policies and political commitment, appropriate legal and regulative frameworks and dedicated PPP-supporting units. We address the following research questions: What aspects of national institutional context are in institutional theory-based literature and practitioner-oriented literature considered to be conducive for PPP development with a specific focus on those formal institutions governments can develop themselves? To what extent do countries with different politico-administrative systems differ with respect to these institutions? Are country differences regarding government support for PPPs associated with different levels of PPP take-up in these countries?

In order to answer these research questions, we build a comprehensive 'PPP Governmental Support Index' (PPP-GSI) for 20 European countries reflecting: (i) the extent to which policies and the political environment is conducive or prohibitive to PPPs; (ii) whether specific PPP laws and/or soft types of regulations have been put in place; and (iii) the existence or non-existence of specialised PPP-supporting arrangements such as dedicated PPP units, standard frameworks and green-lighting procedures[5]. Our analysis is limited to the public support infrastructure for PPPs. This means that private institutionalised PPP support, which for example includes the banking sector, credit systems and availability of private consultancy expertise, are issues that are outside the scope of this article. Subsequent PPP research might utilise the knowledge gained from the comparative PPP-GSI to study policy diffusion and transfer processes in order to understand the spread of PPP-supporting policies, regulations and other arrangements and how these elements serve as barriers to the development of infrastructure PPPs.

The chapter is structured as follows: we start with a discussion of national PPP contexts from an institutional perspective (Section 2). Then, we develop the PPP support index indicating the extent to which the governmental support for PPPs within a country is conducive or inhibitive for the introduction and diffusion of PPPs in transport/infrastructure (Section 3). Subsequently, we cluster

[5] This analytical framework was developed within AWG1of the COST TU1001 Action on PPPs in Transport.

countries and assess similarities and differences in the governmental support of PPPs in a comparative analysis of 20 European countries (Section 4). Then, in the penultimate section, we explore the link between governmental support and the uptake of transport and infrastructure PPP projects in different countries (Section 5). Finally, we discuss the usefulness as well as the limitations of the PPP-GSI and provide a conclusion (Section 6).

2.2 National PPP context: An institutional perspective

Increasingly, academic literature argues that the variations in PPP diffusion and performance across countries is to a considerable extent influenced by the institutional and political context of these countries, leading to weak or strong 'PPP-enabling fields' (Delhi, Palukuri, & Mahalingam, 2010; Meunier & Guinet, 2010; Galilea & Medda, 2010; Jooste, Levitt & Scott, 2011; Mu, de Jong, & Heuvelhof, 2010; Matos-Castaño et al., 2014). Within economic and sociological neo-institutional theories, institutions are seen as the set of socially constructed frameworks of symbols and resources that both constrains and enables social action (North, 1990; Scott 2001). Institutions can range from formal to informal frameworks: regulative frameworks refer to public policies, legal and procedural frameworks and other formal mechanisms, and the shared social understanding thereof. Institutions can also arise from normative or cognitive frameworks, referring respectively to values and norms for appropriate behaviour and to belief systems and mindsets which unconsciously influence human behaviour. In this article we focus on formal institutions to provide a data-set that could be defined and collected in a standardised way across a large sample of countries and which are claimed by both academics and practitioners to matter for PPP development. However, we acknowledge the importance of informal norms and cognitive frameworks as they influence the behaviour of both public and private actors within PPPs. Moreover, such frameworks support and shape the more formalised institutions (Matos-Castaño et al., 2014). But such informal norms and cognitive frameworks are very hard to map systematically in a multi-country study.

But which formal institutions matter for the development of PPPs? Mahalingam et al. (2011; see also Matos-Castaño et al., 2014) developed a framework in which they categorize PPP-enabling institutions into mechanisms that facilitate legitimacy, trust and capacity, and link this with earlier academic work (see e.g. Delhi et al., 2010; Jooste et al., 2011). In their view, legitimacy is fostered by a supportive political environment and clear policies, as well as transparent procurement procedures, whereas trust between public and private actors is fostered by means of clear regulations, standards, clear roles of public actors and ex ante evaluation. Effective capacity to manage PPPs is fostered by expertise centralisation at different levels, dedicated units, systems for learning and knowledge diffusion, and appropriate risk and financing mechanisms. Matos-Castaño et al. (2014) argue that these sets of mechanisms are connected and mutually reinforcing.

These mechanisms are also considered to be crucial in the practitioner world of PPPs. International organisations, regional development banks like the Asian Development Bank and the EIB, affiliated units like EPEC and UNECE, and private agents involved in PPP (see e.g. Deloitte, 2007; EIB, 2011; Economist Intelligence Unit, 2011; EBRD, 2012; EPEC, 2011a; OECD, 2008; UNESCAP, 2005; World Bank & PPIAF, 2006) propagate the adoption of a kind of ideal-type institutional setting, encompassing (a) clear policies and political commitment; (b) legal and regulatory

provisions; and (c) supportive arrangements for expertise, procurement and contract management, standardisation and evaluation in order to enhance the prosperous development of PPPs. These three groups of mechanisms which governments can create and use are considered to determine the PPP-readiness of countries alongside contextual elements which are less under direct control of government, such as mature financial markets, and the macro-economic business and investment climate in a country.

Alongside other factors like the need for public investments, the normative pressure stemming from these international organisations and consultancy firms creates strong isomorphic pressures on national governments to create ideal-type governmental support for PPPs (DiMaggio & Powell, 1983). But these isomorphic pressures may also be coercive in kind, with for example the European Commission and Eurostat setting regulations for public procurement and public debt (Petersen, 2010). Further, there may be mimetic isomorphistic pressures on national governments to copy from 'better-performing' countries, affecting the willingness to embrace PPP as a tool for public investments (Pollitt & Bouckaert, 2011). Because of these isomorphistic pressures we would expect similarity in the behaviour of political principals and administrators who design policies and supporting arrangements for PPP. However, as argued in the literature (e.g. Jooste et al., 2011), countries differ considerably regarding the extent to which they provide governmental support for PPPs in terms of policies and political support, legal frameworks and supporting arrangements.

According to the transformative perspective (Christensen & Laegreid, 2001; see also Wollmann, 2003; Pollitt & Bouckaert, 2011), these international and supranational pressures for PPP-enabling institutions are being transformed when they meet the macro-institutional factors of a specific country, like the polity, societal culture, administrative history and the national economic financial context, which may lead to different responses and deliberative actions in terms of governmental support for PPPs between countries. This implies that countries with different polity features and cultural features are expected to adopt internationally propagated ideas about PPP governmental support in different ways. Theoretically, this idea of transformation is partially rooted in historical institutionalism (Steinmo et al. 1992): reforms and changes of policy design within countries are path-dependent, and international doctrines have to align with past administrative history and politico-administrative cultures in order to be adopted. Although the 'official rhetoric' about PPPs may reflect internationally proclaimed doctrines, the policies, regulation and supporting arrangements chosen and the behaviour of politicians and administrators may differ (Pollitt, 2001). In consequence, PPP governmental support in terms of policies, regulations and supporting arrangements across countries with different politico-administrative systems are expected to show substantial variation.

From this perspective this article aims to make the following contributions to literature. First, after reviewing relevant academic literature we define the different components of PPP governmental support as deemed necessary and desirable by international organisations and consultancy firms, by reviewing practitioner-based sources. Thus we can operationalise the elements which are also listed in the academic institutional theory-based literature (see above, e.g. Delhi et al., 2010; Jooste et al., 2011; Matos-Castaño et al., 2014) in sub-elements and measurable indicators. Secondly, we develop an index which allows us to compare the governmental support for PPPs in different European countries with different politico-administrative systems, and assess the differences in terms of governmental support between these countries as would be expected based on the transformative perspective. Thirdly, we make an explorative assessment as to whether or not differences in PPP

governmental support are indeed associated with different levels of PPP take-up in a country, which is a claim made both in academic and practitioner literature.

2.3 Defining governmental support for PPPs: Policy, regulation, and supporting arrangements

In this section we cluster the formal institutions which create a PPP enabling field (Jooste et al., 2011), mentioned in academic literature, into three main dimensions which we substantiate and make measurable in order to construct the PPP-GSI. Governments are said to mainly develop their support for PPPs along three dimensions: by designing policies and expressing political commitment, by articulating the legal and regulative framework and by creating supporting arrangements. As academic sources remain at a quite general level on how to further detail and operationalise these main dimensions, we will use practitioner-oriented literature produced by international organisations and consultancy firms which provide guidelines for governments.

Explicit PPP policies and long term political commitment – which refer tothe *first dimension* of governmental support for PPPs – are crucial to create legitimacy for it as a public investment instrument (Matos-Castaño et al., 2014), which will in turn stimulate the growth and the development of a pipeline of projects. Long-term policy and political commitment is seen in PPP literature as a key variable with which to manoeuvre successful PPPs projects (see Flinders, 2005; Johnston, 2010; Jooste et al., 2011; Dehli et al., 2010). Moreover, PPP policies serve to define PPP in comparison to other infrastructure service procurement options, as well as to describe the reasons and goals for adopting the schemes. Finally, PPP policies can encourage good relationships by directing and coordinating cooperation between interested sectors and government institutions. Of crucial importance, according to the more detailed practitioner literature, are the existence and regular update of an explicitly adopted policy document on PPPs, as well as a clear programme for specific PPP projects. Moreover, clear political support for PPPs expressed by the main political parties with some stability over time is said to be crucial (see IMF, 2004; UNESCAP 2005; OECD, 2006; Deloitte, 2007; World Bank and PPIAF, 2012). An outline of a proposed PPP policy covers the following topics: definition and scope; objective of the PPP programme; principles of PPP agreements; risk allocations in PPP projects; establishment of PPP unit; PPP procedures and auditing the PPP programme (PPIAF, 2012).

The legal and regulatory framework on PPP represents the *second dimension* of government support for PPP. Research has illustrated that both “hard” and “soft” regulations apply to PPPs (see Mörth, 2007; Bovis, 2013) which can either be enabling or prohibitive for the uptake of PPPs in various national contexts. Moreover, a high diversity in national approaches to the regulation of PPPs is found in the literature, with some countries having launched specialised PPP laws and formal procedures for financing and green-lighting of projects, whereas others have adopted a less formalised and essentially more decentralised approach (Petersen, 2011; Bovis, 2013). This dimension relates to the presence and content of a specifically stipulated legal framework for PPP, and relevant provisions in PPP-related and public procurement regulation (World Bank and PPIAF, 2012; see also FIMA s.d.; UNCITRAL, 2001; EIU, 2011). The perhaps most detailed overview of relevant legal and regulatory dimensions for PPPs has been provided by the European Investment Bank (EIB, 2011) and the European Bank for Reconstruction and Development (EBRD, 2012) and will be used to construct this part of the PPP-GSI (see Table 2).

The *third dimension* in which governments may support PPPs explicitly is that of PPP-supporting arrangements, of which the existence of a dedicated PPP unit is one crucial element. The role and functioning of PPP-supporting arrangements has recently become a major theme in research; such units are considered to be major players vis-à-vis shaping the national and local institutional conditions for PPP development (Jooste et al., 2011; Mahalingam et al., 2011). The implementation of PPP policies and the development of projects are thus likely to be affected by the presence or absence and working of these institutions in relation to their role and functioning, organisational structure, formal authority, working procedures and institutional logic (Jooste & Scott, 2012; Farrugia, Reynolds & Orr, 2008). According to a number of policy and practitioner-oriented papers, relevant elements in a supportive institutional framework include: a) the formal organization of PPP units or agencies and their role; b) the presence or absence of fixed procedures for PPP project appraisal and prioritisation; and c) standardised PPP contracts and/or processes for implementing PPPs (EIB, 2004; OECD, 2010; World Bank & PPIAF, 2006).

Table 2: Operationalisation of PPP Governmental Support into the PPP-GSI-index

Dimension	**Indicators**		**Sub-indicators**	**Scores**			
				4	**3**	**2**	**1**
Policy and political commitment	33,33%	Existence of a strategy document of PPP policy		Yes, published before 2006 and updated afterwards	Yes, published before 2006, but not updated	Yes, recently published and not updated	Non-existent
	33,33%	Existence of a general PPP programme		Yes, incl. transport-specific programme, clear time schedule	Yes, incl. transport-specific programme, but no clear time schedule	Yes, but only general PPP programme, no clear schedule	Non-existent
	33,33%	Political support		Rather strong, stable or increasing	Rather strong, decreasing	Rather low, increasing	Rather low, stable or decreasing
Legal and regulatory framework	50%	Specific PPP or concession law: (a) existence	(1) General PPP or concession law; (2) PPP law in transport; (3) procurement law; (4) in-line with EU definition of (1) PPP; (2) eligible sectors and types of infrastructures/ services; (3) contracting authorities; (4) eligible private party	All four criteria are met	Three criteria are met	Two criteria are met	One or no criterion is met
	50%	Specific PPP or concession law: (b) scope regarding definitions of four items		All four criteria are met	Three criteria are met	Two criteria are met	One or no criterion is met
	50%	Elements provided in the general legal framework (including public procurement law)	4 sub-indicators covering procedures and recommendations, 5 sub-indicators about mandatory provisions in PPP contract[6]	8 to 9 sub-indicators are met	6 to 7 sub-indicators are met	4 to 5 sub-indicators are met	0 to 3 sub-indicators are met

[6] Does the prevailing legislation include provisions and procedures regarding the following elements: election of private partner through competitive procedures; non-competitive procedure in exceptional circumstances; procedures for unsolicited proposals; review procedures; contract termination events; compensation provisions; provisions for collection of fees or payments by government; public authorities to support and provide guarantees and step-in rights for lenders or substitution by a new private partner?

PPP-supporting bodies	33%	Acting public institutions/PPP-supporting units	Existence of a PPP support unit	Yes, since before 2006	Yes, since 2006 or later	No, not anymore	No, never existed
			Legal and organisational basis of PPP support unit	Private legal body with private sector participation	Private legal body without private sector participation	Public (law) body under ministry	Non-existent
			General functions PPP Support unit	Dissemination, policy function and green lighting	Dissemination and policy guidance or green lighting	Dissemination only	Non-existent
			Staff size of unit	20 or more	5 to 20	< 5	Never existed
	33%	Procedures for project appraisal and prioritisation, role of main sectors in project stages	Existence of standard ex ante evaluation instruments	Mandatory for all projects	Mandatory beyond threshold	Existing, but not mandatory	Non-existent
			Use of standard ex-ante evaluation in PPP projects	Used in all projects	Used in majority of projects	Used in minority of projects	Not used
			Existence of a third party scrutinizing and approving PPP projects before project on tender	Yes	Yes, beyond certain threshold	No, not anymore	Not at all
			Existence of a third party scrutinising and approving PPP projects before final contract signed	Yes	Yes, beyond certain threshold	No, not anymore	Not at all
	33%	Standardised processes and documents for PPPs in transport	Use of standardised contracts for PPP in transport	Used in majority of projects	Used in minority of projects	Existent but not used	Non-existent
			Use of standardised PPP model in transport	Used in majority of projects	Used in minority of projects	Existent but not used	Non-existent

Table 2 lists the elements of the three dimensions of governmental support for PPPs that capture the main formal mechanisms of governmental support for PPPs which are directly under control of governments. This distinguishes the PPP-GSI from other indices which measure a country's PPP-conducive context using labels like 'PPP-readiness' (UNESCAP, 2005; Economist Intelligence Unit EIU, 2011), 'PPP maturity level' (Deloitte, 2007) and 'quality of PPP legislation' (EIB, 2011; EBRD, 2012) in various ways. Three of these indices (UNESCAP, Deloitte and EIU) have a broad scope and encompass many qualitatively very different contextual elements. UNESCAPs' national PPP readiness measure includes also non-PPP specific issues related to general investment climate and social climate, next to elements of governmental support. The EIU measures PPP readiness using six dimensions like financial facilities, but does not take into account the PPP policy and political commitment of the government to undertake projects. The EIB index concentrates on the assessment of the quality of the PPP legislation and the effectiveness of its implementation. Lastly, the Deloitte (2007) index uses a different set of parameters to represent the level of maturity of development of PPP projects and includes besides political climate, also local geography, capital market sophistication, and partnership formation factors.

This review shows that PPP-readiness or maturity of a country refers to more than governmental support, but also to macro-institutional and non-institutional elements which are not directly under control of government. These wider concepts also encompass the non PPP-specific investment climate, social climate, and capital market availability. Our focus on governmental support for PPPs is clearly more focussed and narrow, but it avoids lumping together qualitatively different aspects

related to macro-economic and financial issues. We certainly do not argue that these wider elements are irrelevant, but we plea for a differentiation of contextual elements directly under control of government versus contextual elements which are hard to influence by national governments. In that respect, none of the four existing indices provide an index that includes all aspects of governmental support regarding PPPs, being policy and political commitment, regulatory measures and PPP-supporting arrangements, which jointly constitute the most direct tools for government to stimulate PPPs.

2.4 Collection and validation of data

This article maps and compares the governmental support in 20 European countries, which have different politico-administrative traditions and regimes, including Nordic, continental, Napoleonic-Latin, Central and East European former-communist countries, and UK as an Anglo-American country (Painter & Peters 2010). This variation in politico-administrative regimes enables us to map divergent degrees of governmental support for PPPs, as we would expect based on the institutional and transformative perspective we take in this article (see section 2). Furthermore, as most countries are member of the EU, or closely affiliated to it (Switzerland), a harmonising effect on the legal and regulatory framework can be expected. Due to limitations in data-gathering, though, we did not manage to include some important countries with regard to PPPs, like Ireland, Spain and Poland.

The development of the indicators, their measurement and the collection of data were carried out as part of the COST TU1001 Action on PPP in transport. The data collection was allocated to country teams which delivered a full country profile based on the analysis of legislation, policy documents, other documents and selected interviews. Country profiles consist of a narrative part (see Verhoest et al., 2013) and of a standardised data set alongside the variables and indicators listed in Table 1. Utilising country teams had the advantage that data collection was carried out by researchers with in-depth contextual knowledge about national institutions and practices. In comparative studies contextual knowledge is crucial (also because of language issues) in order to secure a high validity and reliability. The disadvantage of working with country team centres on the risk of variations in data collection or different ways of reporting highly contextual national data. We attempted to address this issue by developing the indicators in joint seminars, in which most country representatives participated and sorted out the main conceptual differences between countries, and by providing detailed guidelines to country teams with an explanation of each item in the template. Data delivered by country teams were checked for completeness and consistency, and we required additional data and/or clarifications from country teams if necessary. This process yielded indicators for 20 countries, which were finally coded by three persons independently to avoid potential bias stemming from interpersonal differences in interpretation and coding of data, and subsequently discussed in order to calculate the PPP-GSI (see Table 2).

Political commitment and the process of building governmental PPP support can vary over time (for example some countries that previously had a mature PPP policy and unit had been reforming or even dismantling it, such as the UK). Some indicators or sub-indicators in the index try to capture evolutions over time (see the indicators for policy and political commitment, and PPP unit existence), but for most dimensions, the PPP-GSI index is mainly static and based on the situation as of April 2013. The distinct decentralised decision structure in some countries notwithstanding,

country data generally refers to the situation at the central government level[7]. Finally, the three dimensions of the PPP-GSI are weighted equally, and the sub-indicators within the three dimensions are given equal weights too. In line with international academic literature where authors who make 'composed' indices choose for unweighted calculation (see e.g. the Gilardi Regulatory Independence index; Gilardi 2008), we considered it to be very difficult to estimate the precise weight which should be allocated to the different dimensions and indicators of governmental support for PPP. Different public and private actors within and across countries would probably differ substantially in terms of their assessment of the importance of the respective elements and dimensions. Also the academic literature is not yet at a stage in which we could distil the relative importance of the different elements.

In order to overcome this problem and in order to test the robustness of our country ranking and classification, we performed a cluster analysis in which we included all indicators of the three dimensions of the PPP-GSI. The results indicate that the unweighted calculation of the PPP-GSI index results in a ranking and categorization of countries which is reasonably robust.

2.5 Results: Comparing governmental PPP support across 20 countries

The PPP-GSI covers the three dimensions of governmental support which were derived in section 3. Table 2 presents the index scores for each of these three dimensions and for the overall index.

On the dimension *"Policy and political commitment toward PPP projects"* the index score is highest in the UK, Germany, the Netherlands (score 3.7) and Belgium-Flanders (score 3.0). Modest levels of commitment (scores between 2.0 and 2.9) are observed in Switzerland, Denmark, Greece, Portugal, Slovenia and Italy, while in the other countries – which comprise half of the sample – the level of policy and political commitment is weak (score below 2.0). Significant general PPP policy frameworks exist in Belgium, Switzerland, the Czech Republic, Denmark, the Netherlands, the UK, and Germany, and significant general PPP programmes exist in Greece, the Netherlands, the UK and Germany. High levels of political support over time are observed in Belgium-Flanders, Italy, Portugal, Germany and the Netherlands. In the UK political support for PPP has decreased in recent years but is still high in comparison with most other countries.[8] Only the Netherlands, the UK and Germany score high (above 3.0) on all three indicators of the dimension 'policy and political commitment', while Austria, Estonia, France, Serbia, Slovenia, Sweden, Cyprus and Finland score low (2.0 or lower) on all three indicators. In Switzerland – and to a lesser degree in the Czech Republic – a general PPP policy framework has been developed, but there is neither a PPP programme nor is there political support for PPPs. In contrast, in Greece there is no general PPP policy framework and political support of PPPs is only modest, but a significant PPP programme exists.

On the dimension "*Legal and regulatory framework*", Table 4 shows that variation of scores is low, because countries' legal systems usually treat PPP as a type of contract which is covered by national

[7] An exception is Belgium where nearly no PPP activity takes place outside Flanders. Flanders exports its expertise and regulatory frameworks to the federal level and other regions, which is different from other federal countries like Germany and Austria, where national government still takes the lead. Data for Flanders will be used as a proxy for Belgium because most mobility policies are exclusive competences of the regional governments and autonomy and financial independence of regional governments is particularly strong.

[8] After a reassessment of the PFI/PPP programme in 2012 a new PPP version was launched which aims to make the government a co-investor in PPP infrastructure projects.

civil law; moreover, all countries in the sample comply with EU standards of public procurement which reduces variation. The EU directives on public procurement indeed act as coercive isomorphic pressure (see section 2). Countries that have drafted a specific PPP or concession law are France, Greece, Portugal and Serbia. The Czech Republic, Cyprus and Italy have provided quite comprehensive legal frameworks, stipulating procedures and criteria for selection of private partners, non-competitive procedures in exceptional circumstances, review procedures, contract termination events, compensation provision and provision for collection of fees or payment by government. The low score of the UK might be attributed to its legal system, which is based on common law. PPPs or Private Finance Initiative (PFI) are regulated within the general public procurement legal framework with no specific PPP or concession law available. Other regulations, such as procedures for unsolicited proposals, contract termination, compensation and payment collection are not regulated by law but in various documents without legal status issued by the HM Treasury. Probably least well-developed is the legislative and regulation framework in Denmark and Estonia. In Denmark there is no specific procurement PPP law covering all sectors, but Danish building legislation was changed at the national level in 2004 to include a requirement that all construction projects carried out by central government agencies must consider the PPP route.

Table 3: PPP-GSI for 20 European countries

Country		PPP-GSI dimensions			Overall PPP-GSI score
		Policy and political commitment	Legal and regulatory framework	PPP-supporting arrangements	
AT	Austria	1.0	1.8	1.5	1.4
BE	Belgium-Flanders	3.0	1.8	2.8	2.5
CH	Switzerland	2.3	1.8	1.8	2.0
CZ	Czech Republic	1.7	2.3	2.1	2.0
DK	Denmark	2.3	1.0	1.8	1.7
EE	Estonia	1.0	1.3	1.3	1.2
FR	France	1.3	2.8	3.1	2.4
GR	Greece	2.3	2.8	2.3	2.5
IT	Italy	2.0	2.3	2.3	2.2
NL	The Netherlands	3.7	1.8	3.3	2.9
PT	Portugal	2.0	2.8	2.8	2.5
RS	Serbia	1.3	2.5	2.0	1.9
SI	Slovenia	1.3	2.3	2.2	1.9
SE	Sweden	1.0	1.8	1.2	1.3
UK	United Kingdom	3.7	1.8	3.6	3.0
CY	Cyprus	1.7	2.3	1.8	1.9
FL	Finland	1.3	1.8	1.3	1.5
SL	Slovak Republic	2.0	1.8	1.9	1.9
DE	Germany	3.7	1.8	3.4	2.9
HU	Hungary	1.7	1.8	2.2	1.9

On the dimension "*PPP supporting arrangements*", variation among the 20 countries in the index is high. Four countries (France, the Netherlands, Germany and the UK) have quite extensively developed PPP support arrangements (score 3.0 or higher). The largest and most commercially driven one among all PPP support units globally was "Partnership UK", which was a joint venture between HM Treasury and private actors with approximately 75 employees at its peak; since its closure in 2011 two other PPP units have existed. Portugal and Belgium/Flanders score high on two

of three variables which capture the dimension "PPP-supporting arrangements". Eight countries score below 2.0, reflecting weak or non-existent PPP support organisations. In Austria a 'PPP competence centre' was established in 2007 and "suspended" (in effect abandoned) already in 2008 after a political shift at the national level and during the financial market crisis. In Denmark, a PPP knowledge centre with limited resources was established at the central government level in 2004 but closed down in 2009 because its finance ran out; a 'PPP contact point' was re-launched in 2010. In Sweden, Finland and Estonia, no dedicated PPP unit has been in operation and other supporting arrangements have been mainly absent, resulting in the lowest scores on this dimension.

When calculating the *overall PPP-GSI score* of the twenty countries, we find in Table 3 the highest value for the UK (score: 3.0). The Netherlands, Germany, Belgium-Flanders, Greece and Portugal have a PPP-GSI score between 2.5 and 2.9. Three countries have a score between 2 and 2.4: France, Italy and the Czech Republic, while Austria, Denmark, Estonia, Serbia, Slovenia, Cyprus, Finland, Slovakia, Hungary and Sweden score below 2.0. These four groups of countries with different levels of governmental support do not seem to match with the usually distinguished country clusters based on geography or politico-administrative culture (e.g. Latin, continental and CEE countries). The only exception seems to be that the Nordic countries in our sample are all listed in the group with PPP-GSI values below 2.0. A robustness test through cluster analysis supports this categorisation.

The results indicate, firstly, that the different governmental support activities for PPPs do not necessarily come in a package. Some countries such as the UK, the Netherlands, Germany and Belgium-Flanders score high on the policy and political support variable without necessarily scoring high on the other variables. A group of countries including Sweden, Estonia, Finland and Austria score relatively low on all three dimensions (less than 2.0) indicating that governmental support towards PPPs is rather limited in these countries. A broad range of countries including Switzerland, the Czech Republic, France, and Italy seem to have launched moderate governmental institutional support of PPPs. France, despite its long tradition of concessions, scores high on legal and supporting arrangements, but less on explicit PPP policy documents.

Secondly, the highest variation between countries is on the policy dimension and on PPP-supporting arrangements, but much less so on the regulatory dimension, because of the coercive harmonising influence of the EU-procurement regulations.

Thirdly, the policy dimension and the dimension of the PPP-supporting arrangements tend to be positively related. Governments with an explicit policy framework, a PPP programme and a strong political commitment for PPP will in most cases also have more elaborate supporting arrangements (e.g. Belgium, the Netherlands and the UK) compared to those which lack clear policies and political commitment (e.g. Czech Republic and Sweden). More surprisingly, the PPP-GSI shows that governments which have explicit policies and political commitments on PPPs do not necessarily have elaborate legal frameworks with which to foster them. The indicative conclusion is that the link between explicit policies and dedicated supporting arrangements on the one hand and legislative frameworks on the other in our sample of 20 European countries seems to be loose.

2.6 Does government support for PPPs matter? Exploring the link between the PPP Governmental Support Index and PPP uptake

The PPP-GSI has shown that governments do invest in governmental support for PPPs, but to different extents. A captivating question arising from this observation is whether governmental support matters: do countries in which governmental support for PPPs is extensive have a larger

take-up of infrastructure/transport PPP projects, compared to those with low investments in governmental support for PPPs? Much academic literature and practitioner-oriented documents make this assumption. We perform an explorative analysis to examine the covariance between the extent (and kind) of governmental support for PPPs in a country and the extent of PPP activities in that country. These analyses are meant to set the scene for further research. However, they come with the caveat commonly acknowledged among PPP researchers that there is a lack of encompassing comparative data on PPP activity (in terms of number of projects, volume and share of investments) across countries and over time.

We aimed to use sources which provide data over time in terms of numbers and volume of PPP projects, and which do not restrict their inventory of projects to those which are EIB-funded. The market update from EPEC from 2010 until 2012 (EPEC 2011b, 2012, 2013) is the only publicly available source which delivers such data. As the PPP activity data cover a shorter time span than the PPP-GSI index we build the link we explore applies to recent PPP activity, whereas for example activities in the 1990s are not captured by this analysis. A further caveat is that the focus of EPEC reports is mainly on national PPP projects, whereas local projects are not counted systematically; also EPEC only provides data on 11 countries of our original sample. Nevertheless, for Europe the EPEC data seem to be the most systematic source, and hence we use it, while being aware of their limitations and of the subsequent preliminary nature of our analyses.

We compare the PPP-GSI and its sub-indices with the take-up of PPP projects at country level in terms of closed projects[9] (the number and volume of PPPs projects) during the period from 2010 to 2012. Table 4 illustrates the absolute number and volume of closed PPP deals (in million Euros) as well as the volume of closed PPP compared to total GDP across 11 European countries during the period from 2010 to 2012, based on (incomplete) data from EPEC. EPEC data deals with projects with the following features: (1) PPP transactions of DBFO or DBFM or concession arrangements which feature a construction element, the process of public service and a genuine risk-sharing between the public and the private sector; (2) transactions financed through 'project financing' and which reached their financial close in 2010- 2012; and (3) transactions for a value of at least €10 million.

Table 4: Linking the PPP-GSI with EPEC PPP activity data

Country		PPP-GSI score	PPP Market update (EPEC)**				PPP Market update (EPEC) (million euro)				PPP as % of GDP
			2010	2011	2012	TOTAL	2010**)	2011**)	2012**)	TOTAL	
BE	Belgium	2.5	5	6	3	14	1,700	700	300	2,700	0.24
CZ	Czech Republic	2.0	4			4	150	-	-	150	0.03
DK	Denmark	1.7	1	3		4	200	50	-	250	0.03
FR	France	2.4	19	19	22	60	1,800	11,100	3,900	16,800	0.27
IT	Italy	2.2	2	3	1	6	400	800	250	1,450	0.03
NL	The Netherlands	2.9	3	1	3	7	1,000	25	900	1,925	0.10
PT	Portugal	2.5	3		1	4	3,150	-	25	3,175	0.60
SE	Sweden	1.3	1			1	1,100	-		1,100	0.09
UK	United Kingdom	3.0	44	27	26	97	3,850	3,200	5,750	12,800	0.22
DE	Germany	2.9	14	16	6	36	400	1,200	200	1,800	0.02
FI	Finland	1.5		1		1		300		300	0.05

Sources: **) PPP Market update (EPEC)

[9] We do not consider projects in tender or in negotiation.

As seen from Table 4, in the UK the high PPP-GSI score corresponds with 97 closed PPP deals in 2010-2012. The volume of closed PPP deals in the UK amounts to 0.22% of GDP, which is higher than in most countries, but lower than in Belgium, France and Portugal (countries with a score of less than 3 on the PPP-GSI). While the Private Finance Initiative (PFI) had started in the UK with in the late 1980s in the period 2010 – 2012, political scepticism about the PFI strategy had risen and the financial crisis impacted upon the number and volume of closed PPP projects (van den Hurk & Liyanage, 2013).

The Netherlands, Germany, Belgium-Flanders, and Portugal have a PPP-GSI score of between 2.5 and 2.9. The Dutch government introduced PPP projects as a concept imported from the UK and, it launched two projects (Wijkertunnel and Noordtunnel) in 1989 (Dewulf & Castaño, 2013); the elaborate governmental support notwithstanding, only 7 projects were closed in 2010 to 2012 accounting for 0.10% of GDP (this is approximately the same level as Sweden which has a considerably lower PPP-GSI score).

Germany started launching PPPs in the early 2000s (Möpert & Witz, 2013) and implemented 36 PPP projects from 2010 to 2012 which accounted for 0.02% of German GDP. In Belgium/Flanders a PPP decree was accepted in 2003, and govermental support gained momentum in 2004 after a change in government (van den Hurk & Verhoest, 2013; Van den Hurk & Verhoest 2015; Van Gestel et al. 2014). During the 2010 to 2012 period 14 PPP projects were closed with an average volume of 0.24% of GDP. In Portugal concession contracts have been used in transport infrastructure delivery since the early 1990s in the railway sector; the first PPP-specific legislation was adopted in 2003 (Macario & Ribeiro, 2013). While there were many projects closed before 2010, it was only 4 projects in the 2010 to 2012 period, which amounted up to 0.60% of GDP.

France, Italy and the Czech Republic have a PPP-GSI score of between 2 and 2.4. France closed 60 projects from 2010 to 2012, which amount to of 0.27% of GDP. While it has used concessions for constructing the large majority of its motorways since the 1950s, modern forms of PPP like the public service delegation (PSD, 1993) were introduced and partnership contract (PC, 2004) were introduced later (Bonnet & Chomat, 2013). Italy only achieved 6 PPP projects during the period 2010 to 2012, its value being equivalent to 0.03% of GDP. Also in the Czech Republic, where PPP as a tool to intensify investment in infrastructure was welcomed by the Social Democratic government in 2004 (Witz, 2013), but overall governmental support and PPP activity remained very modest.

Finally, Denmark, Finland and Sweden have a PPP-GSI below 2.0. In Denmark, the concept of PPP was formally introduced by the Danish Ministry of Finance in 1999 (Petersen, 2013), but activity remained rather low; in 2010 to 2012 the average volume of closed projects was 0.03% of GDP. Finland first adopted PPP as a means with which to address the capital investment gap in the 1990s (Leviakangas, 2013); it recorded only one PPP project during 2010 to 2012, accounting for 0.05% of GDP. Sweden only accounted for one large closed PPP project during 2010 to 2012 (which amounted to 0.09% of this period's GDP), reflecting its limited experience of using PPP as a government procurement scheme or as a collaboration model in the infrastructure sector (Ågren & Olander, 2013).

In summary, according to EPEC data Portugal, France, Belgium-Flanders and the UK are the countries with the highest value of closed PPP projects in relation to GDP during the period 2010

to 2012 representing 0.20% of GDP or more. Interestingly, these countries are characterised by a PPP-enhancing institutional environment reflected by high scores on the PPP-GSI in the range between 2.4 and 3.0. Portugal implemented PPP projects representing almost 1.75% of GDP in 2010, but activity declined in the following years due to the financial crisis. The highest value of PPP projects in relation to GDP in a single year was 0.54% in France (in 2011) and 0.28% in the UK (in 2012). Not all countries with index scores higher than 2 have a high relative volume of PPP investments in this period: Germany and the Netherlands score 2.9 on the PPP-GSI but only record PPP-values of 0.02% and 0.10% of GDP respectively, and with Italy scoring 2.2 on the PPP-GSI, the value of PPPs amounts to only 0.03% of GDP. Countries which score low on the PPP-GSI (scores below 2.0) like Denmark, Finland and Sweden, show only a very modest uptake of PPPs relative to GDP, as was expected.

Hence, the relation between the PPP governmental support and PPP take-up seems to be positive but rather modest in strength. The statistical association between the PPP-GSI as an approximation of a country's PPP-enhancing institutional framework and the take-up of PPP is modest: the correlation coefficient between PPP-GSI and the value of PPP in relation to GDP is equal to 0.31, and the correlation coefficient between PPP-GSI and the number of projects is 0.58. When interpreting this rather modest relation, one has to take into account the limitations of this preliminary test, working with incomplete EPEC data for only three years. For example, in the cases of Germany and Italy, EPEC data – which captures PPP activity only at the central state level – might systematically understate PPP activity because a significant amount of it is taking place at the sub-national levels.

2.7 Conclusions

This chapter makes several contributions to theoretical and empirical literature, as well as insights to PPP policy makers, but also opens venues for further research, which we list in this section. Our first aim was to provide a comparative overview of key elements of the PPP institutional frameworks across 20 different countries by developing an index of governmental support. The starting point is that there is normative pressure by international organisations and consultants on national governments to create appropriate formal institutions to enhance PPP development. The formal institutions aiming at enhancing legitimacy, trust and capacity which are under control of government, as listed in institutional literature (Mastos-Castaño et al., 2014), were taken as core elements in the PPP-GSI index. These elements are clear PPP policy strategies, programmes and sustained explicit political support, an appropriate legislative and regulatory framework, and a range of PPP-supporting arrangements. The operationalization of these dimensions was based on normative documents issued by these international organisations. The index also aims to provide some dynamic perspective as it tries to grasp the evolution of some elements over time (such as the evolution of political support). In academic literature such a comparative index was so far lacking.

Compared to other indices measuring a PPP-enhancing context, the Government Support Index (PPP-GSI) differs in depth and in scope. It is much more encompassing than other indices when it comes to the supporting role governments can take for PPPs. But it does not include macro-economic or macro-financial features of a country, which are not specifically linked to PPPs and only partially to be influenced by national governments.

Another contribution is that, despite international normative (and coercive) pressures, our analysis distinguishes different groups of countries with different levels of governmental support, as we would expect based on the transformative perspective. European countries differ substantially in terms of policies and PPP-supporting institutions, but there is less variation in terms of legislative and regulative frameworks due to the coercive harmonising influence of the EU-procurement regulation. Moreover, governments which have explicit policies and political support for PPP development will invest in elaborate supporting arrangements, but not necessarily in PPP-specific legislation and regulations.

Based on the transformative perspective, one would expect that these differences in governmental support are caused by the mediating effect of country-specific macro-institutional and macro-economic factors. Hence, these broader features of a country should be taken into account when explaining and contextualising government support actions. A possible pathway for this endeavour would be to examine the extent to which government policies, regulations and supporting arrangements are more elaborate in countries with specific administrative traditions (Painter & Pierre, 2010). Countries with Anglo-American and Scandinavian administrative traditions, in comparison with those with Napoleonic and Germanic administrative traditions, have taken up New Public Management (NPM)-inspired reforms earlier and to a more pronounced degree (Pollitt & Bouckaert, 2011). Similarly, research in public management has found that countries with certain societal cultures are more prone to initiate and sustain reforms in public service delivery (Bouckaert 2007; Verhoest 2010).

However, the clustering of countries in this article indicates that the link between the politico-administrative traditions of countries with their governmental support for PPPs is certainly not straightforward. So, future research should focus on the effect of *specific combinations* of macro-institutional factors, like polity, culture, and administrative reform tradition on PPP governmental support. Macro-economic and financial features should be included in such analyses, too. Do countries with a higher governmental debt rate or economic growth invest more in a strong governmental support for PPP development? Further research is needed, but preliminary analyses by the authors suggest a positive link between for example high levels of government debt and governmental support for PPPs.

A third contribution of the article is linked to the underlying assumption in academic institutional literature and practitioner-oriented literature stating that PPP-enabling institutions matter for PPP development. Based on the limited amount of comparable data in terms of PPP take-up available at the moment, our analyses suggest the extent of government support for PPP, as measured by the PPP-GSI, has a positive link with the extent of PPP take-up in a country, but that link is certainly not straightforward. Low levels of governmental support seem indeed to relate to relatively weak PPP activity. However, not all countries with high levels of governmental support have high PPP activity rates in the studied period from 2010 to 2012. In countries in which PPPs are strongly supported by government institutions, policies and legal frameworks, the actual take-up of it might be quite low, like in the Netherlands.

However, these explorative results might suggest that governmental support may be a *necessary* but not *sufficient* factor to explain PPP activity in a country. Of course, many other factors may affect the actual take-up of PPPs in the period under review. One element is that formal institutions may be adopted for reasons of window-dressing and appropriateness, having no effect on actual

attitudes and real-life processes. In institutional terms, actors may adopt reforms to legitimise themselves, but 'decouple' these reforms from their actual decision making behaviour (Meyer & Rowan 1977; Powell & Di Maggio 1983). Indeed, limitations in our analyses could account for some of these findings. First, a major cause of several countries with highly developed governmental support showing rather weak PPP activity in that period is most probably the financial-economic crisis from 2008 and its consequences for the macro-economic situation, as well as the investment climate in these countries (see e.g. Greece and Italy). Moreover, another factor is the amount of PPP activity in the period before 2010 which results in different starting positions for the period from 2010 to 2012. Hence, governmental support is only one factor in a complex interplay of different causes, and not all elements of governmental support seem to be equally important. Moreover, in future studies it might be necessary to look in a more nuanced way to specific elements of PPP governmental support. For example, it is striking that countries with more extensive governmental support, like the UK and the Netherlands, move from a central PPP unit to decentralised units situated in line ministries. Maybe a central PPP unit is more functional in the early years of PPPs in a country, i.e. essentially as a policy promoter. But as countries become more PPP mature, they move from policy promotion to PPP implementation and operation which requires much more competencies in line departments. However, this reasoning might not apply to the same extent to the Netherlands as to the UK, since the Netherlands actually has quite few PPP projects in spite of long policy appraisal.

Also further PPP research should also explore informal institutional aspects linked to national administrative cultures and their influence on uptake of PPPs in different countries. Future PPP research should also examine how institutional PPP support at supra-national and sub-national levels jointly establishes a multi-level governance framework for PPP activity at both national, supra-national and sub-national levels of government. Moreover, the private institutional support relating to banking, credit systems and private consultancy competencies also represents an important component of the institutional PPP support systems in the countries. Scrutinising the private sector's contribution to the institutional support of PPPs is thus highly relevant as well, although it has been outside the scope of this article. Finally, in terms of understanding how institutional PPP support systems potentially link with PPP performance, it would be highly relevant to conduct analyses that link institutional PPP support with data concerning value creation for stakeholders in the society.

Chapter 3

Diverging or converging PPP policies, regulations and supporting arrangements? A comparative analysis of 20 European countries

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3.1 Introduction

Public-private partnerships (PPPs) have been launched in most countries in the Western world as a means of developing large-scale infrastructure projects (Grimsey & Lewis 2002; Hodge & Greve 2007; Jooste, Levitt & Scott 2011). The introduction of new partnership forms has been seen as part of a broader trend towards network forms of governance and multi-actor collaboration based on shared risks, competencies and benefits between governments and private companies (Klijn & Teisman 2003; Osborne 2010). The notion of PPP has been subject to global interest and has been characterised as "a very-fashionable concept" (Wettenhal 2003: 77) and a model that enjoys "international acceptance" (Johnston & Gudergan 2007: 570). However, recent comparative research also indicates that the initiatives that governments have launched to promote PPPs differ considerably across countries with the result that significant differences in PPP supportive institutional frameworks now exist (Petersen 2011; van den Hurk et al. 2015). Within the global trend of convergence in positive PPP rhetoric there are thus clear indications of widespread divergence in governments' policy, regulatory and institutional support arrangements for PPPs across otherwise largely similar countries in the Western world (Hammerschmid & Angerer 2005; Verhoest et al. 2015).

In this chapter, we comparatively examine some of these differences in countries' PPP support by comparing the extent to which national governments have launched policies, regulations and dedicated support institutions to support the development of infrastructure PPPs. The objective is to examine differences and similarities in governmental support of PPPs and to cluster countries according to the ways in which they support PPPs through the launch of policies, regulations and institutional units dedicated towards supporting the development of PPPs. We build upon standardized data gathered by the country teams involved in the COST Action TU 1001 'PPPs in Transport: Trends and Theory' which cover 20 European countries. We address the following descriptive-comparative research questions: How do different European countries compare in terms of their governmental support towards PPPs? With which other European countries do they cluster with regard to the development of policies and political support of PPP, legal and regulatory frameworks and supporting arrangements for PPPs? These research questions are central in this chapter, in which we report the results of a comparative mapping of PPP policies, regulations and supporting arrangements in 20 European countries.

The remainder of the chapter is structured as follows. First, we outline and discuss the elements of governmental PPP support as defined by policy, regulatory and institutional support. Next, we present the methods used to classify and index the countries and consider strengths and weaknesses of differing clustering methods. Then, we present the results of the cluster analysis and outline some of the main characteristics of the four clusters of countries. In the penultimate section, we provide a more in-depth discussion of differences and similarities between countries in their PPP policies, regulations and supporting arrangements. Finally, we provide a conclusion to the chapter and provide some suggestions for further comparative PPP research.

3.2 How governments can support PPPs: A framework and methodology

Academic literature (see e.g. Delhi, Palukuri, & Mahalingam 2010; Meunier & Guinet 2010; Galilea & Medda 2010; Jooste, Levitt & Scott 2011; Mu, de Jong, & Heuvelhof 2010; Matos-Castaño et al. 2014) suggests that the national institutional and political contexts are important determinants of the use of PPP as a mode of infrastructure delivery. Practitioner-oriented literature in the field of

PPP (see e.g. Deloitte 2007; EIB 2011; Economist Intelligence Unit 2011; EBRD 2012; EPEC 2011a; OECD 2008; UNESCAP 2005; World Bank & PPIAF 2006) elaborates on this by defining relevant components of such contexts. In this chapter we focus on three main dimensions of government support of PPP which are considered important both in academic and in practitioner literature as being important formal institutions which may be supportive for creating a PPP enabling field (Jooste et al. 2011): policy design and expression of political commitment, legal and regulatory framework, and existence and effectiveness of supporting arrangements.

Guidelines for governments for establishing such a PPP-enabling field have been specified in practitioner-oriented literature produced by international organizations and consultancy firms. We found four measurement methods and corresponding indices on 'PPP-readiness' (UNESCAP 2005; Economist Intelligence Unit 2011), 'PPP maturity level' (Deloitte 2007) and 'quality of PPP legislation' (EBRD 2012). These four indices, on the one hand, combine qualitatively different aspects but none of them provide an index that covers all aspects of governmental support regarding PPPs, being policy commitment, regulatory measures and PPP supporting arrangements. On the other hand, these four indexes also include aspects, which are not or only very indirectly under the control of governments like macroeconomic conditions and the general investment climate.

Therefore, we built a framework that captures governmental support for infrastructure PPPs, which solely focuses on PPP-specific factors and on the role of government actions to enable and stimulate PPP. We deliberately do not include macro-financial or macro-economic factors in this framework because this would conflate the actual role of government. These other factors, of course, should be taken into account when explaining and contextualizing government support actions and will be examined in future research.

Table 6 gives an overview of the operationalization of the three dimensions of government support for PPP. Each dimension of government support is captured by two or three indicators which in turn comprise up to four sub-indicators. Explicit PPP policies and long term political commitment are crucial to create legitimacy for PPP to become an accepted instrument of public investment policy (Matos-Castaño et al. 2014). This first dimension is captured with the following indicators: existence of relevant strategy documents and programs; an adequate legal and regulatory framework for PPP – both "hard" and "soft" regulations are relevant (see Mörth 2007; Petersen 2010; Bovis 2013) – can facilitate the uptake of PPPs. The second dimension is captured by two indicators: existence and contents of a specific PPP law, and adequacy of the general legal framework for the uptake of PPP. Finally, PPP-supporting arrangements which can exert a major influence on shaping a PPP enabling field (Jooste et al. 2011; Mahalingam et al. 2011) are captured by three indicators and the respective sub-indicators: the existence and characteristics of PPP supporting units; the existence, use, and type of procedures for project appraisal and prioritization; and the use of standardized processes and documents for PPPs in transport. Most (sub-) indicators are of a static nature and reflect the situation at a given point in time (timeframe of data collection Spring 2013), although a few (sub-) indicators such as policy political support and indicators concerning PPP-units capture evolutions over time.

We applied the framework for governmental support for PPPs to a sample of 20 European countries (see next section) which are characterized by a considerable variety of experience with PPP and by different politico-administrative traditions and regimes including Nordic, Continental, Napoleonic-Latin, Central and East European countries, and UK as an Anglo-American country (see Painter &

Peters 2010). Eighteen of these countries are member states of the European Union, one country is closely affiliated to the EU (Switzerland), and one country has a legal framework which is consistent with EU-regulations in the field of PPP (Serbia); therefore, a harmonizing effect on the legal and regulatory framework can be expected.

Country data were collected within the COST TU1001 Action on PPP in transport, which also provided the organizational frame for developing the indicators. For reasons of data availability, data, generally, refer to the central government level with the exception of Belgium where Flanders is taken as a proxy because in Belgium there is nearly no PPP activity outside Flanders. In order to warrant validity and reliability, data were collected by country experts with in-depth contextual knowledge about national institutions and practices. Based on selected interviews and the analysis of legislation and other documents country teams delivered a narrative country profile (see Verhoest et al. 2013) and a set of data in accordance with the dimensions and indicators listed in Table 5. Members of country teams were integrated into the process of developing the set of indicators and were provided with detailed guidelines explaining all items in order to reduce the risk of variation in data collection and misreporting. In a feedback loop with the authors of this paper completeness and consistency of data delivered by country teams was checked. In order to avoid a potential bias due to interpersonal differences in interpretation data coding was done independently by three persons and subsequently discussed among the authors. This demanding process yielded indicators for 20 countries. However, due to limitations in availability of country teams in specific countries, we were not able to include a few important PPP countries like Ireland, Spain and Poland.

Data was exploited in two ways: first, a PPP-Government Support Index (PPP-GSI) will be presented as it was developed in Verhoest et al. (2015). Item scores of the PPP-GSI are measured on an ordinal scale between 1 and 4 (see table 5, second column) with 4 representing strongest and 1 representing weakest or no government support for PPP. The PPP-GSI can be conceived as consisting of three sub-indexes which cover one of the three dimensions each: A sub-index on policy and political support, a sub-index on the legal and regulatory framework, and a sub-index on PPP-supporting arrangements. The value of the overall PPP-GSI therefore is equal to the mean of its sub-indexes. Dimensions, indicators within each dimension, and sub-indicators within each indicator are given equal weights because neither theoretical considerations nor measurement problems support the allocation of different weights to the different dimensions, indicators and sub-indicators of governmental support for PPP. The method of simple weighting and calculating averages might, however, have properties which may cause some misrepresentations of actual government support profiles of countries and the resulting ranking of countries with regard to PPP government support.

In order to avoid these misrepresentations, we will apply a second approach for exploiting the dataset collected with the framework presented in table 5, based on cluster analysis (CA). CA enables us to check for the robustness of the country ranking resulting from the calculation of the PPP-GSI values and to test the meaningfulness of these results for further analyses. It will be used to explore the country data set in order to assess whether countries can be grouped meaningfully in terms of a relatively small number of groups or ‘clusters’ of countries which resemble each other and which differ in some respects from countries in other clusters (Everitt et al. 2011). We apply hierarchical clustering with agglomerative methods to specify such clusters among the 20 countries included using Statistical Package for Social Sciences (SPSS). Agglomerative methods are widely used hierarchical methods yielding a pattern of distinct clusters and successively merging clusters

Table 5: A framework for measuring governmental support for PPP

Dimensions	*Indicators*	*Sub-Indicators*	*Score*			
			4	3	2	1
Policy and political commitment	Existence of a strategy document of PPP policy (Pol_1)		Yes, published before 2006 and updated afterwards	Yes, published before 2006, but not updated	Yes, recently published and not updated	Non-existent
	Existence of a general PPP programme (Pol_2)		Yes, incl. transport-specific programme, clear time schedule	Yes, incl. transport-specific programme, but no clear time schedule	Yes, but only general PPP programme, no clear schedule	Non-existent
	Political support (Pol_1)		Rather strong, stable or increasing	Rather strong, decreasing	Rather low, increasing	Rather low, stable or decreasing
Legal and regulatory framework	Specific PPP or concession law: (a) existence (Legal_1)	(1) General PPP or concession law; (2) PPP law in transport; (3) procurement law; (4) in-line with EU	All four criteria are met	Three criteria are met	Two criteria are met	One or no criterion is met
	Specific PPP or concession law: (b) scope regarding definitions of four items (Legal_2)	definition of (1) PPP; (2) eligible sectors and types of infrastructures/ services; (3) contracting authorities; (4) eligible private party	All four criteria are met	Three criteria are met	Two criteria are met	One or no criterion is met
	Elements provided in the general legal framework (including public procurement law) (Legal_3)	4 sub-indicators covering procedures and recommendations, 5 sub-indicators about mandatory provisions in PPP contract[10]	8 to 9 sub-indicators are met	6 to 7 sub-indicators are met	4 to 5 sub-indicators are met	0 to 3 sub-indicators are met

[10] Does the prevailing legislation include provisions and procedures regarding the following elements: selection of private partner through competitive procedures; non-competitive procedure in exceptional circumstances; procedures for unsolicited proposals; review procedures; contract termination events; compensation provisions; provisions for collection of fees or payments by government; public authorities to support and provide guarantees and step-in rights for lenders or substitution by a new private partner?

PPP-supporting arrangements	Acting public institutions/PPP-supporting units (Arr_1)	Existence of a PPP support unit	Yes, since before 2006	Yes, since 2006 or later	No, not anymore	No, never existed
		Legal and organisational basis of PPP support unit	Private legal body with private sector participation	Private legal body without private sector participation	Public (law) body under ministry	Non- existent
		General functions PPP Support unit	Dissemination, policy function and green lighting	Dissemination and policy guidance or green lighting	Dissemination only	Non-existent
		Staff size of unit	20 or more	5 to 20	< 5	Never existed
	Procedures for project appraisal and prioritisation, role of main sectors in project stages (Arr_2)	Existence of standard ex ante evaluation instruments	Mandatory for all projects	Mandatory beyond threshold	Existing, but not mandatory	Non-existent
		Use of standard ex-ante evaluation in PPP projects	Used in all projects	Used in majority of projects	Used in minority of projects	Not used
		Existence of a third party scrutinizing and approving PPP projects before project on tender	Yes	Yes, beyond certain threshold	No, not anymore	Not at all
		Existence of a third party scrutinising and approving PPP projects before final contract signed	Yes	Yes, beyond certain threshold	No, not anymore	Not at all
	Standardised processes and documents for PPPs in transport (Arr_3)	Use of standardised contracts for PPP in transport	Used in majority of projects	Used in minority of projects	Existent but not used	Non-existent
		Use of standardised PPP model in transport	Used in majority of projects	Used in minority of projects	Existent but not used	Non-existent

Source: Verhoest et al. (2015)

together until a stopping criterion is satisfied (Everitt et al. 2011; Abonyi & Feil 2007). The result of such an analysis is a two-dimensional diagram (dendrogram), which represents the fusions or divisions made at each stage of the analysis.

Six variants of agglomerative cluster analysis methods are available for finding similarities and dissimilarities among countries: single linkage, complete linkage, average linkage, centroid, median and Ward's method. Single linkage was introduced by Florek et.al (1951), Sneath (1957) and Johnson (1967) and considers the distance between groups defined as that of the closest pair of countries, where only pairs consisting of one country from each group are considered. The complete linkage method (also called furthest neighbor method) defines distance between groups as that of the most distant pair of countries. The average linkage method defines distance between two clusters as the average of distance between all pairs of countries from each group. The centroid clustering method uses the data matrix rather than a proximity matrix and involves merging clusters with the most similar mean vector. The median linkage method is similar, but the centroids of the constituent country clusters are weighted equally to produce the new centroid of the merged cluster. Finally, Ward (1963) introduced a method in which the fusion of two clusters is based on the size of an error sum of squares criterion (Everitt et.al 2011).

However, it has to be recognised that different hierarchical clustering methods may give very different results on the same data, and empirical studies are rarely conclusive. No method can, in general, be considered superior to the other methods, and, as Gordon (1998) points out, hierarchical methods are in any case only stepwise optimal (Everitt et.al. 2011).

As we emphasise the extent to which countries within clusters are similar we look for compact clusters. Complete linkage is the logical opposite of single linkage clustering in that the linkage rule states that any candidate for inclusion into an existing cluster must be within a certain level of similarity to all members of that cluster (Sokal & Michener 1958). Being more rigorous in clustering than single linkage, complete linkage has a tendency to find relatively compact, hyperspherical clusters composed of highly similar cases (Aldendefer & Blashfield 1984). Studies that focus on the stability of clustering in the presence of outliers or noise, include that by Hubert (1974), who found that complete linkage is less sensitive to observational errors than single linkage. Ward (1963) introduced a method, in which the fusion of two clusters is based on the size of an error sum-of-squares criterion. The objective at each stage is to minimize the increase in the total within-cluster error sum of squares, (Everitt et.al. 2011). Wards Method is also known as the within-groups sum of squares or the error sum of squares (ESS). The method works by joining those groups or cases that result in the minimum increase in the ESS. The method tends to find (or create) clusters of relatively equal sizes and shapes as hyperspheres (Aldendefer & Blashfield 1984). Ward's method performed very well when the data contained clusters with approximately the same number of points, but poorly when the clusters were of different sizes. Cunningham and Ogilvie (1972) and Blashfield (1976) also concluded that for clusters with equal numbers of points Ward's method is successful, otherwise complete linkage is preferable.

Below, we first discuss the clustering of countries when considering all three dimensions of governmental support while in the final section, we scrutinize more closely how countries cluster when looking at each of the three dimensions separately.

3.3 **Classifying countries regarding governmental support by indexation – problems and solutions**

In Verhoest et al. (2015) we rank the 20 countries under review with respect to their PPP governmental support by creating a simple composed index based on the simple summation of the different (sub) indicators. The score of this PPP Governmental Support Index (PPP GSI) ranges between 1.0 (minimum) to 4.0 (maximum). Table 2.2 reveals that the highest score of PPP-GSI is achieved by the United Kingdom (3.0), and on the other extreme of the range Estonia is to be found with the lowest score of 1.2. Table 6 presents the detailed values of this index and the sub-indexes for the different countries under review.

Table 6: PPP-GSI for 20 European Countries (Verhoest et al. 2015)

Country		*PPP-GSI dimensions*			*Overall PPP-GSI score*
		Policy and political commitment	*Legal and regulatory framework*	*PPP supporting institutions*	
AT	Austria	1,0	1,8	1,5	1,4
BE	Belgium-Flanders	3,0	1,8	2,8	2,5
CH	Switzerland	2,3	1,8	1,8	2,0
CZ	Czech Republic	1,7	2,3	2,1	2,0
DK	Denmark	2,3	1,0	1,8	1,7
EE	Estonia	1,0	1,3	1,3	1,2
FR	France	1,3	2,8	3,1	2,4
GR	Greece	2,3	2,8	2,3	2,5
IT	Italy	2,0	2,3	2,3	2,2
NL	Netherlands	3,7	1,8	3,3	2,9
PT	Portugal	2,0	2,8	2,8	2,5
RS	Serbia	1,3	2,5	2,0	1,9
SI	Slovenia	1,3	2,3	2,2	1,9
SE	Sweden	1,0	1,8	1,2	1,3
UK	United Kingdom	3,7	1,8	3,6	3,0
CY	Cyprus	1,7	2,3	1,8	1,9
FL	Finland	1,3	1,8	1,3	1,5
SL	Slovak Republic	2,0	1,8	1,9	1,9
DE	Germany	3,7	1,8	3,4	2,9
HU	Hungary	1,7	1,8	2,2	1,9

In Verhoest et al. (2015), the analysis of country ranking and how it relates to PPP take-up across countries, we identify four groups of countries based on their PPP-GSI values, by dividing the range in four equal parts:

1. Countries with a PPP-GSI value of at least 3.0: The United Kingdom is the only country in this category.
2. Countries with a PPP-GSI value between 2.5 and less than 3.0: There are four countries in this cluster, listed here in order of decreasing PPP GSI value: Netherlands, Germany (both 2.9), Belgium-Flanders, Greece, Portugal (all 2.5). It should be noted that Flanders is used in this study as a proxy of Belgium (11).

[11] In Belgium only limited PPP activity takes place outside Flanders. Flanders exports its expertise and regulatory frameworks to the federal level and other regions, which is different from other federal countries like Germany and Austria, where national government still takes the lead. Data for Flanders will be used as a proxy for Belgium because most mobility policies are

3. Countries with a PPP-GSI value between 2.0 and less than 2.5: France (2.4), Italy (2.2), Switzerland and the Czech Republic (2.0) are included in this group.
4. Countries with a PPP-GSI value less than 2.0: in this group we find a large group of countries, being Serbia, Slovenia, Sweden, Cyprus, Slovak Republic and Hungary (all value 1.9), Denmark (1.7), Finland (1.5), Austria (1.4), Sweden (1.3) and Estonia (1.2).

However, one might find this clustering based on the PPP-GSI scores debatable, as there are at least three methodological properties of the method to be discussed. First, the delineation of the four clusters defined above, based on PPP-GSI scores seems very arbitrary, and redefining the boundary values of the clusters would deliver different groupings.

Second, the scaling of the indicators and sub-indicators that the PPP-GSI is composed of might distort results. While the (sub-) indicators are measured on an ordinal scale (1 to 4), calculating the arithmetic mean for each country might be considered as transforming the values from an ordinal scale to a nominal one.

Third, the PPP GSI is based on the calculation of simple averages of the indicators representing the different dimensions, which in turn are calculated based on simple summation of the sub-indicators without any weighting applied. This method of calculation may obscure substantial differences in government support profiles between countries, because countries that score very high on one dimension might have the same overall score as countries that have moderate scores on all three dimensions. Therefore a correlation analysis between (sub-) indicators of the PPP-GSI using Spearman correlation[12] was conducted. Table 7 shows the correlation between nine indicators of the PPP-GSI: three indicators representing the dimension 'policy and political commitment'[13], three representing the dimension 'legal and regulatory framework'[14]; and three representing the dimension 'PPP supporting arrangements'[15].

Policy and political commitment indicators are significantly related with indicators representing the PPP supporting arrangements dimension (p value < 0.05), with political support for PPP (Pol_3) correlating simultaneously with all sub indicators of PPP supporting arrangements (Arr_1, Arr_2 and Arr_3). While there is no significant correlation with political commitment indicators, some legal and regulatory framework indicators correlate with the PPP supporting arrangements dimension, particularly between Acting PPP Units (Arr_1) and existing PPP Laws (Legal_1) and Scope of PPP Laws (Legal_2). As correlation exists only between some pairs of indicators a relatively high score on the overall index might go together with low scores on specific indicators and dimensions. Thus, clustering by indexation might group together countries, which are very different in the way and the extent they support PPPs by policies, regulations and supporting arrangements. For example, the United Kingdom (which scores highest on the PPP-GSI) has a less extensively elaborated legal and regulatory framework, while France (which also scores high on the PPP-GSI) tends to concentrate its supporting effectors more on building an extensive legal and regulatory framework rather than on framing clear PPP strategy documents and programs.

exclusive competences of the regional governments and autonomy and financial independence of regional governments is particularly strong.

[12] In this case, Spearman correlation is applied, because it does not generally require normality.

[13] This variables included: PPP strategic documents (Pol_1), PPP program (Pol_2) and Political support (Pol_3)

[14] Variable legal & regulatory framework embraces: existing PPP Laws (Legal_1), Scope PPP Laws (Legal_2) and Element PPP Laws (Legal_3)

[15] This covers: Acting PPP Units (Arr_1), Procedures of project appraisal (Arr_2) and Standardized processes & documents (Arr_3).

Table 7: Correlation of indicators of governmental support (Spearman Correlation)

		Pol_1	*Pol_2*	*Pol_3*	*Legal_1*	*Legal_2*	*Legal_3*	*Arr_1*	*Arr_2*	*Arr_3*
Pol_1	Correlation	1.000	0.394	0.321	-0.373	-0.365	-0.154	0.301	0.038	0.545*
	Sig. (2-tailed)		0.086	0.167	0.106	0.114	0.518	0.197	0.872	0.013
Pol_2	Correlation	0.394	1.000	0.250	-0.089	-0.006	-0.128	0.420	0.270	0.505*
	Sig. (2-tailed)	0.086		0.288	0.710	0.980	0.590	0.066	0.249	0.023
Pol_3	Correlation	0.321	0.250	1.000	0.165	0.196	0.000	0.655**	0.514*	0.593**
	Sig. (2-tailed)	0.167	0.288		0.486	0.408	1.000	0.002	0.020	0.006
Legal_1	Correlation	-0.373	-0.089	0.165	1.000	0.925**	-0.038	0.452*	0.406	0.133
	Sig. (2-tailed)	0.106	0.710	0.486		0.000	0.875	0.045	0.076	0.577
Legal_2	Correlation	-0.365	-0.006	0.196	0.925**	1.000	-0.156	0.484*	0.417	0.015
	Sig. (2-tailed)	0.114	0.980	0.408	0.000		0.510	0.031	0.067	0.951
Legal_3	Correlation	-0.154	-0.128	0.000	-0.038	-0.156	1.000	0.056	0.258	-0.198
	Sig. (2-tailed)	0.518	0.590	1.000	0.875	0.510		0.815	0.273	0.403
Arr_1	Correlation	0.301	0.420	0.655**	0.452*	0.484*	0.056	1.000	0.640**	0.621**
	Sig. (2-tailed)	0.197	0.065	0.002	0.045	0.031	0.815		0.002	0.003
Arr_2	Correlation	0.038	0.270	0.514*	0.406	0.417	0.258	0.640**	1.000	0.342
	Sig. (2-tailed)	0.872	0.249	0.020	0.076	0.067	0.273	0.002		0.140
Arr_3	Correlation	0.545*	0.505*	0.593**	0.133	0.015	-0.198	0.621**	0.342	1.000
	Sig. (2-tailed)	0.013	0.023	0.006	0.577	0.951	0.403	0.003	0.140	

* correlation is significant at the 0.05 level (2-tailed)

** correlation is significant at the 0.01 level (2-tailed)

With respect to correlation between indicators, which represent the *same* dimension we found significant correlations only between two pairs of indicators within the supporting arrangements dimension and one pair of indicators within the legal and regulatory dimension. There is no significant correlation among the three indicators, which represent the policy and political support dimension. Little correlation between indicators, which represent the same dimension suggests that these indicators by and large capture different aspects of PPP supportiveness within each dimension independently.

In order to analyse possible implications of the three methodological concerns a cluster analysis is conducted in the next section that groups countries with similar profiles regarding governmental support towards PPP. This allows us to reconsider the clustering based on the PPP-GSI and to examine whether different techniques of analysis render fundamentally different clusters.

3.4 Classifying governmental PPP support by cluster analysis

In order to be able to group countries with similar governmental PPP support profiles, i.e. the composition and level of government support, and to distinguish them from the other countries with dissimilar profiles, we apply hierarchical clustering with agglomerative methods to specify such clusters among the 20 European countries included in our study. We conducted the clustering by examining nine indicators: three indicators related to policy and political commitment, three indicators regarding legal and regulatory framework and three indicators referring to PPP supporting arrangements. We applied clustering analysis resulting in three, four and five groups (being different levels of single solution), but the analyses with four groups of countries set as single solution yielded the clearest results in terms of grouping.

In this study we conducted the cluster analysis with all six algorithm methods (see table 3.A.1 in the annex D). However, complete linkage and Ward's method provide the most balanced and most internally coherent clusters. In the remainder of the chapter, we use the complete linkage method because it is superior both with regard to the internal coherence of clusters and lower standard deviations and coefficients of variance within clusters. Results of both methods are very similar (see table 3.A.1 in the annex D). When comparing both methods the position of only three countries is a matter for discussion, being Italy (IT), Serbia (RS) and Slovenia (SI). When using complete linkage these countries are categorised into two different clusters: Italy is agglomerated in the cluster with Switzerland, Czech Republic, Denmark and Slovak Republic and Serbia as well as Slovenia is grouped into the largest group of eight countries. Using the Ward's Method, these three countries are grouped together in the group of France, Greece and Portugal. However, this re-clustering renders the cluster 1 somewhat more similar in terms of legal framework and the cluster 3 more homogeneous in terms of policy and political commitment, but increases the dissimilarities between the countries in group 4 to a large extent on multiple dimensions. Therefore, we decided to follow the clustering provided by the analyses based on complete linkage.

The results of hierarchical agglomerative clustering using complete linkage (see figure 3.A.1 in the annex D) frame the twenty countries into four clusters:

- Cluster 1 includes The United Kingdom, The Netherlands, Germany and Belgium-Flanders.
- Cluster 2 includes France, Greece and Portugal.
- Cluster 3 includes the Czech Republic, Denmark, Slovakia, Switzerland and Italy.
- Cluster 4 encompasses the most countries: Austria, Estonia, Serbia, Slovenia, Sweden, Cyprus, Finland and Hungary.

Figure 5 shows the four clusters schematically. We will now discuss the clusters, their basic government support profile and features as well as the extent to which some countries deviate from that profile on specific dimensions.

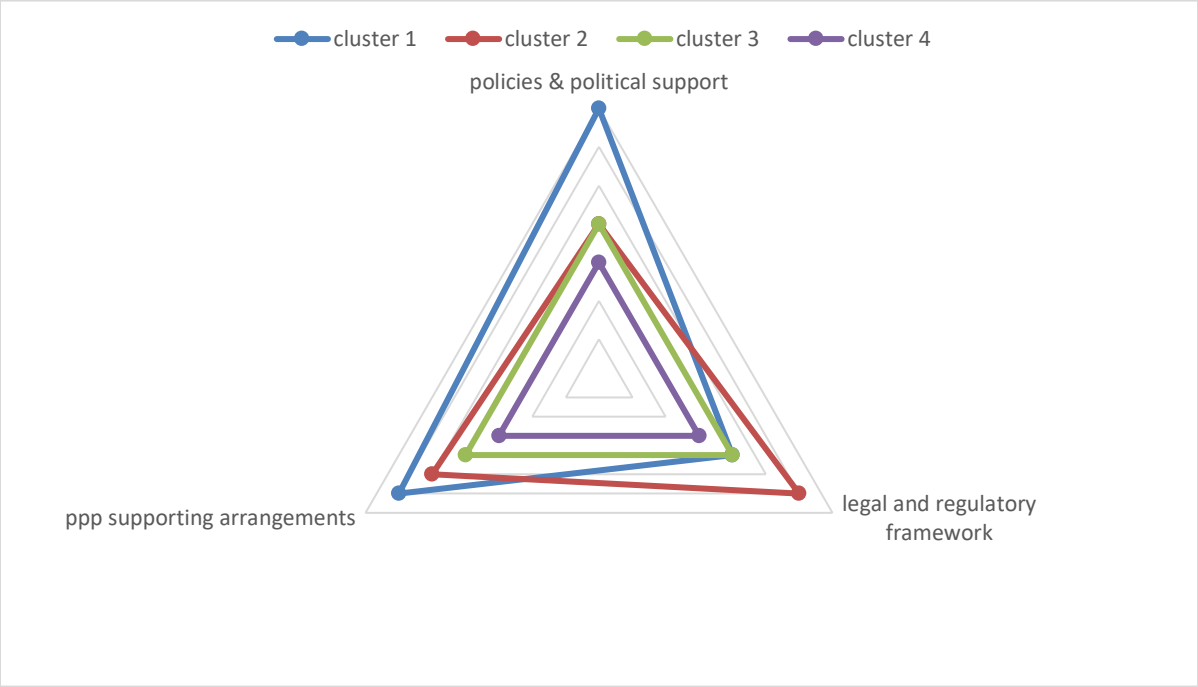

Figure 5 Schematic representation of the clusters

Countries in cluster 1 provide strong support on two dimensions of government support for PPPs and may be considered as strong supporters of PPPs through well-developed policies, political commitment and supporting arrangements. These countries have highly developed PPP policies with clear and updated strategy documents and PPP programs. Political support for PPP in these countries has been strong and has also remained, in most cases, stable in the recent period. PPP supporting arrangements in these countries are quite sophisticated with PPP units being present and rather well-developed since long, moderately developed procedures for project appraisal and prioritization and the use of standardized processes and documents. However, these countries have, overall, less extensively developed legal and regulatory frameworks compared to with countries in cluster 2, with the emphasis being on defining elements in the general procurement law rather than issuing general PPP laws. In the group of 20 countries under review, the UK, The Netherlands, Germany, and to a lesser extent Belgium-Flanders belong to this cluster.

The United Kingdom has a history of government support for PPP since more than 20 years. The Private Finance Initiative (PFI) was established by the Conservative Government in 1992. Then, the new Labour Government continued with PFI in 1997 and provided the resources within the Treasury and government departments to set priorities, improve the basis of project selection, and develop both the process and a standard contract (PPP Forum, 2014). Standardised PPP contracts are used in several sectors. When it comes to the legal and regulatory underpinning of PPPs, the UK focuses on sound and encompassing procurement laws rather than issuing specific PPP laws. The UK has regulated public procurement in the 'Public Contract Regulation 2006'.

In the Netherlands, PPP were first mentioned in official government documents in 1986, while being introduced in the coalition agreement of the Kok II Cabinet (the second coalition of the Social Democrat Party and the Liberal-Conservative Party) in 1989 (Klijn, 2009). There is no PPP law in the Netherlands. However, public procurement is regulated by the Public Procurement (Tendering Rules) Decree (Bao) (the 'Procurement Decree') and the Tendering (Special Sectors) Decree (Bass) (the 'Special Sectors Decree'). The Decrees have implemented the Directive 2004 / 18 / EC (CMS Legal Service EEIG 2010). The PPP Knowledge Centre was established within the Dutch Ministry of Finance in 1999, developing supporting instruments such as public sector comparator, checklists for the different contract types, standard tender documents and guidelines for project procurement and contract management (OECD 2010).

Germany first introduced PPP under Chancellor Gerhard Schröder in 2001. There is no specific PPP law that encompasses all legal requirements relating to PPP projects. The German Government has taken a positive approach to PPPs. For instance, several laws regarding PPP were amended through the PPP Acceleration Act of 2005. The PPP Acceleration Act partly transposed Directive 2004 / 18 / EC on procurement law into German national law. The aim of this Act was to remove obstacles and barriers to PPP identified by the government in a Federal Report on PPP (CMS Legal Service EEIG 2010). The Federal Ministry of Finance and *Partnerschaften Deutschland-ÖPP Deutschland AG* (Partnerships Germany) share responsibility for PPP at the federal level. Partnerships Germany itself was established in 2009 as a central unit to provide advisory services to public sector clients (e.g. the federal government, the federal states, the municipalities) (OECD 2010).

Belgium-Flanders has a somewhat unique position in this group as it deviates on some aspects from the other countries. The policy document for PPP was first introduced in the Coalition Agreement of the Flemish Government in 1999, but its PPP programs were less explicit in terms of planned projects and time schedules. The Flemish Government established the Flemish PPP Knowledge Centre in mid-2002, in which it has four main functions: field developer, knowledge broker, process guide and added value monitor. As to the legal and regulatory framework, The Flemish Parliament passed the Flemish Parliament Act on Public Private Partnership in July 2003, with the act covering PPP-related concepts, role of PPP Knowledge Centre and legal facilities (Vlaams Kenniscentrum PPS 2014). The public body under auspices of the Ministry of the Interior called the PPP Knowledge Centre was established in 2002 and it has developed standardised processes and contract documents, although procedures for project appraisal and prioritization are less well developed (van den Hurk & Verhoest, 2013). The

Flemish Government accepted a general PPP Decree in 2003, aimed at supporting public-private initiative in Flanders, besides provisions in the general procurement law in line with EC directives.

Countries in cluster 2, encompassing Greece, Portugal and France, are strong legal and regulatory supporters of PPPs as government support of PPPs focuses on articulating an appropriate legal and regulatory framework. These countries also have strong PPP supporting arrangements, although policy and political commitment towards PPP is rather modest. There are some differences between the countries to be noted.

Firstly, unlike France and Portugal, Greece has designed PPP programme with clear pipeline and timetable and which is regularly updated. Greece set up PPP laws (Law 3389/2005), in which the law defines procuring authority to be the public entity with competence in the relevant sector and includes local governmental authorities, legal entities under public law and *sociétés anonymes* (with share capital subscribed by the mentioned public entities). In addition, in order to formulate policies, an Inter-Ministerial Committee for Public and Private Partnerships (IM PPP Committee) was established in 2006 (OECD, 2010).

Secondly, Portugal expressed rather strong political support for PPP, which is still said to be increasing. Portugal has a long history of public service concessions that started in the 1970s, initially in the transport and water sectors. The high development of PPP activity was signified by the Vasco de Gama bridge concession contract in the mid-1990s. The Budgetary Framework Law 91/2001 was the first legislation issued by the government. Later, the government published the PPP Decree-Law 86/2003 (amended in 2006 by Decree-Law 141/2006), which provided general, largely procedural, guidance on PPPs and allowed for the establishment of sector specific regulation (EPEC 2014). A PPP unit (*Parpública SA*) was established in 2003 as a private limited company owned completely by the Treasury, having as main functions policy guidance and technical assistance to ministries regarding PPP procurement processes (OECD 2010).

France has not issued a clear PPP strategy document as well as PPP programmes, although PPP in France has been introduced in the form of concession arrangements since the beginning of the second half of the second half of the twentieth century. France introduced the first form of government-paid PPP contract (*bail emphytéotique administrative)* in 1988. New legislation, creating the *contrat de partenariat* (partnership contract), was introduced in 2004, and the PPP unit (*the Mission d'appui aux partenariats public-privé or "MAPPP"*) also was created (EPEC 2012). In contrast to the other countries in this cluster, France has developed standardized documents and processes to a substantial level, while the others have not done as much.

Countries in cluster 3 have developed most elements of government support of PPPs but at a limited or moderate scale compared to the countries in cluster 1; they are considered moderate supporters of PPPs. The five countries included in this cluster are Italy, Switzerland, Czech Republic, Slovak Republic and Denmark. Political support in most of these countries is low, only in Italy has political support of PPP been relatively high and increasing. In most countries a PPP strategy document has been published early, but it has not been updated, and most countries do not issue PPP programmes with planned projects. Almost all countries have a procurement law, that is in line with the EU

procurement directives; only Denmark has no national procurement law and implements the EU procurement directives directly (Petersen, 2013). In Italy, public procurement is regulated by the Code, which implemented EU Directives 2004 / 17 and 2004 / 18 (CMS Legal Service EEIG 2010). In the Czech Republic all PPP would be procured according to general law after the update of the national public procurement law in 2012. PPP units in most countries are developed only to a limited degree, the same holds for the definition of procedures for project appraisal, project prioritization and the role of main sectors in PPP projects stages.

Finally, cluster 4 consists of eight countries (Austria, Estonia, Sweden, Finland, Serbia, Slovenia, Cyprus and Hungary), which are the least articulated providers of government support for PPP. Political commitment to PPP tends to be rather limited in general and, except Hungary no country in this cluster has developed a clear PPP programme. On the legal side all countries focus on national procurement law; only Slovenia has drafted a general PPP law. All laws are in line with the EU procurement directives. In most countries a PPP unit either does not exist or had existed only for a very short period like in Austria (Scherrer 2013), or such a unit is only developed to a rather limited degree (Serbia is an exception here). In most countries procedures for project appraisal and project prioritisation and a definition of the role of main sectors in project stages of PPP projects do not exist. There is no standardisation of processes or documents for PPPs in transport in any of these countries.

How does, finally, the pattern of country clustering compare to the country ranking obtained through the PPP-GSI method? Figure 6 compares the 20 countries according to their scores and rank in terms of PPP-GSI on the one hand and the country clusters resulting from the cluster analysis on the other hand. The results of the PPP-GSI are largely confirmed by the cluster analysis as the composition of the clusters follows (with one exception) the ranking of the PPP-GSI. Cluster 1 resulting from the cluster analysis (the strong supporters of PPPs on all three dimensions) includes the three countries with the highest PPP-GSI. Cluster 1 also includes one country which scores markedly lower (Belgium) on the PPP-GSI and which has a similar PPP-GSI score as two other countries included in cluster 2 (strong legal and regulatory supporters). Cluster 3 (moderate supporters of PPPs) continues to follow the rank order of PPP-GSI scores with the exception of Denmark. Again with this exception, cluster 4 (the least articulated providers of government support for PPP) is congruent with the group of countries with the lowest PPP-GSI scores.

In conclusion, the clustering of countries by cluster analysis suggests that the PPP-GSI's methodological properties have no major distorting effect on the resulting ranking of scorings. The cluster analysis showed, however, that grouping countries along predefined threshold values of the PPP-GSI might lead to what are, indeed, somewhat arbitrary results. Finally, it is obvious that an index that comprises several different dimensions and calculating index scores based on averages may entail rankings which have countries which are characterized by dissimilarities along one or more dimensions ranked as neighbours, and this cannot be ruled out in the case of PPP-GSI. This topic will be analyzed in the next section.

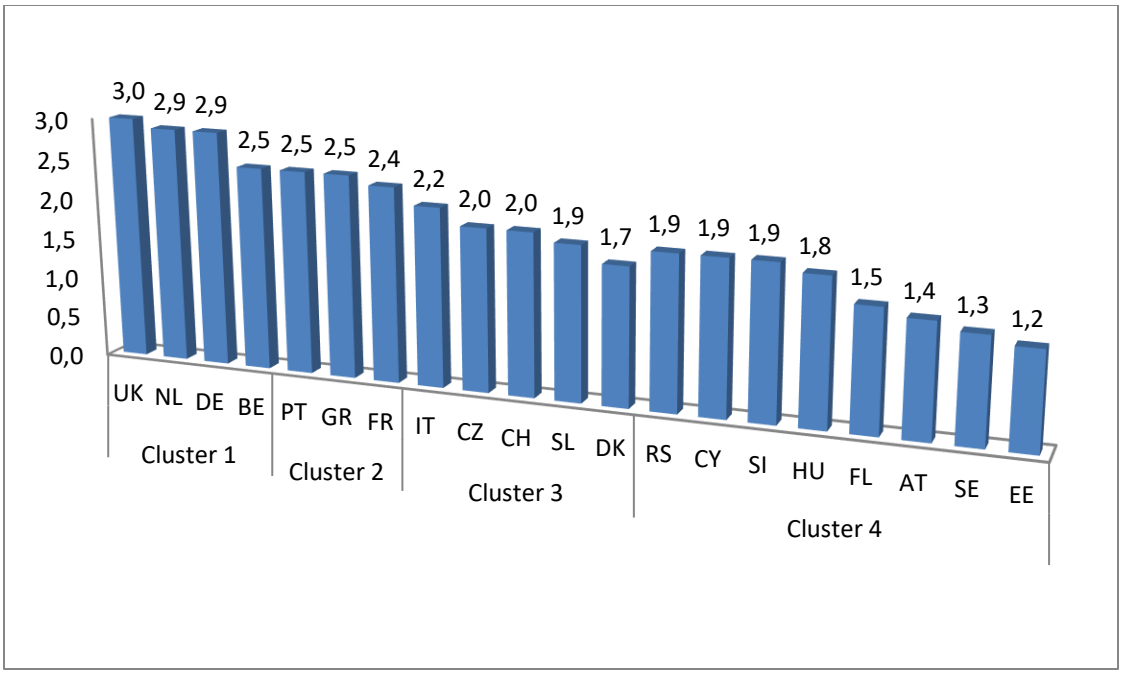

Figure 6: Comparison of country groupings: PPP-GSI vs. cluster analysis

3.5 Digging deeper: differences and similarities between countries in PPP policies, regulations and supporting arrangements

The analysis of the PPP-GSI and its sub-indexes showed that in no country in this sample government support for PPP is high on all three dimensions (see Table 7). In this section therefore we group the 20 countries according to their degree of governmental support for PPPs for each of the three dimensions separately. Within each dimension we group countries into four clusters using cluster analysis again (see table 8).

On the dimension 'PPP policy and political commitment', the first cluster consisting of three countries (the Netherlands, the United Kingdom and Germany) form the group of 'strong policy and political supporters'. In all three countries a PPP strategy document was published early, and in two countries it has been updated. All three countries have a PPP programm with a clear pipeline and time schedule, again, in two countries the programmes have been updated. Political support is rather strong in all three countries, in two of them political support tends to increase or is stable while in one country it tends to decrease.

The second cluster consisting of three countries, again, (Belgium-Flanders, Portugal and Italy) is characterized by strong and increasing political support ('strong political supporters'). In this group only one country has a clear PPP strategy document (but not updated) and only one country has a PPP programme (although without a clear pipeline and time schedule).

In the third cluster ('strategy developers providing modest political support'), which comprises four countries (Switzerland, Czech Republic, Denmark and Slovakia), a PPP strategy document has been

published early; in one country it was updated. Two countries have a PPP program but no clear pipeline and time schedule, while two countries have no PPP programme at all. Political support of PPP in general is low within this group; in two countries political support tends to increase.

Table 8: Country clusters along the dimensions of government support for PPP

Dimensions of government support for PPP		
Policy & Political commitment	*Legal & regulatory framework*	*PPP supporting arrangements*
Cluster 1: "*Strong policy and political supporters*" 3 countries: NL, UK, DE	Cluster 1: "*Providers of comprehensive legal and regulatory support*" 3 countries: FR, GR, PT	Cluster 1:" *Providers of comprehensive PPP supporting arrangements*" 5 countries: FR, BE, NL, DE, UK
Cluster 2: "*Strong political supporters*" 3 countries: BE, PT, IT	Cluster 2: "*Providers of an intermediate level of legal and regulatory support*" 3 countries BE, RS, SI	Cluster 2: "*Strong providers of PPP supporting arrangements*" 1 country: PT
Cluster 3: "*Strategy developers providing modest political support*" 4 countries: CH, CZ, DK, SL	Cluster 3: "*Providers of legal and regulatory support with a clear focus on national procurement law*" 12 countries: DE, HU, AT, FL, SL, SE, UK, NL, IT, CY, CZ, CH	Cluster 3: "*Intermediate level providers of PPP supporting arrangements*" 10 countries: CH, CZ, DK, GR, IT, RS, SI, CY, SL, HU
Cluster 4: "*Modest policy and political supporters*" 10 countries: AT, EE, FR, GR, RS, SI, SE, CY, FL, HU	Cluster 4: "*Providers of limited legal and regulatory support*" 2 countries: DK, EE	Cluster 4: "*Providers of no or limited PPP supporting arrangements*" 4 countries: AT, EE, FL, SE

The fourth cluster includes ten countries: Austria, Estonia, France, Greece, Serbia, Slovenia, Sweden, Cyprus, Finland, and Hungary. It is the largest one and contains the 'modest policy and political supporters'. None of these countries has a clear PPP strategy document, and the majority of countries have no PPP programme. Political support in general is rather limited, in the majority of countries political support is stable at this level or even further decreasing.

On the dimension 'Legal and regulatory framework', three countries (France, Greece and Portugal) form the first cluster of 'providers of comprehensive legal and regulatory support'. In this group countries have published general PPP laws with a clear scope and boundaries.

A second cluster consists of three countries (Belgium, Serbia and Slovenia), which may be considered 'providers of an intermediate level of legal and regulatory support'. Two countries have general PPP laws, which are moderately developed in scope and boundaries. In two countries the general legal framework provides regulations that are specific for PPPs. The 12 countries in the third cluster (the United Kingdom, Germany, the Netherlands, Hungary, Austria, Finland, Slovak Republic, Sweden, Italy, Cyprus, Switzerland and Czech Republic) are 'providers of legal and regulatory support with a

clear focus on national procurement law'. There is no PPP law and no PPP-specific regulations in general law but the procurement law is considered sufficient in providing a legal frame for PPPs.

The fourth cluster which, includes two countries (Denmark and Estonia) can be characterised as 'providers of limited legal and regulatory support'. One of these countries applies European Union law directly as there exists no national public procurement law.

On the dimension 'PPP supporting arrangements', five countries (France, Belgium-Flanders, the Netherlands, Germany and the United Kingdom) form the first cluster of 'providers of comprehensive PPP supporting arrangements'. All countries have (at least) one dedicated PPP unit; in one country the unit can be considered as being highly developed. Three countries have moderately developed procedures for project appraisal, for prioritization of projects and for the roles of main actors in project stages; in two countries these procedures are not quite as highly developed. All countries have developed standardised processes and documents for use in the PPP procurement process; in four countries the degree of standardisation can be considered high.

The second country cluster is formed by only one country (Portugal), which is considered a 'strong provider of PPP supporting arrangements'. Portugal has a moderately developed PPP unit and highly developed procedures for project appraisal, project prioritization and the roles of main actors in project stages, but there are no standardised processes and documents.

The third cluster consists of 10 countries (Switzerland, Czech Republic, Denmark, Greece, Italy, Serbia, Slovenia, Cyprus, Slovak Republic and Hungary) in which PPP supporting arrangements are less well developed ('Intermediate level providers of PPP supporting arrangements'). All countries in this cluster have a PPP unit and developed procedures for project appraisal and project prioritisation. In the majority of countries these units and procedures are less well developed than in the first and second country groups. No country has standardised processes and documents for procuring PPP projects.

Finally, the fourth cluster includes four countries (Austria, Estonia, Finland and Sweden) which are 'providers of no or limited PPP supporting arrangements'. These countries neither have a dedicated PPP unit (one country briefly had such a unit but abandoned it) nor have standardised processes and documents for procuring PPP projects. Only one country has developed clear procedures for project appraisal and prioritisation.

3.6 Conclusion: relevance of clustering, limitations and future research

The starting point of the chapter was the observation that PPPs are enjoying an upsurge of global interest and are often considered a converging policy phenomenon both in academic publications and practitioner reports. Yet our analysis reveals significant and enduring divergences in governmental PPP policies, regulations and institutional support mechanisms across countries. The chapter compares governmental PPP support activities across a sample of 20 European countries and, thus, provides a firm foundation for comparing and evaluating convergence and divergence in governmental PPP support across countries from all parts of Europe with different levels of PPP activity. Based on previous work (Verhoest et al., 2015) and a review of comparative PPP literature, we focus on policy,

regulation and support organisations as indicators of governmental PPP support. We conduct cluster analysis with the aim of examining similarities and differences between countries and grouping countries with (more or less) similar governmental PPP support profile.

The 20 countries are grouped into four clusters. Cluster 1 includes the UK, Netherlands, Germany and Belgium-Flanders, which are countries with well-developed policies, political commitment and supporting arrangements. Countries in cluster 2, encompassing Greece, Portugal and France are strong legal and regulatory supporters of PPPs as their government support emphasises the articulation of an appropriate legal and regulatory framework. Countries in cluster 3, encompassing the Czech Republic, Denmark, Slovakia, Switzerland and Italy, have developed most elements of government support of PPPs but at a more limited or moderate scale; they are considered moderate supporters of PPPs. Lastly, cluster 4 consists of eight countries (Austria, Estonia, Sweden, Finland, Serbia, Slovenia, Cyprus and Hungary), which are the least articulated providers of government support for PPP.

Comparing the four clusters along three different dimensions reveals considerable variation. Only the United Kingdom, the Netherlands and Germany are always positioned in the same cluster with regard to all dimensions, as they deliver strong policy and political commitment, provide comprehensive PPP supporting arrangements, and provide regulatory support with a clear focus on national procurement law. The rest of countries shift clusters in term of respectively policies, regulations and arrangements for PPP. We are thus witnessing divergence in practice besides convergence in rhetoric. This means that we are witnessing convergence in the global PPP policy rhetoric but widespread and enduring divergence in the actual policies, regulations and supporting arrangements enacted by governments to support (or hinder) the uptake of PPPs across countries.

Our study is subject to limitations, however. First, our concept of government support for PPPs deliberately comprises exclusively elements, which can be influenced by government more or less directly. In addition to government support for PPPs, other elements also contribute to PPP market maturity like macroeconomic variables and the investment climate. Moreover, we cannot take account for political actors who may adopt reforms to legitimise themselves, but 'decouple' these reforms from their actual decision making behaviour (Meyer & Rowan 1977; Powell & Di Maggio 1983). Second, most of our (sub-) indicators are of a static nature, while, ideally, government support should be measured in a dynamic way in order to observe the change of policies and political commitment, regulations and PPP supporting arrangements over time more precisely.

Further comparative PPP research could explore the possible link between the macro-economic and fiscal conditions in a country and its governmental PPP support based on the results of the PPP-GSI and the clusters analysis. This, in turn, could be linked to PPP activity in the respective countries. PPP research should also pay attention to and explore the possible link between less formal institutional aspects such as administrative culture and PPP activity. A widened research agenda on governance of PPPs would also benefit from investigating the multi-level governance aspect of PPPs more closely. This could include studies on the link and possible interdependencies between institutionalised PPP support at supra-national and national levels of government. Future comparative PPP research should address these and related issues.

Section 2

Explaining Variation PPP Governmental Support across 20 European countries

Chapter 4

Why do countries differ in terms of governmental support for public-private partnerships (PPPs)? Explaining variations in PPP support in twenty European countries[16]

Murwantara, R., Verhoest, K., Petersen, O.H., & Scherrer, W.

[16] **Not published yet but has been presented at international conferences.**

4.1 Introduction

Public private partnerships (PPPs) have become an eminent topic among researchers in multiple fields including public policy, economics, management, engineering, and public administration. At the global level PPPs have been reinforced by isomorfic pressures propagated by international organisations and consultancy firms endorsing PPPs as preferred policy solutions (Verhoest, Petersen, Scherrrer and Sociepto, 2015). However, recent streams of comparative PPP research have illustrated that national governments have responded to these isoporphic pressures in divergent ways with governmental responses being modified by national politico-administrative traditions and macro-economic contexts (Greve and Hodge, 2007; Jooste et al., 2011; Petersen, 2011). In broader public policy studies, several researchers have examined the association between the types of policies and the nature of politico-administrative systems in which these policies have been developed by arguing that both policy content and form of public policy-making vary according to the nature of a politico-administrative system and the types of links decision-makers have with society (Christensen and Lægreid, 2007; Pollitt, Thiel and Homburg, 2007; Verhoest et al. 2010; Pollitt and Bouckaert, 2011). Other policy studies have also examined the effect of macro level socio-economic on public policy making.

In the two preceding chapters we developed a PPP Governmental support Index (PPP-GSI) allowing to measure and compare the PPP-enhancing support in terms of policies and political commitment, legal and regulatory frameworks and supporting arrangements (like PPP-units, standardization, ex ante evaluation instruments) by central governments. This governmental PPP support varies considerably across European countries with different politico-administrative systems and macro-economic conditions (Verhoest et al., 2015). In this paper, we study the influence of macro-institutional variables and macro-economic characteristics of particular countries on the extent to which these countries develop governmental support for PPP (i.e. level of PPP-GSI).

This study deals with the following research question: *To what extent can variations in PPP governmental support across European countries be explained by macro-institutional and macro-economic features of these countries, and by combinations of these features?*

More specifically, the paper examines the relevance of five macro-institutional and macro-economic conditions selected for explaining the level of PPP governmental support: (1) the degree of centralization of polity (state structure ranging from centralized-unitary states to federal state structures), (2) the administrative reform history (level of NPM-inspired administrative reform) (3) the risk-averseness of the societal culture leading to more regulation and procedures (measured by the Uncertainty Avoidance Index by Hofstede 2001), as well as macro-economic characteristics represented by (4) the evolution of GDP per-capita and (5) the evolution of total government debt (as % of GDP). Interestingly, as this chapter will show, these macro-institutional and macro-economic variables, both individually as well as jointly, help to explain the level of governmental support for PPPs across countries.

The chapter is structured as follows. In the next section we build upon theories of policy diffusion and the transformative perspective of Christensen and Laegreid (2011, 2007) in order to structure and

choose the macro-institutional and macro-economic features of countries that we will include in our study. We also develop specific propositions about how these variables and combinations thereoff will influence the PPP governmental support in a given country (Section 2). Then, in a section on methodology and datasources, more information is given about the data collection as well as about which analytical tool is used to conduct this analysis. The country profile database from the COST Action TU1001 database covering twenty European Countries is used. In this chapter we perform fuzzy-set Qualitative Comparative Analysis Method (fs-QCA), in order to explain the presence or absence of PPP governmental support (Section 3). In the fourth section of the chapter, we analyse the relationships between the macro-institutional variables and macro-economic characteristics as conditions on the one hand and the degree of PPP governmental support as an outcome using fs-QCA (Section 4). Then, in the penultimate section, we explore in-depth the relations between these conditions and the three dimension of PPP-GSI by using the country groups developed in the previous chapter (Section 5). Finally, we discuss the usefulness as well as the limitations of the analysis and provide a conclusion (Section 6).

4.2 Literature review

A transformative perspective on countries' responses to international pressures

Policy adoption, but not straightforward

The spread across countries of acclaimed PPP-enhancing institutional frameworks in terms of policies, regulative frameworks and supporting arrangements can be considered as a triple process. At first governments acting as early adopters experimented with different institutional frameworks when trying to stimulate the development of PPPs in their country. At a later stage, these country-specific practices got noticed, evaluated, codified and instrumentalised in the form of manuals, decision making tools, and guidelines by international and regional organisations. These international and regional organisations like the OECD, World Bank, European Reconversion and Development Bank and the International Monetary Fund in this way propagated the creation of what they consider as an optimal institutional environment for PPPs. International consultancy firms similarly developed and proclaimed such best practices. Finally, other countries aiming to introduce and stimulate PPPs adopted these practices, directly by copying them from the early adopting countries or by following guidelines, manuals and best practices proclaimed by international and regional organisations and consultancy firms. This happened through mechanisms of policy diffusion by which, the 'knowledge about policies, administrative arrangements, institutions in one time and/or place is used in the development of policies, administrative arrangements and institutions in another time and/or place' (Dolowitz and Marsh, 1996: 344). Transnational policy diffusion can occur through various mechanisms, namely coercion, competition, learning, and emulation. Coercion is the imposition of a policy by powerful international organizations or countries; competition means that countries influence one another because they try to attract economic resources; learning means that the experience of other countries can supply useful information on the likely consequences of a policy; and emulation means that the

normative and socially constructed characteristics of policies matter more than their objective consequences (Gilardi, 2012; Shipan and Volden, 2008).

These mechanisms of policy diffusion relate very closely to what is called processes of isomorphism, meaning that actors (countries in our case) become more alike. According to DiMaggio and Powell (1983), three different processes or mechanisms may produce isomorphism in a certain field: coercive adoption, normative adoption and mimetic adoption (cf. also Christensen et al., 2007c). Coercive adoption of policies across countries happens when governments, via laws or regulations, are instructed to implement certain standards. In such a situation governments have no other choice. This may apply, for instance, to public procurement regulations as issued by transnational authorities like the EU. Normative adoption refers to the kind of dissemination and adoption that arises from the common norms, values, knowledge and networks held or engaged in by various professional groups, like consultants or public managers which are increasingly internationally networked. Examples of this can be the prominent role of specific international consultancy and lawyer firms which are active in PPP projects all over the globe and transposing their knowledge and experience gained in one national context to another as blueprints. EPEC is an example of such platform where national civil servants interact with colleagues from other European countries and get socialized with acclaimed optimal institutional environments for PPPs. Mimetic adoption often occurs when governments – in situations marked by great uncertainty – try to emulate governments who are perceived to be successful. Governments with unfavourable economic and budgetary conditions copied other governments which were perceived to make good use of PPPs as one of the strategy to increase economic growth and fiscal returns through infrastructure investments. Usually this takes the form of imitation without much preliminary calculation and analysis.

In short, governments face homogenizing and isomorphistic pressures to adopt these acclaimed PPP-enhancing institutional frameworks in terms of policies, regulative frameworks and supporting arrangements. These pressures for *institutional transplantation* from one context to another is a consequence of the globalization of economies (Farazmand, 2001); the related compression of time and space leads to 'institutional transplantations at increasing speed over greater distances' (Mamadouh et al., 2002: 6).

But what kind of ideal institutional environment is proclaimed by international organisations and consultants? Elaborating on the work of multiple scholars (Mahalingam et al. 2011; see also Matos-Castaño et al., 2014; Delhi et al., 2010; Jooste et al., 2011) and based on an extensive review of PPP-related policy documents from international organisations, like the OECD, World Bank, regional development banks like the Asian Development Bank and the EIB, affiliated units like EPEC and UNECE, and private agents involved in PPP (see e.g. Deloitte, 2007; EIB, 2011; Economist Intelligence Unit, 2011; EBRB, 2012; EPEC, 2011a; OECD, 2008; UNESCAP, 2005; World Bank & PPIAF, 2006), Verhoest et al. (2015) distinguish three dimensions in this propagated ideal-type institutional setting, encompassing (a) clear policies and political commitment; (b) legal and regulatory provisions; and (c) supportive arrangements for expertise, procurement and contract management,

standardisation and evaluation in order to enhance the prosperous development of PPPs. All three dimensions refer to how governments can support PPPs in their development by adopting enhancing policies, regulations and supporting arrangements. More precisely, Table 9 shows which elements are entailed in what Verhoest et al. (2015) hence call the extent of PPP governmental support which is proclaimed by these actors.

Table 9: Key dimensions of governmental PPP-support and operationalization of indicators.

Dimension	Indicators	Sub-indicators
Policy and political commitment	Existence of a strategy document of PPP policy (time of issuing and updating)	
	Existence of a general PPP programme (incl. time schedule)	
	Political support (level and evolution over time)	
Legal and regulatory framework	Specific PPP or concession law: (a) existence	(1) General PPP or concession law; (2) PPP law in transport; (3) procurement law; (4) in-line with EU
	Specific PPP or concession law: (b) scope regarding definitions of four items	definition of (1) PPP; (2) eligible sectors and types of infrastructures/ services; (3) contracting authorities; (4) eligible private party
	Elements provided in the general legal framework (including public procurement law)	4 sub-indicators covering procedures and recommendations, 5 sub-indicators about mandatory provisions in PPP contract[17]
PPP-supporting arrangements	Acting public institutions/PPP-supporting units	Existence of a PPP support unit and time
		Legal and organisational basis of PPP support unit
		General functions PPP Support unit (Dissemination, policy function and green lighting)
		Staff size of unit
	Procedures for project appraisal and prioritisation, role of main sectors in project stages	Existence of standard ex ante evaluation instruments
		Use of standard ex-ante evaluation in PPP projects
		Existence of a third party scrutinizing and approving PPP projects before project on tender

[17] Does the prevailing legislation include provisions and procedures regarding the following elements: selection of private partner through competitive procedures; non-competitive procedure in exceptional circumstances; procedures for unsolicited proposals; review procedures; contract termination events; compensation provisions; provisions for collection of fees or payments by government; public authorities to support and provide guarantees and step-in rights for lenders or substitution by a new private partner?

		Existence of a third party scrutinising and approving PPP projects before final contract signed
	Standardised processes and documents for PPPs in transport	Use of standardised contracts for PPP in transport
		Use of standardised PPP model in transport

Source: Verhoest et al. (2015)

Variation in adoption across countries: the transformative approach

However, although countries face similar isomorphistic pressure for adopting this internationally propagated 'ideal-type' of PPP governmental support, the implementation of it varies extensively across countries. In the abovementioned article, Verhoest et al. (2015) show that in a group of 20 European countries, some countries have adopted most elements, while other countries have hardly developed any of them. How can we explain this variance theoretically? Theoretically, this apparent lack of convergence towards this 'ideal-type' of PPP governmental support resonates with the extensive debates in public management literature about diffusion of public management reform doctrines across countries. Several authors point at different reasons why these international reform doctrines get adopted in very different ways and degrees across countries (see also Verhoest et al., 2010). Pollitt and Bouckaert (2004, Chapter 2) explain the different emanations of public management reform in twelve OECD states by presenting reforms as products of elite decision making which are inspired, triggered or restrained by international public management ideas, in interaction with country-specific socio-economic forces and environmental events (like scandals), existing administrative structures and cultures, and characteristics of main actors in the political system. In their model, all these factors may create a considerable distance between, respectively, international reform ideas, the content of an announced reform program, the implementation of that reform program, and its actual outcomes (see also Wollmann 2003b, 2004). In their so-called *transformative perspective*, Christensen and Lægreid (2001: 24) emphasize how external reform concepts and programmes are filtered, interpreted and modified by a combination of the national political-administrative history and culture, as well as national polity features. They also point at environmental factors such as the economic situation (see also Verhoest et al., 2010).

So, the extent to which governments are receptive for these ideas, and the extent to which these ideas are actually translated in decisions and actions, is influenced and transformed by country-level factors. Figure 7 shows the logic behind the transformative perspective (2001b, 2001c, 2007a). First, there are international-supranational pressures for governments, which stimulate them to create PPP-enhancing institutional environments in terms of policies, regulations and supporting arrangements. These factors include regulatory, normative, and economic pressures for isomorphism. Examples of this type of pressures are: meta-regulation by the EU, e.g. on procurement, public debt, and national budget; the propagation of PPP by international organizations, based on the New Public Management (NPM) discourse or related neoliberal doctrines; as well as the globalization of the economy.

Second, at national level several macro-institutional and macro-economic conditions shape the context in which governmental actors decide whether or not to implement elements of the internationally propagated 'ideal-type PPP governmental support' and in which form. Christensen and Laegreid (2001, see also Verhoest et al., 2010) point at the country-specific societal culture and administrative history, structural aspects of the polity, as well as environmental factors, which will lead to different responses and deliberative actions in different countries. Theoretically, this idea of transformation is partially rooted in historical institutionalism: changes of policies, regulations and structures within states are constrained by path-dependency (Pierson, 2004). Similarly theories on institutional transplantation claim that 'a deeper knowledge of the legal, politico-administrative and cultural traditions of both the donor country and the host country, as well as a specific analysis of the congruence between the transplant at hand and its future institutional environment are due'(De Jong and Mamadouh, 2002: 28). This is necessary because incompatibilities between donor and host societies may lead to hybrid institutional structures, dubious application and prioritisation of rules, confusion, complexity, and ultimately failure of the institutional transplantation (De Jong and Mamadouh, 2002: 30, see also Verhoest, 2011).

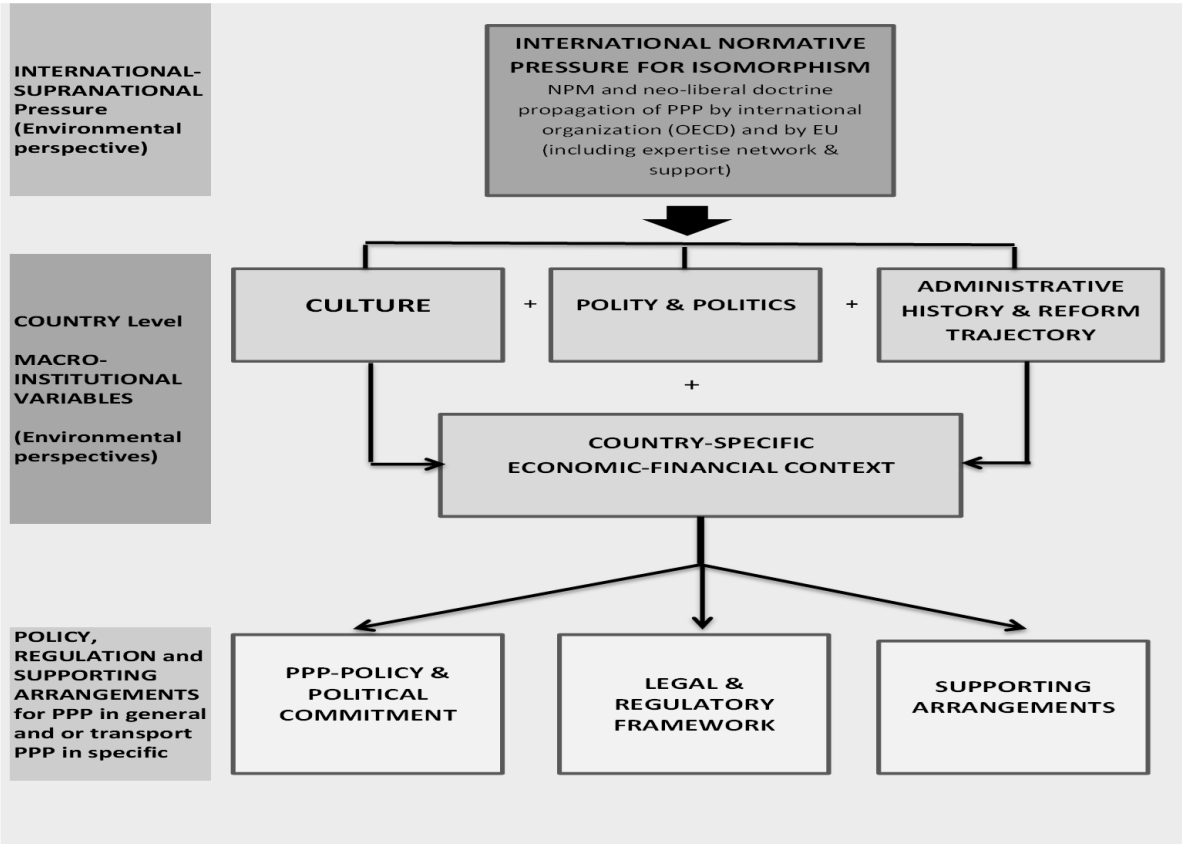

Figure 7: Macro-institutional and macro-economic factors influencing the development of PPP policies, regulations and supporting arrangements

Adapted Based on Pollitt and Bouckaert, 2004; Verhoest, et al., 2010. See also COST, 2013.

Following this logic of transformation, in this paper we study to what extent certain aspects of this country-specific context can explain (part of) the cross-country variation in PPP governmental support in 20 European countries.

Macro-institutional factors explaining cross-country variation

Theoretically, macro-institutional factors constrain or enable the development of certain policies, regulations and arrangements in countries according the 'logic of appropriateness' as major logic of action for actors (cf. March and Olsen, 1989). Elements and strategies for policy reform are chosen by policy makers and senior bureaucrats only when these are considered to be in accordance with what has worked well in the past, or because they are acceptable in the environment at the present time (Christensen et al., 2007). This logic of appropriateness refers to the central notion of path-dependency within historical institutionalism. Path-dependency refers to the tendency of actors to make choices (for example on organizational design) which are consistent with formerly taken 'paths' (Pierson, 2004; Peters, 2005). These 'paths' or legacies are quite resistant to change, because of both elements of socialization and of rational calculation (cf. Hall and Taylor, 1996). Macro-institutional factors shaping the extent to which countries adopt certain internationally proclaimed theories can relate to more structural aspects related to the polities of these countries, cultural aspects as well as historical aspects. We will only study some of these factors[18] which we consider to be of particular relevance for the issue of PPP governmental support.

Polity refers to the form or constitution of a politically organized unit, like a country. A basic structural aspect of this is the **state structure,** which refers to the distribution of authority across levels of government in that country (Lijphart, 1999). Whether the state structure of a country is unitary or federal has a crucial impact on the state policy capacity and on how states make and implement policies and their outcome (Fabbrini and Sicurelli, 2008 in Howlett et al., 2009). The vertical dispersion of authority from central government to lower levels of government is the largest within federal state structures and the smallest within unitary and centralized state structures (Pollitt and Bouckaert, 2011). Howlett et al. (2009) specifies the differences between unitary and federal systems. In an unitary system, the existence of a clear chain of command or hierarchy linking the different levels of government together in a superordinate/subordinate relationship reduces the complexity of multi-level government and policy making. There is also no constitutionally entrenched division of state power, allowing central government to retain ultimate sovereignty. On the other hand, in a federal state, at least two autonomous levels or orders of government within a country exist with the constitution itself prescribing a division of sovereignty between different governmental levels. Between these two extremes being the centralized unitary state structures and the federal state structure, one can define two in-between forms, more specifically the decentralized unitary state and the regionalized unitary state structure depending on whether constitutionally substantive authorities are vested in local

[18] The selected variables are not the only variables which we have considered for this paper, but arguably the most relevant ones. Annex A show what other factors could be considered as conditions and argue why these were not selected, due to reasons related to theory or methodology.

government or regional government (The European University Institute, s.d.; Committee of Regions, 2012).

We expect that a more centralised state structure, in combination with other factors, will create better conditions for a more extensive adoption of the internationally proclaimed set of PPP-enhancing policies, regulations and supporting arrangements, compared to state structures in which authority is more dispersed across governmental levels. There are two major arguments for this. A first argument is that in state structures with more dispersed authority, central governments have weak policy capacity (Howlett, 1999; McRoberts, 1993): it is difficult to develop consistent and coherent policies, because national policies in most areas requires intergovernmental agreement, which involves complex, extensive, and time-consuming negotiations among governments (Banting, 1982; Schultz & Alexandroff, 1985; Atkinson & Coleman, 1989). In federal systems (see Howlett, M. et.al, 2009) the public policy-making is often a long, drawn-out, and often rancorous affair as the different governments wrangle over jurisdictional issues or are involved in extensive intergovernmental negotiations or constitutional litigation. In addition, reform in states with highly dispersed authority are likely to be less broad in scope and less uniform in practice than in centralized states (Pollitt and Bouckaert, 2011). Their different levels of government are likely to want, and to be able, to go in different directions, or at least not all in the same direction at the same time. If external pressures are similar, state within a federation may adopt widely varying trajectories for management reforms (Halligan and Power, 1992; Lograin, 2003; in Pollitt and Bouckaert, 2011). So, unitary centralized states have much more capacity to push through consistent reform programs and to develop the necessary policies, regulations and supporting arrangements for these reforms. Such states can produce a strong decision about specific policies and regulation as well as pushing a high level of acceptance to execute these policies and regulations.

A second argument is of a more practical nature, being that in centralized states, the central government tends to be more heavily involved in the business of public service delivery (education, health care, etc.) and policy implementation, including the provision of infrastructures, compared to the central governments in decentralized states (where these functions tend to be taken care of by the lower tiers of government). In such countries, central government itself is confronted with the need for appropriate policies, regulations and arrangements for PPPs if there is a need for privately financed infrastructure. Consequently, consistent and sufficient supporting institutions may be developed and accumulated at central level, including the allocation of sufficient resources. In contrast, in states with more dispersed authority, lower levels of government will be in charge of most of the infrastructure development and potentially privately financed projects will be of larger interest to them. These lower tiers of government may develop their own supporting institutions and policies, such as a partial regulation for PPP, which applied only for their particular region or district. Consequently, delivering policy and regulation depends on each region or district, resulting in fragmented capacity for PPP support and making it harder to consolidate and streamline PPP governmental support at country-wide level. For instance, in such context, a standardization of process and contracts or clear expression of political support for PPPs seems hard to achieve at country-wide level. This can possibly refrain private investors or consortia from getting involved in PPPs in such countries.

Whereas state structure refers to a structural aspect of the macro-institutional context, is **societal culture** another crucial aspect which determines this appropriateness of policy reforms in a particular country. When confronted with external pressures for administrative and policy reforms which do not concur with the existing culture, governments may choose to 'structural decouple'. Then they neglect, resist these reforms or implement them merely symbolically (Meyer and Rowan, 1977, Christensen and Laegreid, 2007, see also Verhoest, 2011). Most definitions agree that culture consists of shared values, norms, appropriate behaviour and routines, rules and cognitive scripts, and symbols in a specific social group (Schedler and Proeller, 2007: 8-19). Several typologies of societal culture have been developed in literature, but in this chapter we will refer to the Hofstede dimensions of culture which is considered to be one of the most widely used and parsimonious typologies of societal culture in academic literature (Hofstede 1994; 2001). Hofstede's dimensions of societal culture embraces five dimensions such as: Power Distance (PDI), Individualism (IDV), Masculinity (MAS), Uncertainty Avoidance (uncertainty avoidance) and Long term Orientation (LTO)[19] (see also House et al., 2006).

We take only one of these dimensions into account which seems most relevant in order to explain different degrees of PPP governmental support, being the extent of uncertainty avoidance. In countries where the societal culture is highly uncertainty avoiding, actors tend to be **risk aversive**, resulting in more aspects of societal life to be codified in procedures and legislation (Hofstede 2001). Tamas (2007) revealed a high level of uncertainty avoidance creates a rule oriented society that institutes laws, rules, regulations and controls to reduce the amount of uncertainty. As PPPs are per definition complex projects with long term impacts and large stakes involved, risks associated with these kinds of projects are considered to be high. Public and private actors in such uncertainty avoiding societies will only engage in PPPs if they perceive the risks to be sufficiently mitigated. *In order to minimise the risks of PPPs failure, we expect governments in such countries will invest quite some resources and efforts in developing clear policies, extensive regulative frameworks (like specific PPP laws) and supporting arrangements* (like PPP units with substantive powers and expertise and standardised contracts).

As said, the extent to which the adoption of PPP-enhancing institutional framework is considered appropriate depends on its perceived consistency with formerly taken 'paths' (Pierson 2004; Peters 2005). Whereas the administrative history very much defines these paths, as much as more recently taken choices regarding the **administrative reform trajectory** of the involved country. PPPs as formalized contract mechanisms have their roots in the New Public Management[20], which propagated the superiority of private sector management over traditional public administration (Hood, 1991; Christensen and Lægreid, 2007). Based on neo-liberal and managerialistic logic, NPM aimed to introduce within the public sector the logic of market pressure, performance orientation, contractualisation of steering relations and a greater reliance upon private sector providers of public

[19] Power distance refers to the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally (Hofstede, 1994). Individualism links to societies in which ties between individuals are loose: everyone expected to look after himself or herself and his or her immediate family, whereas masculinity focuses on the degree to which 'masculine' values like competitiveness and the acquisition of wealth are valued over 'feminine' values like relationship building and quality of life. Uncertainty avoidance focuses on the level of tolerance for uncertainty and ambiguity within the society, and long term orientation focuses on the degree society embraces, or does not embrace, long-term devotion to traditional values.

[20] PPPs have also taken aspects from the post-NPM New Public Governance doctrine which stresses collaboration between multiple actors through networks and trust in order to reach commonly defined goals.

services (Pollitt, Thiel and Homburg, 2007). These aspects are central to PPPs, together with the logic of collaborative advantages. Extensive NPM reforms are said to enable public sector organisations to engage more easily with private partners in PPPs, as public sector organisations through NPM reforms gained more managerial autonomy and flexibility. Moreover, such reforms make PPPs as organisational form for the provision of public services more easily acceptable for civil servants and general public alike. *We expect that countries that already performed drastic NPM reforms in the past will more extensively adopt the internationally proclaimed 'ideal-type PPP-enhancing policies, regulations and supporting arrangements, compared to countries which were very reluctant or late to introduce such reforms.* We use a classification developed by Pollitt and Bouckaert (2004), distinguishing between (in order of decreasing degree of radical reforms) minimizers and marketizers; early and later modernizers, and maintainers. In addition, they also characterized countries like Austria, Portugal, Japan and Korea as rather modest modernizers. Accordingly, countries are classified regarding their NPM reform trajectory as (1) marketizers, (2) early modernizers, (3) late modernizers, (4) rather modest modernizers, (5) maintainers.

Some macro-economic factors explaining cross-country variation

Whether and how national governments will adapt to internationally proclaimed ideal-type governmental support for PPPs is related to the macro-economic situation of a country. The **economy's level of development** and "wealth" might influence the demand for transport and other public infrastructure, influencing in turn market conditions and the incentives for the private sector to participate in PPP infrastructure projects. In highly developed countries an up to date and high-quality public infrastructures is required in order to maintain the good economic situation. Involvement in public infrastructure projects is deemed profitable by companies, as a large number of consumers are able to pay the market price for infrastructure related services. Government's role is to provide a sufficiently supporting institutional environment for such investments – the so-called "soft infrastructure" in term of: rule, regulation, laws, supporting arrangements, etc. – to enhance the development of PPPs.

In low-income economies the need for infrastructure investment might be even more pressing than in highly developed economies. In these countries not only governments' ability to fund infrastructure investment often is low and makes them try to attract private investors (Checerita, 2009) but also citizens' purchasing power is small allowing them to pay only moderate prices for infrastructure services. As private investors (have to) calculate the profitability of their infrastructure investment, revenue generated might be insufficient in relation to meet their profit expectations. So infrastructure demand backed by sufficient purchasing power matters for explaining the demand for PPPs as it raises expected investment returns, and hence attracts the private sector to participate (Hammami, et.al, 2006).

The level of economic well-being might trigger policy change as is emphasized in policy change and diffusion theories like the advocacy coalition theory (Sabatier 1988). Also in public management literature, macro-economic downturn is considered a major trigger for radical reform programs (Pollitt and Bouckaert, 2011; Wollmann, 2003), as was the case in the UK and New Zealand in the early eighties. Christensen and Laegreid consider the macro-economic situation of a country as a major

environmental condition which will mould the country-specific translation of internationally propagated policy ideas by the government of a country (Christensen and Laegreid, 2001).

Another dimension of the macro-economic situation determining the level of governmental support for PPPs might be the extent of **government debt**. One of the main reasons for government to engage in PPPs is the relaxation of the budget constraint through private financing (Checerita, 2009, McQuaid and Scherrer, 2010). Several authors point at the fiscal crisis in the public sector, and related to this, a search of governments for other sources of funding to finance infrastructure investments (Keating, 1997, Grimshaw et.al, 2002, Flinders, 2005). As long as public debt is not considered as high, government will lend on the capital market to finance their investments, as usually public lenders are granted lower interest rates than private lenders. But in countries with high levels of government debt, a lack of public funds for investments might cause governments to look for other forms of financing and to encourage the development of PPP-stimulating policies, regulations and supporting arrangements (Hall, 2008).

Interacting macro-economic and macro-institutional factors explaining cross-country variation

Of course, the abovementioned macro-economic and macro-institutional factors do not function in isolation from each other when influencing the incentive for governments to adopt internationally proclaimed ideas on PPP governmental support. It is their joint effect that matters. High levels of PPP governmental support refer to clear policies and political commitment to PPPs, a well-developed regulatory framework with respect to public procurement and PPP-specific legislation, and supporting arrangements including PPP-units, clear role allocation and instruments for project appraisal, and standardization of contracts and documents

Proposition 1: *Countries with a more centralized state structure, a high level of uncertainty avoiding societal culture, a more radical reform trajectory with respect to new public management, as well as a high level of GDP per capita or high government debt, or any combination of these conditions, will show a high level of PPP governmental support (P1)*

Proposition 2: *Countries with a less centralized state structure, a low level of uncertainty avoiding societal culture, a less radical reform trajectory with respect to new public management, as well as a low level of GDP per capita or a low level of government debt, or any combination of these conditions, will show a low level of PPP governmental support (P2)*

We will test to what extent these conditions solely and in combination can explain the variation in PPP governmental support in 20 European countries.

4.3 Data and Methodology

Data on governmental support was provided by AWG1 of the COST TU1001 Action on PPPs in transport (see for more details on the data, Verhoest et al., 2015, 2016 and 2013). This is done for twenty European countries which are characterized by a considerable variety of experience with PPP

and by different politico-administrative traditions and regimes including Nordic, Continental, Napoleonic-Latin, Central and East European countries, and UK as an Anglo-American country (see Painter & Peters 2010). More specifically, 18 countries are member states of the European Union, one country is closely affiliated to the EU (Switzerland), and one country has a legal framework which is consistent with EU-regulations in the field of PPP (Serbia). For reasons of data availability, data, generally, refer to the central government level with the exception of Belgium where Flanders taken as a proxy because in Belgium there is nearly no PPP activity outside Flanders. Due to limitations in data-gathering, though, we did not manage to include some important countries with regard to PPPs, like Ireland, Spain and Poland. The outcome in our analysis will be operationalized through the level of PPP governmental support encompassing: policy and political commitment, legal and regulatory framework and PPPs supporting arrangements (Verhoest et al. 2015).

Data was exploited using fuzzy-set Qualitative Comparative Analysis (fsQCA). There are three reasons why QCA is used. First, a fuzzy-set QCA is highly appropriate for analyzing small N cases or intermediate N cases. We argue that twenty cases (countries) with five conditions are sufficient to meet the basic requirement of benchmarks contradiction measure (Marx & Dusa, 2011). Second, a QCA allowing us to test hypotheses or existing theories, more specifically the researchers aim at operationalizing theory or hypothesis as explicitly as possible by defining a series of conditions that should yield a particular outcome (Rihoux & Ragin, 2009). In this chapter, we are mainly interested in analyzing how macro-institutional variables as well as economic conditions for particular countries combine in order to explain high or low level of PPP governmental support. Third, a crucial phase in QCA is the calibration procedure, in which cases are assigned to sets. According to Schneider & Wagemann (2007), both the so-called qualitative anchors (crisp set and fuzzy set) and the coding rules for assigning set memberships to cases must be made transparent and explicit. More specifically, the decision for allocation needs to be based on theoretical and empirical information, and not just on mathematical operations.

According to Yamasaki & Rihoux (2009), the selection method of condition can be conducted into 6 methods[21]. The comprehensive approach is adopted by collecting and analysing all possible factors having causal relationships with the level of governmental support for such countries. Taking into consideration the macro-institutional and macro-economic variables influencing the development of policies, regulations and supporting arrangements of PPPs (Pollitt & Bouckaert 2004: Verhoest et al. 2010), this logical framework is used to examines relevance as well as availability of data, whereas overall data variables and proxies provided by COST Action TU1001. It is necessary to test which variables or proxies can represent the outcome of interest. Second, the good practices for conducting Qualitative Comparative Analysis (QCA) also considered such as: (1) a condition must vary across cases, (2) keep the number of conditions relatively low, (3) a good balance between number of cases

[21] (1) The comprehensive approach, where the full array of possible factors are considered in an iterative process; (2) The perspective approach, where a set of conditions representing two or three theories are tested in the same model; (3) The significance approach, where the conditions are selected on the basis of statistical significance criteria; (4) The second look approach, where the researcher adds one or several conditions that are considered as important although dismissed in previous analysis; (5) The conjunctural approach, where conditions are selected on the basis of "theories that are conjuntural or combinatorial in construction and that predict multiple causal combinations for one outcome; and (6) The inductive approach, where conditions are mostly selected on the basis of case knowledge and not on existing theories.

and conditions for an intermediate-N analysis (10 to 40 cases) would be 4 to 6-7 conditions (Ragin & Rihoux, 2009). Therefore, the rationales of choices: variables, proxy and categories of conditions depicted in Table E.1 (Annex E). Also, five conditions selected based on the list macro-institutional variables as well as economic characteristics of the group (see table E.2 in annex E).

When conducting fs-QCA one should follow five steps[22] (Schneider and Wagemann, 2010; Rihoux and Ragin, 2009). The calibration of set membership is done using the indirect method as well as the direct method. Moreover, the threshold for the consistency ratio should be as close to 1.0 as is feasible or higher than 0.75, consequently, the consistency ratio, which is less than 0.75 should be dropped in minimization process. According to Rihoux & Ragin (2009), the consistency should be higher than 0.75 or a cutoff value of 0,80 or higher are recommended. In addition, the fs-QCA software serves three types of solution formula such as: complex, parsimonious and intermediate solutions. A complex solution is derived from the assumption that all remainders are set false, while a parsimonious solution exploit counter-factual analysis considering any remainders both easy and difficult counter-factual cases to generate a logically simpler solution. An intermediate solution has some advantages. First, it is in between the conservative and the most parsimonious solution in term of complexity. Second, an intermediate solution is a subset of the most parsimonious solution and a superset of the conservative solution (Schneider & Wagemann, 2013). We will present in this chapter the intermediate solutions but with signalling core and peripheral conditions, meaning the conditions which respectively are and are not mentioned in the parsimonious solutions. When peripheral conditions are not present in the parsimonious solution, but do appear in the intermediate one, meaning that they are more trivial as condition (Ragin & Fiss, 2008).

We apply fuzzy set Qualitative Comparative (fs-QCA) to establish the solution formula for the relationship between the outcome (PPP-GSI) and the conditions being the abovementioned five macro-institutional and macro-economic variables. As our measurement of the PPP GSI refers to data collected by April 2013, most conditions refer also to the same period. In fact, two of the macro-institutional variables, being societal culture and to a lesser extent, state structure, are quite stable over time. However, for the macro-economic conditions we use indicators which refer to a long period of time before this moment, being the period of 2000 till 2012.

The calibration of set membership scores

Calibration is a crucial step to conduct fuzzy set Qualitative Comparative Analysis (fs-QCA). The explanation of calibration for both an outcome and conditions presented below.

(1) Outcome - Level of PPP governmental support

The level of governmental support for PPP includes three dimensions: Policy & political commitment, PPP legal & regulatory framework and PPP supporting institutions. Item scores within these three dimensions are measured on an ordinal scale between 1 and 4 (see table 10, second column) with 4 representing the highest possible level and 1 representing the lowest possible level or no governmental

[22] It includes: (1) the selection of relevant conditions, (2) the calibration of set membership, (3) the construction of a truth table, (4) the minimization of consistent configuration to form solution formula, and (5) the application of solution formula.

support for PPP, and calculation of the average delivers a sub-index on policy and political support, a sub-index on the legal and regulatory framework, and a sub-index on PPP-supporting arrangements. These three subdimension scores have been used to calculate an unweighted index of PPP Governmental support (the PPP-GSI) allowing to rank countries (Verhoest et al. 2015). This unweighted index varies on the score between 1.2 (Estonia) and 3.0 (United Kingdom) (Verhoest et al., 2015) (see also table F1 annex F). However, in this chapter we will not use the unweighted PPP-GSI index as primary operationalization for the outcome, but rather use the results of the cluster analysis performed on the nine items of the three subdimensions as a starting point for our operationalization and calibration (Soecipto et al. 2016).

Grouping twenty European countries based on similarities and differences (Soecipto et al., 2016 cluster analysis yields four clusters (see table 10).

Table 10: Typology Group of countries (based on Soecipto et al. 2016)

Cluster	Countries in the cluster	Policies & political commitment	Legal & regulatory framework	PPP Supporting Arrangements
1 (highest)	The United Kingdom, Netherlands, Germany, Belgium-Flanders	High	Moderate	High
2	Portugal, Greece, France	Moderate	High	Moderate
3	Italy, Czech R., Switzerland, Slovak R, Denmark	Moderate	Moderate	Moderate
4 (lowest)	Serbia, Cyprus, Slovenia, Hungary, Finland, Austria, Sweden, Estonia	Low	Moderate	Low

Although not present in our sample of countries, there might be countries which score high or low on all dimensions. In order to allow for this possibility and to calibrate the level of governmental support as outcome, we add two clusters so that theoretically all countries could be captured in terms of governmental support toward PPPs. The first additional cluster would entail countries which score high on all three dimensions, and the second cluster would encompass countries which score low on all dimensions. Therefore, we identify six clusters: clusters 2,3,4 and 5 represent our country clusters as shown in table 2, cluster 1 represents potential countries which score high on all three dimensions and cluster 6 represents countries which score low on all three dimensions.

Hence, we calibrate the level of PPP Governmental support as an outcome into six categories and a six-value fsQCA as follows: (1) Cluster 1 scores 1 (fully in), (2) Cluster 2 scores 0.8 (mostly, but not fully in), (3) Cluster 3 scores 0.6 (more or less in), (4) Cluster 4 scores 0.4 (more or less out), (5) Cluster 5 scores 0.2 (mostly, but not fully out), and (6) Cluster 6 is allocated the value 0 (fully out). A robustness check using the PPP-GSI values for calibration (which is not shown here) yielded results very similar to our original analyses (see table F1 in the annex F)

For each of the three dimensions of governmental support cluster analyses resulted in the clusters as shown in table 11. When studying the different dimensions of outcome, we will link the four clusters for each dimension to six values for calibration in a similar way as we do for the overall level of governmental support (by adding a theoretical value of 1 and 0).

Table 11: Country clusters along the dimensions of governmental support for PPP (see Soecipto et al. 2016)

Dimensions of governmental support for PPP		
Policy & Political commitment	Legal & regulatory framework	PPP supporting arrangements
Cluster 1: "*Strong policy and political supporters*" 3 countries: NL, UK, DE	Cluster 1: "*Providers of comprehensive legal and regulatory support*" 3 countries: FR, GR, PT	Cluster 1:" *Providers of comprehensive PPP supporting arrangements*" 5 countries: FR, BE, NL, DE, UK
Cluster 2: "*Strong political supporters*" 3 countries: BE, PT, IT	Cluster 2: "*Providers of an intermediate level of legal and regulatory support*" 3 countries BE, RS, SI	Cluster 2: "*Strong providers of PPP supporting arrangements*" 1 country: PT
Cluster 3: "*Strategy developers providing modest political support*" 4 countries: CH, CZ, DK, SL	Cluster 3: "*Providers of legal and regulatory support with a clear focus on national procurement law*" 12 countries: DE, HU, AT, FL, SL, SE, UK, NL, IT, CY, CZ, CH	Cluster 3: "*Intermediate level providers of PPP supporting arrangements*" 10 countries: CH, CZ, DK, GR, IT, RS, SI, CY, SL, HU
Cluster 4: "*Modest policy and political supporters*" 10 countries: AT, EE, FR, GR, RS, SI, SE, CY, FL, HU	Cluster 4: "*Providers of limited legal and regulatory support*" 2 countries: DK, EE	Cluster 4: "*Providers of no or limited PPP supporting arrangements*" 4 countries: AT, EE, FL, SE

(2) State structure (dispersion of authority)

The condition of state structure generally classifies into four types: (1) centralized unitary, (2) decentralized unitary, (3) regionalized unitary, and (4) federal state structure (Committee of the Regions- EU, 2012; Pollitt & Bouckaert, 2011; Lijphart, 1999). We calibrate membership in four fuzzy-sets: 1 (fully in), 0.67 (more or less out), 0.33 (mostly but not fully out), and 0 (fully out).

(3) Uncertainty Avoidance Index (uncertainty avoidance) as measurement of risk averse societal cultures

Hofstedes' Uncertainty Avoidance Index refers to the level of risk aversion in society and the level of tolerance for uncertainty and ambiguity within the society. A high level of uncertainty avoidance is associated with a-rule oriented society that institutes laws, rules, regulations, and controls in order to reduce the amount of uncertainty (Hofstede, 2001).

Among the twenty European countries, Hofstede assigns the lowest uncertainty avoidance score to Denmark (23), and the highest one to Greece (112). We calibrate the Uncertainty Avoidance Index in a six-value fs-QCA as follows: (1) 1-20 with value 0 (fully out); (2) 21-40 getting value 0,2 (mostly, but not fully out); (3) 41-60 with value 0,4 (more or less out); (4) 61-80 being allocated value 0,6 (more or less in); (5) 81-100 receiving value 0,8 (mostly, but not fully in), and (6) 101-120 referring to value 1 (fully in).

(4) NPM Driven reforms

The condition which refers to the intensity of 'NPM-driven reforms' represents the trajectories of past administrative reforms in the twenty countries (Pollit & Bouckaert, 2004). We differentiate between 'radical reformers' encompassing marketizers, 'early modernizers', 'late modernizers', 'rather modest modernizers', and 'maintainers' which are calibrated into a five value fuzzy-set: 1 (fully in), 0.6 (more or less in), 0.4 (more or less out), 0.2 (mostly but not fully out), and 0 (fully out).

(5) GDP per capita as an indicator of economic development

GDP per capita is the most common indicator of a country's level of economic development. We use the average of GDP-per capita for twenty countries for the years from 2000 to 2012 provided by Eurostat (2013).We conduct "direct calibration" to cluster membership and set up three different measures[23]: (1) the 5% percentile or threshold for non-membership which is equal to 3,561 euro/capita/year, (2) the 50% percentile or cross-over (24,723 euro/capita/year), and (3) the 95% percentile or threshold for full-membership (75,300 euro/capita/year). This calibration renders the degree of membership on the range from 0.00 to 1.00.

(6) Government debt in per cent of GDP as a proxy for a state's financial status

We use the average of total government debt as percentage of GDP for the period 2000 to 2012 (the range of this variable is from 5.63 per cent to 117.75 per cent) in order to capture the impact of governments' financial status on the decision for (not-) using PPPs. Data are obtained from Eurostat (2013); data for Serbia and Switzerland are taken from www.tradingeconomics.com. Direct calibration is performed according to the following rule: (1) 5% percentile or threshold for non-membership=10%, (2) 50% percentile or cross-over=60%, and (3) 95% percentile or threshold for full-membership=110%.[24]

The results of calibration method of five conditions are depicted in table F2 in the annex F.

[23] The average GDP per capita 28 EU countries from 2000 to 2012 is €24,723/year/capita as cross over point. The highest average value belongs to Luxembourg (not our ountry sample) being € 75,300 and Serbia has the lowest GDP per capita (€ 3,561).

[24] The average percentage of government debt periods from 2000 to 2012 is 57,5%, however, referring to Maastricht Treaty stated that EU Member States should comply with budgetary discipline by respecting two criteria: a deficit to GDP ratio and a debt to GDP ratio not exceeding reference values of 3% and 60% respectively. Therefore, we use a debt to GDP ratio 60% as cross-over point.

4.4 Results Fuzzy-set Qualitative Comparative Analysis (fs QCA)[25]

Results I: explaining the level of governmental support for PPP

We set the consistency level of necessary conditions at **0.90,** i.e. the presence/absence of a condition is necessary when in at least 90% of cases the outcome is observed given the condition being present/absent. While consistency reflects the degree to which cases sharing a combination of conditions have the same outcome, coverage indicates how much of the outcome is explained by a condition (Ragin 2008).

Table 12 exhibits consistency levels and coverage levels (in brackets). Necessary conditions are present for neither a high nor a low level of PPP governmental support.

Table 12 Analysis of necessary conditions for the level of PPP Governmental support

Conditions	PPP Governmental Support	
	High	Low
More radical reformers	0.72 (0.78)	0.56 (0.80)
Less radical reformers	0.81 (0.58)	0.84 (0.80)
More centralized state government	0.74 (0.54)	0.77 (0.75)
Less centralized state government	0.66 (0.68)	0.53 (0.73)
High level of Uncertainty Avoidance Index	0.84 (0.63)	0.75 (0.75)
Low level of Uncertainty Avoidance Index	0.67 (0.67)	0.63 (0.84)
High level of GDP per capita	0.79 (0.67)	0.78 (0.83)
Low level of GDP per capita	0.80 (0.73)	0.55 (0.66)
High level of government debt	0.78 (0.78)	0.55 (0.73)
Low level of government debt	0.73 (0.55)	0.83 (0.83)

* indicates the necessary condition, which is above the threshold that we set (.90)

We now turn to the analyses of the sufficient conditions[26]. We include all truth tables of the analysis in Annex G1, G2, G3 and G4.

The analysis of the conditions for the presence of a 'high level of PPP governmental support' results in three solution formulas with rather high raw coverage levels; two of them refer to a parsimonious

[25] We employ the fsQCA 3.1 software. When it is compared to fsQCA 2.5, this software is considered more valuable in terms of the process as well as the results. In order to obtain the best solution formula and fulfil the transparency in reporting, we also conduct the analysis using other software (R-software 3.1.6)

[26] Several arguments substantiate the cut-off consistency ratio: (1) it is well above the lowest "permitted" value of 0,75; (2) the high PRI (Proportional Reduction in Inconsistency) scores (see Schneider and Wagemann, 2012) indicate a big difference between the configuration's consistency scores for positive outcome and negative outcome (the cut off 0,60 is considered high); (3) the cut-off point is substantiated by the examination of the cases covered by the configuration (Verweij, 2015 see also Ragin, 2009; Schneider and Wagemann, 2012).

solution (see table 13). Jointly, the three solution formulas represent a solution consistency of 0,93 and a solution coverage of 0,67 (which is rather high). The combined conditions 'more radical reformers' AND 'less centralized state structure' AND 'high level of GDP per-capita' are associated with a high level of PPP governmental support. The United Kingdom is fully explained by this solution path. Solution paths 2 represents the combined condition 'more centralized state' AND high level of GDP per capita' AND 'high level of government debt' as core condition, and this is combined with 'a "high level of uncertainty avoidance' as peripheral condition. France and Belgium-Flanders are fully explained by these solution paths.

Table 13: Analysis of the sufficient conditions: Solution formula of 'High level of governmental support'

	OUTCOME: presence High level of PPP Governmental support		**OUTCOME: absence High level of PPP Governmental support**		
Conditions/Solution terms	**Solution 1**	**Solution 2**	**Solution 1**	**Solution 2a**	**Solution 2b**
NPM driven reform					
More radical reformers	●				
Less radical reformers			●		●
State Structure					
More centralized state government	○	●			
Less centralized state government			○	○	○
Uncertainty Avoidance Index					
High Uncertainty Avoidance Index		●			
Low Uncertainty Avoidance Index				●	●
GDP per capita					
High GDP per-capita	●	●			
Low GDP per-capita			●	●	●
Government Debt					
High Government debt		●			
Low Government debt			●	●	
Consistency	0.95	0,94	0,94	0,94	0,97
Raw coverage	0.52	0,48	0,48	0,35	0,36
Unique coverage	0,19	0,14	0,15	0,04	0,05
Countries	The UK	France	Czech R	Estonia	Cyprus
		Belgium-Fl	Serbia		
			Slovenia		
Overall solution consistency	0.93		0,93		
Overall solution coverage	0.67		0,56		
N	20		20		

1) Black circle illustrates the presence of conditions, otherwise white circle indicates the absence of conditions. Large circle specify core conditions, and small ones, peripheral conditions. Blank spaces describe 'don't care' (Ragin & Fiss, 2008)
2) The table includes only the intermediate solution of configuration at level of consistency 0.85 to the outcome of interest.
3) Countries listed under a solution path are fully explained by the related solution path.

These results suggest that countries which develop high levels of governmental support mostly have high levels of GDP per capita and either a more radical administrative reform trajectory and a less centralized state OR a more centralized state and high level of uncertainty avoidance and high levels

of government debt. *The patterns we found support the first central propositions formulated in this chapter, P1 to a large extent more specifically referring to solution 2.*

As the outcome and its negation should be analysed separately (Schneider & Wagemann, 2007), the conditions for the absence of a 'high level of PPP governmental support' are scrutinized. The analysis yields four solution formulas (one of them being parsimonious); overall solution consistency and coverage are quite high with values of 0.93 and 0.56 respectively. First, the solution paths exhibit a parsimonious solution with conditions 'a more centralized state AND 'low levels of GDP' AND 'low levels of government debt as core conditions combined with less radical reformers (Czech Republic, Serbia and Slovenia). Second, a more centralized state AND low levels of uncertainty avoidance AND low levels of GDP combined with either 'low levels of government debt' (solution 2a) OR 'a less radical reformer (solution 2b) fully explain the low level of PPP governmental support in Estonia and Cyprus.

Thus, there are four conditions that explain the absence of a high level of PPP governmental support: a less radical administrative trajectory, low levels of GDP per capita, low levels of government debt and low levels of uncertainty avoidance, however a less centralized state seems to strongly deviate our proposition in some extent. *The patterns we found support in high extent the second central propositions formulated in this chapter or P2.*

In summary, the results indicate that the variation of PPP governmental support (presence or absence) across countries can be explained rather robustly through country characteristics (in different combinations).These are the levels of GDP per capita and government debt, the risk averseness of the societal culture (uncertainty avoidance), the radicalness of the administrative reform trajectory, and – by exception of The United Kingdom – case the centralization level of the state structure (polity).

The solution formula should be linked back to cases, preferably through graphical representation tools (Schneider & Wagemann, 2010; Goertz 2006). X-Y-plots display either entire solution formula and/or different paths towards the outcome, where single cases fall on the fuzzy scales of the outcome and (conjunctural) conditions. Second, X-Y-plots allow to assess the quality of fs-QCA as they show whether the specific sets of conditions are sufficient (i.e. cases shown in upper triangular plot) while cases shown in the lower-right corner violate the argument that the cause is a subset of the outcome (Schneider & Wagemann, 2010). We visualize the combination of conditions for both presence and absence of high PPP-GSI by XY- plots (figure H.1a and H.1b in ANNEX H). These figures point at three countries (i.e. the UK, Belgium-Flanders, France) for explaining high level of PPP-GSI as well as five countries (i.e. Czech, Slovakia, Slovenia, Cyprus and Estonia) as being typical cases included in the solution formula locating in the upper right cell all cases with more in than out in terms of both X (combination of conditions) and Y (outcome) (Schneider & Rohlfing, 2013). Otherwise, four countries (Germany, Netherlands, Greece and Portugal) on figure H.1a and eight countries (Denmark, Italy, Austria, Finland, Sweden, Slovakia, Switzerland and Hungary) on figure H.1b, fall in the upper left cell, which refers to irrelevant sufficient conditions (Goertz, 2006) or deviant cases for coverage (Schneider & Rohlfing, 2013), therefore, these cases are not included in the solution formula. However, we found one case (country) which is considered a deviant case in terms of consistency in degree or

inconsistent with a pattern of sufficiency, but does share qualitatively identical membership in X and Y with typical cases (Schneider & Rohlfing, 2013), being Czech Republic (on absence of outcome). This implies that the results concerning the sufficient set of conditions for explaining the outcome are not fully perfect.

RESULT II: Typology of 20 European countries: Explaining the variations of policies, regulations and supporting arrangements of PPPs by macro-economic and macro-institutional conditions

In this section we attempt to answer the question: which of the defined macro-institutional and macro-economic conditions lead to a high or low level of the three sub-dimensions of governmental support: **policies and political commitment for PPPs, PPP-enabling regulatory and legislative framework and supporting arrangements** in countries? Accordingly, this section elaborates more in-depth the causal relationship between the five selected conditions and these three outcomes.

The aims of this section are threefold. First of all, we will look at the extent to which of the two factors: macro-economic and macro-institutional conditions in combination explain the separate dimensions of policies, regulations and supporting arrangements. Second, we then extend the results of the fs-QCA analysis for groupings the combination of conditions by formulating typologies of country based on dimensions of PPP-GSI and their specific configurations. Finally, we compete the result of two different analyses (fs-QCA for PPP-GSI and each dimension) to see to what extent they correspond each other.

We then conduct the analysis of necessary conditions.

Table 14: Analysis of necessary conditions for a high and a low level of each Dimension of PPP GSI

Conditions	High level of Policy & Political Commitment		High level of Legal & Regulatory Framework		High level of Supporting Arrangements	
	Presence	Absence	Presence	Absence	Presence	Absence
More radical reformers	0.77 (0.75)	0.54 (0.83)	0.64 (0.75)	0.54 (0.83)	0.68 (0.80)	0.59 (0.78)
Less radical reformers	0.82 (0.53)	0.84 (0.85)	**0.94 (0.73)***	0.84 (0.85)	0.81 (0.63)	0.85 (0.75)
More centralized state government	0.70 (0.47)	0.78 (0.81)	0.81 (0.65)	0.78 (0.81)	0.75 (0.60)	0.77 (0.70)
Less centralized state government	0.72 (0.67)	0.49 (0.72)	0.59 (0.67)	0.49 (0.72)	0.63 (0.71)	0.56 (0.71)
High level of Uncertainty Avoidance Index	0.82 (0.56)	0.77 (0.83)	**0.96 (0.79)***	0.77 (0.83)	0.85 (0.70)	0.76 (0.70)
Low level of Uncertainty Avoidance Index	0.74 (0.67)	0.59 (0.84)	0.61 (0.67)	0.59 (0.84)	0.64 (0.70)	0.68 (0.84)
High level of GDP per capita	0.67 (0.50)	0.74 (0.85)	0.75 (0.67)	0.74 (0.85)	0.66 (0.59)	0.78 (0.78)
Low level of GDP per capita	0.80 (0.66)	0.56 (0.73)	0.80 (0.80)	0.56 (0.73)	0.75 (0.75)	0.59 (0.66)
High level of government debt	0.77 (0.70)	0.56 (0.79)	0.78 (0.85)	0.56 (0.79)	0.74 (0.81)	0.59 (0.73)
Low level of government debt	077 (0.53)	0.79 (0.84)	0.80 (0.66)	0.79 (0.84)	0.75 (0.62)	0.84 (0.78)

* indicates a necessary condition

Table 14 shows the consistency levels and coverage levels (between brackets). When using a consistency level of 0.90, our analyses show that a less radical reformers trajectory and high levels of uncertainty avoidance are necessary conditions for the presence of a high level of legal and regulatory framework in our country sample. So, in countries with a less radical reformers and high levels of uncertainty avoidance index, we will find high levels of legal and regulatory framework.

We now turn to the analysis of the sufficient conditions for both the presence and the absence of the outcomes of the different dimensions.

1.1. Policy and Political Commitment

Table 15 defines four clusters of countries depending on the extent to which governments in these countries express clear policies and political commitment in support of the development of PPPs. As detailed in Table 15 below, strong PPP-oriented policies and political commitment are found in countries with a more radical NPM-oriented administrative reform trajectory, a less centralized state structure and a high level of GDP per capita like the UK. The analysis results in a high overall solution consistency of 0,92 and a rather high overall solution coverage (0,56), meaning that 56% of the outcome 'high level of policy and political commitment' is explained by the found solution formulas. *This results partially support proposition 1.*

In contrast, the analysis of absence of low level policy and political commitment yields three intermediate solution formulas with an overall solution consistency with values of 0.87, and a high coverage (0.77). Countries with weak PPP-oriented policies and political commitment are found to have low levels of GDP per capita, less radical reform trajectories, low level of uncertainty avoidance in their societal culture, and low level of government debt (as core conditions) and a less centralized state structure (but the later condition is analysed pheriperal condition). From three solution paths, we point that the strongest path reflects on 8 countries (i.e. Serbia, Czech Republic, Portugal, Slovenia, Greece, Slovakia, Hungary and Cyprus) with a low GDP per capita combined and a less radical reform trajectory (solution 1). *These configurations confirm proposition 2 in high extent.*

As shown in figure H.2a and H.2b (ANNEX H), we visualize the combination of conditions for both presence and absence of PPP-enhancing policies and political commitment by XY- plots. These figures show one country (i.e. the UK) matching the solutions for the presence of PPP-enhancing policies and political commitment as well as nine countries (i.e. Czech Republic, Slovakia, Switzerland, Slovenia, Serbia, Cyprus, Greece, Hungary and Estonia) for the absence PPP-enhancing policies and political commitment. They are typical cases included in the solution formula locating in the upper right cell the area containing all cases with more in than out both X (combination of conditions) and Y (outcome) (Schneider & Rohlfing, 2013). However, five countries (Germany, Netherlands, Belgium, Italy and Portugal) on figure H.2a and six countries (Finland, Sweden, Austria, France and Denmark) on figure H.2b, fall in the upper left cell, which imply irrelevant sufficient conditions (Goertz, 2006) or deviant cases for coverage (Schneider & Rohlfing, 2013). Therefore, these cases did not fully match with the

solution formula. However, we found one case (country) which is considered a deviant case for/in terms of consistency in kind being Portugal (on the absence of outcome). This implies that the results regarding the sufficient set of conditions for explaining outcome are not fully perfect.

Table 15: Analysis of the sufficient conditions: Solution formula of presence and absence of 'high level of policy and political commitment'

OUTCOME:	**presence of 'high level of Policy & Political Commitment'**	**absence of 'high level of Policy & Political Commitment'**		
Conditions/Solution terms	**Solution 1**	**Solution 1a**	**Solution 1b**	**Solution 2**
NPM driven reform				
More radical reformers (REF)	●			
Less radical reformers (~REF)		•		●
State structure				
More centralized state structure (STATE)	○			
Less centralized state structure (~STATE)				•
Uncertainty Avoidance Index				
High Uncertainty Avoidance Index (UAI)				
Low Uncertainty Avoidance Index (~UAI)			●	•
GDP per capita				
High GDP per capita (GDP)	•			
Low GDP per capita (~GDP)		●	•	
Government debt				
High government debt (DEBT)				
Low government debt (~DEBT)			•	●
Consistency	0,92	0,88	0,95	0.91
Raw coverage	0,56	0,66	0,42	0.39
Unique coverage	0.56	0,35	0,11	0.09
Countries	The UK	Serbia	Estonia	Switzerland
		Czech Republic	Slovakia	Slovakia
		Portugal		
		Slovenia		
		Greece		
		Slovakia		
		Hungary		
		Cyprus		
Overall solution consistency	0.92	0.87		
Overall solution coverage	0.56	0.77		
N	20	20		

1) Black circle illustrates the presence of conditions, otherwise white circle indicates the absence of conditions. Large circles refers to core conditions, and small ones to peripheral conditions. Blank spaces describe 'don't care'
2) The table includes only the intermediate solution of configurations at the 0.85 level of consistency.
3) Countries listed under a solution path are fully explained by the related solution path.

1.2. Legal and Regulatory Framework

The analysis of the sufficient conditions for the **presence** of a 'high level of PPP-enabling legal and regulatory framework' in a country results in very high overall solution consistency of 0.95 and rather high coverage ratio 0.62. The extent to which countries develop a **PPP-enabling regulatory and legislative framework** seem, according to the analyses shown in Table 16, to be fostered by the combination of a high level of uncertainty avoidance, a more centralised state structure and a high level of government debt[27].

Table 16: Analysis of the sufficient conditions: Solution formula of presence and absence of 'high level of legal and regulatory framework'

OUTCOME:	**presence of 'high level of Legal & Regulatory Framework'**	**absence of 'high level of Legal & Regulatory Framework'**		
Conditions/Solution terms	**Solution 1**	**Solution 1**	**Solution 2a**	**Solution 2b**
NPM driven reform				
More radical reformers (REF)				
Less radical reformers (~REF)		●		●
State structure				
More centralized state structure (STATE)	●			
Less centralized state structure (~STATE)		●		
Uncertainty Avoidance Index				
High Uncertainty Avoidance Index (UAI)	●			
Low Uncertainty Avoidance Index (~UAI)			●	●
GDP per capita				
High GDP per capita (GDP)				
Low GDP per capita (~GDP)			●	●
Government debt				
High government debt (DEBT)	●			
Low government debt (~DEBT)				
Consistency	0.95	0,91	0.99	1.00
Raw coverage	0,62	0,56	0,70	0,52
Unique coverage	0,62	0,13	0,18	0,02
Countries	Greece	Austria	Denmark	Cyprus
	Portugal	Switzerland	Sweden	Slovakia
	France	Italy	Switzerland	
	Belgium-Fl	Slovakia	Estonia	
	Hungary	Germany	Finland	
			Slovakia	
			The UK	
			Netherlands	
Overall solution consistency	0.95	0.93		
Overall solution coverage	0.62	0.89		
N	20	20		

1) Black circle illustrates the presence of conditions, otherwise white circle indicates the absence of conditions. Large circles refers to core conditions, and small ones to peripheral conditions. Blank spaces describe 'don't care'
2) The table includes only the intermediate solution of configurations at the 0.85 level of consistency.
3) Countries listed under a solution path are fully explained by the related solution path.

[27] If comparing the necessity analysis (table 6) and the solution paths (table 8), we find that it is only a high level of uncertainty avoidance exists on solution formula. In most cases, the condition having a lower consistency ratio might be eliminated by Algorithm Quine-McCluskey. Accordingly, we did not find the solution path containing a less radical reformer.

This solution path includes Belgium-Flanders, France, Greece, Portugal and Hungary, which are countries classified as "*Providers of comprehensive legal and regulatory support*" (see table 3 and Soecipto, RM 2016). *This configuration mostly confirms with what we have formulated on proposition 1.*

The analysis for absence of a high legal and regulatory framework yields three intermediate solution formulas with very high overall solution consistency and coverage with values of 0.93 and 0.89 respectively. Countries which do not have strongly developed regulatory and legislative frameworks mostly show low levels of uncertainty avoidance or less centralised state structures combined with a less radical reform trajectory. The strongest path refers to countries with low level of uncertainty avoidance and low level of GDP per capita embracing on 8 countries (i.e. Denmark, Sweden, Switzerland, Estonia, Finland, Slovakia, The UK, and Netherlands). *This indicates that the configuration mostly supports proposition 2.*

As shown in figure H.3.a and H.3b (ANNEX H), there are five countries (i.e. France, Greece, Portugal, Belgium-Flanders and Hungary) fully matching the solution formula for presence of a more PPP-enabling legal and regulatory framework as well as 12 countries (i.e. Estonia, Denmark, Netherlands, the UK, Italy, Finland, Cyprus, Switzerland, Germany, Slovakia, Sweden, Austria) for matching the solution for the absence of such framework. Three countries are typical cases included in the solution formula locating in the upper right cell which is area containing all cases with more in than out on both X (combination of conditions) and Y (outcome) (Schneider & Rohlfing, 2013). However, these results are not fully perfect, as we find a deviant case in terms of consistency in kind being Hungary (in terms of presence of outcome) and Belgium-Flanders as well as Sweden and Austria as being deviant cases consistency in degree.

1.3. Supporting Arrangements

A third dimension of PPP governmental support refers to the extent to which government build up an extensive supporting arrangement for PPPs, consisting of a PPP unit, clear instruments and responsibilities for project appraisal and standardization of documents and processes. Table 17 shows the analysis of the sufficient conditions for the **presence** of a 'high level of supporting arrangement' in a country resulting a very high overall solution consistency of 0.96 and a coverage ratio of 0.63. A strong development of such supporting arrangement seems to be fostered by a high level of GDP per capita in combination with a more radical reformers trajectory and a less centralised state or a less centralized state. When turning to solution 2, we can conclude that the combination of a more centralized state AND high level of GDP per capita AND high level of government debt and high level of uncertainty avoidance *almost fully confirm proposition 1.*

Table 17: Analysis of the sufficient conditions: Solution formula of presence and absence of 'high level of PPP Supporting Arrangements

OUTCOME:	presence of 'high level of PPP supporting Arrangements'		absence of 'high level of PPP supporting Arrangements'		
Conditions/Solution terms	**Solution 1**	**Solution 2**	**Solution 1**	**Solution 2a**	**Solution 2b**
NPM driven reform					
More radical reformers (REF)	●				
Less radical reformers (~REF)				●	●
State structure					
More centralized state structure (STATE)	○	●			
Less centralized state structure (~STATE)					•
Uncertainty Avoidance Index					
High Uncertainty Avoidance Index (UAI)		•			
Low Uncertainty Avoidance Index (~UAI)			●	●	●
GDP per capita					
High GDP per capita (GDP)	•	●			
Low GDP per capita (~GDP)			●	•	
Government debt					
High government debt (DEBT)		●			
Low government debt (~DEBT)			•		•
Consistency	0,95	0.98	0,90	0.94	0.93
Raw coverage	0,48	0.46	0,47	0.49	0.35
Unique coverage	0,17	0.15	0,04	0.06	0.06
Countries	The UK	Belgium-Fl	Estonia	Slovakia	Switzerland
		France	Slovakia	Cyprus	Slovakia
Overall solution consistency	0.96		0,92		
Overall solution coverage	0.63		0,58		
N	20		20		

1) Black circle illustrates the presence of conditions, otherwise white circle indicates the absence of conditions. Large circles refers to core conditions, and small ones to peripheral conditions. Blank spaces describe 'don't care'
2) The table includes only the intermediate solution of configurations at the 0.85 level of consistency.
3) Countries listed under a solution path are fully explained by the related solution path.

The absence of a well-established PPP supporting arrangement, representing a consistency and coverage ratio of 0.92 and 0.58, is explained by two parsimonious solutions being low levels of uncertainty avoidance and low level of GDP as well as a less radical reform trajectory and low level of uncertainty avoidance. Three solution paths having a less centralized state and low levels of government debt seem to have only a peripheral to explain a low level of supporting arrangements. The strongest path represents the combination of low levels of GDP per capita and low levels of uncertainty avoidance and being a less radical reformer, with that path including two countries such Slovakia and Cyprus. *These configurations indicate the coherence of this results with what we have formulated on proposition 2.*

When visualizing the results with XY plots (see figure H.4a and H.4b), we found three countries (i.e. France, Belgium-Flanders and The UK) fully matching the solutions which explain the presence of a more well-established supporting arrangements. On the XY plot of absence of more well-established supporting arrangement, four countries (i.e. Estonia, Cyprus, Switzerland, and Slovakia) are in the upper right cell as they are typical cases.. No deviant cases consistency in kind exist.

4.5 Discussion

With respect to the individual dimensions of PPP governmental support, the macro-institutional and macro-economic conditions in different combinations enable us to explain many of the cases/countries in terms of PPP policies and political commitment, regulatory and legislative framework and PPP supporting arrangements and very much so in the way that the central propositions formulated their influence. Clearly, all conditions (i.e. NPM driven reformers, state structure, the level of uncertainty avoidance index, the level of GDP per capita and the level of government debt) have relevance in explaining the level of governmental support and its dimensions. The only one configuration which it is deviating to some extent from what we have formulated in the proposition refers to the case of the United Kingdom in terms of explaining the level of governmental support in general, the level of PPP-enhancing policies as well as the level of the supporting arrangements.

What can we learn from these analyses about the reasons why specific countries have specific kinds of governmental PPP support? Coherent with what we did on clustering distinctive group of countries with respect to the convergence and divergence of the governmental support for PPP across European countries (see Soecipto et al, 2016, see also chapter 3 in this dissertation), we have mapped the typologies of countries based on similarities and differences in terms of macro institutional variables and the level of each dimension of governmental support. The findings can be outlined on the following section below.

From table I.1 (ANNEX I), we can link the typology group of countries with the solution paths for explaining all outcomes, being policy and political commitment, legal and regulatory framework and supporting arrangements. **Group 1**, Belgium (Flanders) and France as 'Napoleonic countries' are countries with a more extensive PPP-enabling legal and regulatory framework and a more well-established supporting arrangements. This refers to the solution paths of countries having high levels of government debt, a high level of uncertainty avoidance and a more centralized state structure for explaining the more extensive PPP-enabling legal and regulatory framework and when these conditions are combined with high levels of GDP per capita, the path also explains the more well-established supporting arrangements in both Belgium and France.

Group 2 which refers to countries with a more extensive PPP-enabling legal and regulatory framework, but with weakly developed PPP-enhancing policies include Greece and Portugal. While high levels of government debt, high levels of uncertainty avoidance and a more centralized state structure explain robustly the more extensive PPP-enabling legal and regulatory framework in these two countries, the weakly developed PPP-enhancing policies is explained by the combined macro-

level conditions being, low levels of GDP per capita and a less radical NPM-driven reform strategy in these two countries.

Group 3, which refers to a group of countries with a low level of all dimensions of governmental support represents two countries Switzerland and Slovakia. The combination of a low level of government debt and a low level of uncertainty avoidance explain the weakly developed PPP-enhancing policies, PPP-enabling legal and regulatory framework, and the weakly developed supporting arrangements. In addition, these countries also entail a less centralized state structure as well as a less radical NPM-driven reform which cause weakly developed policy and political commitment as well as limited levels of supporting arrangements.

Group 4 represents countries with low levels of legal and regulatory framework, including the 'Scandinavian countries' (Denmark, Sweden and Finland) and Netherlands. This group refers to countries with a low level of uncertainty avoidance and low levels of government debt. **Group 5** refers to countries with a less radical NPM-driven reform trajectory and a less centralized state structure. Two 'Germanic countries' being Austria and Germany, besides Italy, belong to this group.

Finally, Group 6, a set of 'ex-Soviet countries' encompassing Czech Republic, Serbia and Slovenia and Hungary, represents weak policy and political commitment. This is explained by the presence of low levels of GDP per capita and less radical NPM-driven reform trajectories.

The rest of countries reflect countries with their specific patterns. The United Kingdom exhibits a country with an extensive governmental support for PPPs in terms of policy and political commitment as well as supporting arrangements. The position of the UK is explained by a combination of a more radical NPM-driven reform trajectory (marketizer), a less centralized state structure and high levels of GDP per capita. When we try to explain why the UK is reluctant to elaborate an extensive PPP-enabling legal framework, the solution found tells us that the UK has a low level of uncertainty avoidance as well as low levels of government debt. As one of the 'ex-Soviet countries', Estonia is considered to have very limited levels of all governmental PPP support dimensions. From the solution paths, we learn that Estonia generally has a low level of uncertainty avoidance, low levels of government debt and low levels of GDP per capita. Cyprus is a country with low levels on all governmental PPP support dimensions which can be understood when we see that it has a less radical NPM-driven reform strategy combined with low levels of GDP per capita.

4.6 Conclusion

The analysis presented in this chapter builds on previous work on comparative similarities and differences in governmental support for PPPs (see Verhoest, K et al., 2015; see chapter 2 in this dissertation). The chapter attempted to extend this research by linking governmental support for PPP with macro-institutional factors like polity (Lijphart, 1999; Hague and Harrop, 2007), culture and administration tradition (Hause, Hanges, Javidan, Dorfman and Gupta, 2004), and macroeconomic characteristics (e.g. Nolke and Vliegenthart, 2009; McQuaid and Scherrer, 2010). More specifically, we included in the study five explanatory variables including state structure, the level of NPM-inspired administrative reforms, uncertainty avoidance, the level of GDP per capita, and the level of government

debt. Having constructed the index of governmental PPP-support in the twenty countries, we analyse the relationships between macro-institutional and macro-economic characteristics and the degree of PPP governmental support. The empirical findings from the comparative analysis underpin the interpretation of governmental support for PPPs as a divergent rather than convergent policy phenomenon (Verhoest et al. 2015).

Our comparative analysis built on fs-QCA methods and showed that variation in PPP governmental support is explained quite robustly by country characteristics in term of macro-institutional and macro-economic and financial conditions. The different combinations of the level of GDP per capita, the level of government debt, the level of uncertainty avoidance and the administrative reform trajectory, and to a high extent also the state structure, are associated with presence or absence high PPP governmental support. We found a slight deviation in the United Kingdom, being a country with a more decentralized state structure, but with the most extensive governmental PPP support (mainly in terms of PPP-enhancing policies and supporting arrangements).

The analysis also shows that economic prosperity (measured as the level of GDP per capita) and the administrative reform trajectory (in different combinations) are important conditions for explaining the presence or absence of PPP-enhancing policies and political commitment. Moreover, the state structure, the level of uncertainty avoidance and to some extent the level of government debt (in different combinations) turned out to be important factors for explaining the presence or absence of a PPP enabling legal and regulatory framework. Finally, the different combinations of the level of uncertainty avoidance, the level of GDP per capita and the level of government debt were found to be important when explaining the presence or absence of PPP supporting arrangements.

The quality of fs-QCA analysis relates to not only an overall consistency and coverage ratio, but also to the accuracy of the configuration of explaining outcome. Hence, the XY plot is a necessary tool to ascertain the extent of accuracy of the fs-QCA results. We found that not all configurations are fully perfect, as some of the solutions still contain deviant cases consistency in degree and (somewhat) in kind. This is because we include the same conditions in four different analyses. Despite its shortcomings, however, this results can be considered quite robust in terms of some parameters: (1) consistency ratio about 0.87 (the lowest) and 0.96 (the highest); (2) coverage ratio approximately 0.56 (the lowest) and 0.89 (the highest); and (3) by exception of the UK in terms of state structure, all configurations fully confirm what we have formulated in the proposition. In addition, we have tested and solved the contradictory configuration (if any), so arguably the deviant consistency in kind did not come from this configuration.

Our findings also successfully unravel the typology of 20 European countries in terms of PPP-enhancing policies, regulations and supporting arrangements for explaining these outcomes. We distinguish the six groups of countries based on the similarities and differences of the configurations with the macro-economic and macro-institutional conditions. The results indicate that explaining the presence of outcomes (policies, regulations and supporting arrangements) is less straightforward than explaining the absence of these outcomes. Out of 20 countries, we can cluster them into six groups, but it still leaves three countries without a clear pattern, namely Estonia, The United Kingdom, and

Cyprus. A good example would be group 1 with well-developed PPP-enabling legal and regulatory frameworks and supporting arrangements, namely Belgium-Flanders and France, and for which the analysis shows that they generally have a more centralized state structure (when focussing on Flanders instead of Belgium), a high level of uncertainty avoidance and high levels of government debt. Interestingly, group 4 and 5, referring to countries in which the PPP-enabling legal and regulatory framework is weakly developed, are two typologies of countries with a low level of uncertainty avoidance, low levels of government debt as well as with a less radical NPM-driven reformer and less centralized state structure.

When evaluating the preliminary results and considering points for further research, various factors could be taken into account. First, the index of PPP governmental support is essentially a 'static measure' referring to data collected by April 2013. On the other hand, the variables measuring the level of uncertainty avoidance index and state structure are rather stable over time whereas two of our variables (the level of GDP per capita and the level of government debt) vary across time. Therefore, our findings depend on the development of both PPP governmental support and changes in these conditions over time. In future research one may scrutinize the implications of static and dynamic measurements of variables in more depth. Another venue of research would be to link macro-institutional/economic background variables with actual uptake of PPP projects in the twenty countries and using governmental PPP-support as intermediating variable. PPP research is increasingly turning comparative and further comparative analyses are currently being planned.

Section 3

The Effect of Variations of PPP Governmental Support across European Countries for Enhancing PPPs

Chapter 5

Contract Stability in European road infrastructure PPPs: How does governmental PPP support contribute in preventing contract renegotiation?

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5.1 Introduction

Public private partnerships (PPPs) as an alternative funding for infrastructure development has become increasingly popular across the world. As a typical PPP contract is long-term, complex and inherently incomplete, the potential for contract renegotiation is always present. The literature on explaining PPP contract renegotiation is expanding with both quantitative and qualitative studies, resulting in relevant determinants at very different levels (e.g. Cruz & Marques 2013a; Mladenovic et al. 2013; Markovsek et al. 2014; Guasch et al. 2014; Sarmento & Renneboog, 2016). Basically, these factors can be situated at three mutually influencing levels: (1) the overall institutional, political, macro-economic and financial context in a country, which we will refer to as macro-level business environment; (2) the specific arrangements and frameworks which a government uses to support PPPs (meso-level); and (3) project- and contract-specific factors (micro-level).

However, this literature suffers from three main shortcomings, which this chapter aims to address. First, most contract renegotiation studies, and in particular, the ones using quantitative studies, consider factors at these different levels to have independent effects on contract renegotiation. However, the different levels might be nested, meaning that factors at one level (e.g. macro or meso) may influence factors at another level (e.g. micro). Moreover, these factors may combine in specific ways when inducing contract instability. Therefore, this chapter aim to shed more light on these combined effects by applying configurational analysis (qualitative comparative analysis [fsQCA]).

Second, the effect of the meso-level factors in terms of governmental PPP support remains largely understudied. However, international organisations and consultancy firms have voiced explicit normative ideas about how governments should enhance PPP take-up, quality and performance in their infrastructure sectors (EIB 2011, EPEC 2011, the World Bank 2006). Following the conceptualisation by Verhoest, Petersen, Scherrer and Soecipto (2015), this internationally propagated ideal-type of *governmental PPP support* entails three mutually reinforcing dimensions: (a) affirmative policies and political commitment regarding PPP; (b) a well-developed regulatory framework with respect to public procurement procedures and PPP-specific legislation; and (c) PPP-specific supporting arrangements (like PPP-units, ex-ante evaluation instrument and standardization) (see also Jooste, Levitt and Scott 2011; Matos Castano et al. 2014). Indeed, empirical studies show that the success of PPPs is indeed affected by how much support is provided by government (Azis, 2007; Jacobson & Choi, 2008). The contribution of the governmental PPP support scheme to the contract stability of PPPs has not been studied as such (except for very specific elements, like PPP units, see Domingues and Sarmento 2016).

Third, studies on contract renegotiations have mainly focuses on Latin-American cases or on individual European states like Portugal and France. By studying twenty-five road infrastructure PPPs in ten European countries, this study expands the comparative knowledge regarding European practices.

In order to fill these gaps, the purpose of this chapter is to investigate *how governmental PPP support (meso-level) affects contract stability in PPPs in European countries, how it combines with the macro-level business environment, and factors at the project level (micro-level).*

5.2 Conceptualizing contract renegotiation and contract stability

Contract renegotiation is understood as re-opening the contract and making changes to its provisions in terms of, for example, risk assignment, conditions, and project scope (Markovsek, Hesselgren, and Perkins, 2015; Guasch et al, 2014). In line with Guash et al. (2014) and Domingues and Sarmento (2016: 82) a contract renegotiation involves 'a change in the original contractual terms and conditions, *as opposed to an adjustment that takes place under a mechanism defined in the contract'*. Original contracts might establish specific conditions for changes based on forecasts, such as traffic volumes, allowing for modifications e.g. in output specifications or re-financing (Domingues and Zlatkovic 2014). However, contract renegotiation in this chapter is about making changes to contractual terms *beyond* changes that are permitted under the original contract (Domingues and Zlatkovic 2014). The extent to which PPP contracts are renegotiated should not be underestimated. Studies point at rates of occurrences between 40 per cent and 75 per cent (Sarmento & Renneboog 2016; Guasch et al. 2014).

In the perspective of relational contracting, flexibility in dealing with long term contracts may provide the ability to better cope with unforeseen events (Guash and Straub 2006). However, Domingues and Zlatkovic (2014) highlight that flexibility is more likely to contribute to the project's success when implemented *in* the contract design, whereas contract renegotiation refers to flexibility *beyond* the original contract. The possibility of such contract renegotiation is considered in most literature to have mainly negative impacts. First, it weakens the incentives of the private contractor to perform. Second, it may create serious distortions at tender stage, stimulating to bidders to act strategically (Iossa, 2014) and bid aggressively, as they might expect that the contract will be renegotiated ex post anyway, so that they can recoup their profit margin. Moreover, transaction costs generated by contract renegotiations are high and they eliminate the effect of competition (Domingues and Sarmento 2016). Moreover, Guasch et al. (2014) state that 'renegotiations on average have been by and large the critical problem facing PPP'. There is some evidence of contract renegotiations resulting in benefits for users and governments, but these are generally considered to be rare, and very demanding in terms of information, expertise and trust for the contracting authorities involved (see e.g. Guash et al. 2014, Domingues and Zlatkovik 2014). Mostly they result in 'improvement in terms of the operator and/or investors, reduction of efficiency, reduction of quality for users and adverse fiscal impact, including increases in direct and contingent liabilities' (Guasch et al. 2014: 12; Sarmento and Renneboog 2014).

Hence it is crucial to understand the factors triggering contract renegotiation or, oppositely framed, the factors enhancing contract stability in PPPs. In the context of this chapter, contract stability is defined in terms of PPPs not experiencing a renegotiation of the initially concluded contract between the public contracting authority and the private consortium. The chapter proceeds by theorizing the contribution of macro-, meso- and micro-level factors to contract stability. Subsequently, the case selection, methodology and data are described. In the result section of the chapter, the findings of the fsQCA are reported, which are subsequently discussed.

5.3 Macro-, meso- and micro-level drivers for contract stability

The arguments in this section regarding the most crucial factors at macro-, meso- and micro level will allow us to formulate directional expectations which we use in the FsQCA analyses. One particularity is that for fsQCA the number of factors that we can only include six factors, given the number of projects in our sample (twenty-five projects, see Marx and Dusa 2011). As our analyses should also allow studying how factors across levels combine when affecting contract stability, we select rather comprehensive composite factors at the macro- and meso- level, which aggregate several underlying factors mentioned in the literature. The meso-level factor, governmental PPP support, as our main factor of interest, is however broken down further into its subdimensions in the second analysis in this chapter.

Macro-level business environment

Research has shown that the macro-level business environment in a country influences private sector involvement in infrastructure provision and the take-up of PPPs (Mota & Moreira 2015; Galilea & Medda 2010). However, it also affects whether PPP contracts remain stable after conclusion and contract renegotiation is avoided (Mladenovic et al. 2013). The macro-level *business environment in a country is defined as* the climate or set of conditions - economic, social, political, and institutional- in which business operations are conducted (Weimer 1970; Kaplan and Norton 2000). It refers to factors that are external to private companies beyond their control and similar for all companies in a country, encompassing both the macro-institutional, political, economic-financial and technological environment, as well as to more sectoral policies, such as labour market policy and innovation policy. The nature of the business environment is aggregative as several interdependent, dynamic elements jointly influence business decisions in a specific country or region (Weimer 1970; Kaplan and Norton 2000). In line with Markovsek, Hesselgren and Perkins (2014) we argue that this macro-level context and its contribution to contract stability should be analysed comprehensively. In search for an aggregate concept which would enable to capture this general business environment in a certain country, we suggest to use the concept of *national competitiveness*, as defined by Schwab and Sala-i-Martin (2014: 3) as 'the set of institutions, policies, and factors that determine the level of productivity of a country', as well as the return on investments rate and economic growth. Hence, one might expect that when road infrastructure PPPs are located in countries with relatively high levels of national competitiveness, this will contribute to their contract stability.

Literature provides strong support for this importance of a favourable macro-level business environment. A high quality institutional and political environment makes the initial allocation of risk and the way challenges to a PPP contract are handled predictable (Markovsek et al. 2014). Literature refers to the quality of the legal and judicial system (rule of law, regulatory quality, predictability and transparency of contract enforcement), low levels of corruption, government efficiency and bureaucratic quality (Guash, Laffont and Straub, 2008; Dominques and Sarmento 2016) as well as political and social stability (Iossa, Spagnolo and Sarmento 2007; Montecinos & Saavedra 2011; Sarmento 2014; Dominques and Sarmento 2016). Also, the macro-economic and financial situation of a country is crucial, as a downturn might trigger contract instability of PPPs, because if demand and traffic risks may become unbearable, the costs of privately-financed infrastructure projects may

increase (Iossa, Spagnolo and Vellexz, 2007; Cruz and Marques 2013a; Markovsek, Hesselgren and Perkins 2015). Literature points at GDP decline (e.g. Guash and Straub 2009, Montecinos & Saavedra 2011, but see Sarmento 2014), higher levels of public debt and budget deficit (Domingues and Sarmento 2016; Guash et al2008), as well as increasing exchange rates and interest rates (Montecinos and Saavedra 2011; Estache, Guasch and Trujilo, 2003).

Meso-level factors related to the governmental PPP support

The internationally propagated ideal-type governmental PPP support that a government should develop in order to stimulate and strengthen PPPs refers to a mutually reinforcing set of policies, regulatory frameworks and supporting arrangements. However, governments have adopted such schemes to in a very differentiated way (see Verhoest et al. 2015). Table 18 presents the different components of an ideal-type governmental PPP support scheme and provides an explanation why each element may be expected to enhance contract stability.

Literature on contract renegotiation has examined several of the above elements but in a rather fragmented way. We argue that one should study this governmental PPP support in its entirety. We expect that when road infrastructure PPPs are located in countries with relatively well-developed governmental PPP support in terms of PPP-enhancing policies and political commitment, legal and regulatory frameworks and supporting arrangements, this will contribute to their contract stability.

Micro-level factors related to contract-specific features

We focus on four factors related to contract design and management, which are frequently mentioned in both qualitative and quantitative studies.

Secureness of the remuneration scheme

The remuneration scheme or payment mechanism represents the various income sources with their assessed risk and potential cost coverage, or with other words their secureness (i.e. user charges, shadow toll, availability payment etc.) (Roumboutsos et al. 2015). PPPs will have a higher probability of contract renegotiation when featuring more uncertain and unpredictable revenue streams, with revenue being dependent upon demand and traffic flows (e.g. toll charges) and being paid by users instead of by public actors (Iossa, Spagnolo and Vellez, 2007; Cruz & Marques, 2013a). We expect that when transport infrastructure PPPs have a relatively secure remuneration scheme e.g. based on availability payments by public actors, this will contribute to their contract stability (Sarmento, 2014).

Appropriateness of risk allocation

Appropriate risk allocation between the public and the private partner is crucial for successful PPP projects, as it should provide incentives to deliver in time and budget, reduce long-term costs and improve quality of services (Iossa, Spagnolo, and Vellez, 2007; Mota & Moreira 2015). However, empirical studies show that risk misallocation is an important factor inducing contract renegotiation

(Estache, Guasch and Trujilo, 2003; Guasch et al. 2014), (a) in case the private partner assumes all risk, and an adverse economic-financial context or other reasons causes financial problems for the PPP, and (b) when the risk are allocated or shared on the basis of a too rigid set of constraints (i.e. traffic bands' definition of upper and lower limits or caps in interest rates) (Cruz & Marques 2013a). We expect that when road infrastructure PPPs have a relatively more appropriate risk allocation (in line with standard risk allocation schemes), this will contribute to their contract stability.

Short contract duration

Based on contract theory, long-term contracts will more often tend to lead to contract renegotiation, due to uncertainties and difficulties in such forecasts, particularly as far as traffic demand is concerned, and due to contractual provisions that are ill-suited for changing contexts over extended periods (Cruz & Marques, 2013a; Guasch, 2004; Cruz & Marques 2013b; Domingues & Sarmento 2016).

Young project age

Empirical studies on contract stability of PPPs face the problem that most of the studied projects are still ongoing, simply because most PPP projects have long contract duration. However, studies do not take the project age into account, i.e. the time between contract closure and the moment of measurement, when explaining the occurrence of contract renegotiation. Projects that have been ongoing for a long period are more likely to have faced one or more contract renegotiations than projects that started only recently, merely because of the longer time span that has passed. We expect that a limited project age will contribute to contract stability.

Table 18: Key dimensions and indicators of governmental PPP-support and their relevance for contract stability (Based on Verhoest et al. 2015)

Dimension	Indicators	Sub-indicators	Contribution to contract stability of PPPs (reducing occurrence of contract renegotiation)
Policy and political commitment	Existence of strategy document formulating an explicit PPP policy	Existence, time of issuing and frequency of updates	A clear PPP strategy, programme and political support that is stable over time brings clear prospects of future PPP for private partners and reduces the incidence of contract renegotiation, because of the likelihood of repeated business reducing motives for opportunistic behavior (Cruz & Marques 2013a) and because of improved relations between interested sectors and government actors (Ho & Tsui 2009, Sarmento 2014).
	Existence of a general PPP programme (incl. time schedule)	Existence, time of issuing and frequency of updates	
	Political support for PPPs	Level and evolution over time	
Legal and regulatory framework	Specific PPP or concession law: (a) existence	(1) General PPP or concession law; (2) PPP law in transport;	A better PPP legal and regulatory framework helps governments to reduce uncertainty and asymmetric information (by

		(3) procurement law; (4) in-line with EU	reducing public sector difficulties in assessing PPPs, thus leading to a better-negotiating position for the public sector (Domingues & Sarmento 2016, Guasch et al. 2014).
	Specific PPP or concession law: (b) scope regarding definitions of four items	Definition of (1) PPP; (2) eligible sectors and types of infrastructures/ services; (3) contracting authorities; (4) eligible private party	
	Elements provided in the general legal framework (including public procurement law)	four sub-indicators covering procedures and recommendations, 5 sub-indicators about mandatory provisions in PPP contract	
PPP-supporting arrangements	Acting public institutions/PPP-supporting units	Existence of a PPP support unit and time	The existence of a PPP unit, as strong regulatory body, improves the ability to deal with PPP complexity and supervision of ex-ante evaluation, tendering and award process, as well as contract design and management (Domingues & Sarmento 2016; Cruz & Marques 2013a; Montecinos & Saavedra 2011; Ho & Tsui 2009; Estache et al, 2009; Guasch, Laffont and Straub, 2008).
		Legal and organizational basis of PPP support unit	
		General functions PPP support unit (Dissemination, policy function and green lighting)	
		Staff size of unit	
	Procedures for PPP project appraisal and prioritisation, role of main sectors in project stages	Existence of standard ex ante evaluation instruments	The use of standard ex-ante evaluation instruments improve the accurateness of PPP-assessment and of traffic volume estimations and avoid biases (Cruz and Marques 2013a; Cruz dan Marques, 2013b; Nikolaidis and Roumboutsos 2013).
		Use of standard ex-ante evaluation in PPP projects	
		Existence of a third party scrutinizing and approving PPP projects before project on tender	

		Existence of a third party scrutinising and approving PPP projects before final contract signed	
	Standardised processes and documents for PPPs in transport	Use of standardised contracts for PPP in transport	Standardized contracts rely on tested and optimized contractual practices which reduces the chances of contract renegotiation.
		Use of standardised PPP model in transport	

5.4 Data and Methodology

5.4.1 Case-selection and data

This chapter seeks to explain contract stability among a sample of PPP projects in road infrastructure within ten European countries, using FsQCA. In studies using QCA methodology, cases are carefully chosen so as to maximize diversity on factors of interest and to minimize variation on contextual conditions (Yamasaki & Rihoux 2009). The sample includes countries representing a considerable variation, both in levels of country competitiveness (Schwab, 2014) and governmental PPP support (Verhoest et.al. 2015); the UK, the Netherlands, Belgium, Spain, Portugal, Greece, Italy, France, Norway and Finland. Also, selected PPP Projects should vary regarding remuneration scheme, contract duration and risk allocation scheme. The variation on contextual conditions was minimized by focusing on road infrastructure PPPs, instead of transport infrastructure PPPs in general, and by only including cases from countries from the EU or the EEA (Norway), as EU membership also brings more similarities e.g. in terms of public procurement and contract legislation.

Data were collected on 74 transport infrastructure projects by country teams in the COST Action TU 1001 and within the H2020 project BENEFIT, by means of desk research and in most cases by interviews with practitioners within the involved public contract authorities. Within the subset of forty-two PPP transport infrastructure projects, twenty projects in ten European countries were road projects of which thirteen were renegotiated (for more details on the selected projects see Table S1 in the Suplemental online information).

5.4.2 Methodology

We use a fsQCA in order to study whether governmental PPP support might have a conjunctural effect in combination with other conditions. The method allows to study which (set of) conditions are necessary and sufficient to bring about a certain outcome (Rihoux & Ragin, 2009). The assessment of causal complexity in set-theoretic methods is based on the assumptions of conjunctural causation – a condition only has an effect in combination with other conditions-, equifinality – multiple, mutually non-exclusive paths lead to the same outcome - and causal asymmetry – the presence of an outcome

may have other explanations than its absence. Fuzzy-set QCA is highly appropriate for analysing medium N cases (12 to 70 cases).

The interpretation of the results is mainly based on the consistency and coverage values indicated in the solutions. Consistency shows the extent to which the involved solution path is consistent to reality or in other words the extent to which this solution path leads to the outcome. Coverage, by contrast, assesses the degree to which a cause or causal combination accounts for an outcome. Hence, coverage reports the proportion of membership in the outcome explained by the overall solution term, indicating the percentage of the cases covered.

Several methodological choices were made. First, the threshold for the consistency ratio is set on no less than 0.80 (Rihoux & Ragin, 2009) and frequency cut-off is 1. Second, while the fsQCA software (fsQCA 2.5) delivers three types of solution formula (complex, parsimonious and intermediate), we apply the intermediate solution, which is in between the conservative and the most parsimonious solution in terms of complexity (Ragin, 2008). The correctness of the intermediate solution depends strongly on the quality of the counterfactuals or simplifying assumptions employed in the minimization process to deal with the limited diversity. If such simplifying assumptions are solidly grounded. Ragin suggests (Rihoux & Ragin 2009: 118), the intermediate solution is recommended as the main point of reference for interpreting QCA results. The arguments in the theoretical sector allow us to formulate directional expectations, which we use as simplifying assumptions in the fsQCA minimization process. We are careful to include olny simplifying assumptions that are built on substantive empirical or theoretical knowledge, giving a clear notion of how a condition contributes to the outcome (see the notion of 'easy counterfactual', Ragin and Sonnett, 2005). In our analyses the use of the intermediate solutions mainly reduced complexity relating to the presence of the outcome (contract stability). The tables also show the parsimonious solutions. We also checked the results by re-conducting the analyses using R-software.

5.4.3 Operationalization and calibration

This section explains how each factor was operationalized and measured, and how values were assigned in the calibration process. The calibration of sets of membership should be based on theoretical and empirical studies (Rihoux & Ragin, 2009). Table S1 in the supplemental online information shows all calibration values for outcome and condition.

Contract stability as outcome

Contract stability is the absence of contract renegotiation. The calibration of contract stability includes a time perspective, based on the following theoretical considerations. First, as PPP contract is by definition incomplete, contracts that have been running for a longer time have inherently more likely to be in need for renegotiation. Second, a contract renegotiation occurring soon after contract closure indicates serious distortions in the contract, not only in terms of the difficulties of adapting to changes in external environments, but also in terms of inherent shortcomings of the contract design (Guasch et al. 2014). Empirical studies show that the incidence of contract renegotiation happens on average around 3 years or sooner after contract award (Engel, Fischer, and Galetovic, 2014; Glifford, Bolanos,

and Daito, 2014; Sarmento 2014; Bitran et al. 2013; Guasch, Laffont, and Straub, 2008). Hence, we calibrated the 'contract stability' outcome into three values: (1) the occurrence of contract renegotiation within less than 3 years after contract closure = 0 (full out), (2) within 3 years or more = 0.4 (more or less out), (3) no contract renegotiation during the projects life span= 1 (fully in).

Conditions

(1) Country competitiveness (COMP) as measurement of macro-level business environment

Being a proxy of the macro-level business environment in a certain country, we used the Global Competitiveness Index (GCI) developed by the World Economic Forum (Schwab, 2014), which is available for every year since 1997 onwards and has been used by academics and practitioners (see e.g. Pérez-Moreno, Rodrigues, and Luque, 2016). The GCI includes a macro-economic pillar, capturing government budget balance, inflation, general government debt and the country credit rating, as well as a financial market development pillar, measuring among others the availability and affordability of financial services, soundness of banks, and venture capital availability. But this index also includes information on the institutional-political context, with proxies for rule of law, corruption, and government efficiency, among others. Furthermore, it refers to contextual elements and policies, supporting investments and economic activity, such as labor market efficiency, technological readiness, health and education, market size, business sophistication and innovation in a country. This GCI encompasses twelve pillars and is calculated based on a weighted average of sub-indicators. Just like other composite global governance indicators, the GCI has been criticized in terms of methodology and underlying theoretical model (see e.g. Lall 2001) which have not been fully dealt with in later refinements. However, its comprehensiveness and availability are assets in this chapter.

We calculated the country competitiveness based on two events. When projects were subject to contract renegotiation, the country's GCI is measured by taking an average the value at the moment of contract closure and the value at the moment contract renegotiation took place. In the case of no contract renegotiation, we used the average value from the value at the moment of contract closure and the moment of evaluation by BENEFIT. This single value (1 to 7) is then normalized to a total score on a scale between 0 and 1.

To assign set membership for the fsQCA, we used direct calibration. Based on a review of the GCI score in the 10 European countries from 2001 to 2014, we found an average around 0,60 and the lowest and the highest score are 0,40 and 0,80 respectively. We then set the following thresholds: 5 per cent percentile being the threshold for non- membership=0,40; 50 per cent percentile being the cross over point= 0,60 and 95% per cent percentile being the threshold for full membership= 0,80.

(2) Governmental PPP support (PPPGS)

The governmental PPP support is measured, following Verhoest et al. (2015), by sub-indicators related to three dimensions, namely PPP-enhancing policies and political commitment, PPP-enabling legal and regulatory frameworks and supporting institutional arrangements. The value of the sub-indicators varies between 1 (the lowest) and 4 (the highest). The data on governmental PPP support per country

as used in this chapter were collected by country teams as part of the BENEFIT case template per project at the moment of contract closure. Second, the data were then validated by cross-checking them with other sources such as the COST Action TU1001 country templates and narratives, as well as data from EPEC and EBRD. We also applied an alternative procedure by using the 2013 value as a benchmark (see Verhoest et al. 2015) and tracing changes in the years before up to the moment of contract renegotiation. In order to avoid the construction of a single composite index and related problems of aggregating ordinal values and arbitrary weighting decisions (Nardo et al. 2015), we performed hierarchical cluster analysis on the set of sub-indicators, resulting in six clusters ranked from low to high (see Soecipto et al. 2016). Hence, we calibrated 'Governmental PPP Support' as condition into a six-value set membership as follows: (1) Cluster 1 scored 1 (fully in), (2) Cluster 2 scored 0.8 (mostly, but not fully in), (3) Cluster 3 scored 0.6 (more or less in), (4) Cluster 4 scored 0.4 (more or less out), (5) Cluster 5 scored 0.2 (mostly, but not fully out), and (6) Cluster 6 with the value 0 (fully out). For the second analysis, in which we studied the influence of the three sub-dimensions of governmental PPP support, we also applied hierarchical cluster analysis to these sub-dimensions and calibrated them in a similar way.

(3) Appropriateness of risk allocation (RISK)

During data collection in the BENEFIT project, country teams mapped the actual allocation of risks for each transport infrastructure PPP to the public partner, private partner or shared between both, taking five major risks into account: design, construction, financial, regulatory and force majeure risks. The 'appropriateness of risk allocation' was measured by the conformity of the actual risk allocation with the standard risk allocation, taking the type of project into account (BOT vs DBFO/M), as suggested by literature and empirical studies (Iossa, Spagnolo, and Vellez, 2007; Bing et al. 2005; OECD 2008; Ke Wang and Chan, 2010). Hence, the appropriateness of risk allocation did not measure whether such risk allocation improved the social welfare or financial project stability. In case of Build-Operate-Transfer contracts, a standard risk allocation would retain most risks with the public partner, but the private partner should bear the construction risk (Iossa, Spagnolo, and Vellez, 2007). Conversely in case of Design-Build-Finance-Operate/Manage contracts, most risks would by default born by the private partner, but regulatory risk should be retained by the public partner. Moreover, financial and force majeure risk should be shared (Iossa, Spagnolo, and Vellez, 2007). The higher the number of risks for which the actual risk allocation in a specific project matches the standard risk allocation for those risks as suggested by Iossa, Spagnolo and Vellez (2007), the higher the calibrated value, we assigned to the condition: (1) 'all risks are appropriately allocated' scored 1,00 (fully in) (2) '4 out of 5 risks are appropriately allocated' scored 0,8 (mostly but not fully in), (3) '3 out of 5 risks are appropriately allocated' scored 0,6 (more or less in), (4) '2 out of 5 risks are appropriately allocated' scores 0,4 (more or less out), (5) 'only 1 of 5 risks is appropriately allocated' scored 0,2 (mostly but not fully out), and (6) 'no risk is appropriately allocated' scored 0,0 (fully out).

(4) Remuneration scheme (REM)

The remuneration scheme illuminates to how and by whom the partner responsible for the investment and/or operation in the infrastructure is paid. Both the remuneration method (availability- based or usage-based payment) and the nature of the funding agents (public actor versus end users) determine

whether a remuneration scheme is more or less secure (i.e. with a low risk profile) for the private partner (Perkins 2013; Roumboutsos and Pantelias, 2015). The remuneration schemes was classified and calibrated into six values, in order of decreasing certainty : 1) availability-based payment scored 1,00 (fully in), (2) fixed subsidy scored 0,8 (mostly but not fully in), (3) quality-based payment scored 0,6 (more or less in), (4) usage-based payment (user charges/toll charges) funded by government as shadow toll scored 0,4 (more or less out), (5) usage-based payment with mixed funding from public partner and end users scored 0,2 (mostly but not fully out), and (6) usage-based payment (user charges/toll charges) funded by end users scores 0,00 (fully out).

(5) Short contract duration (SHORT)

The 717 PPP projects in the United of Kingdom contracted until March 2012 indicate that contract duration ranges between 10 and 50 years with 26 years as average (HM Treasury 2012). In our sample, several of the projects from UK, Greece, France and Portugal had a contract duration of more than 40 years. Hence, we calibrated the duration of contract into four values: (1) more than 40 years as 0 (fully out), (2) 26-40 years as 0,33 (more out than in), (3) 16-25 years as 0,66 (more in than out), and (4) less than 15 years as 1 (fully in).

(6) Young project age (YOUNG)

Project age represents the number of years between contract closure and the moment of measurement, i.e. 2015. As PPP activity in Europe took off mainly after 1990, and projects are thus currently under 25 years in terms of project age, we scored and calibrated the projects in terms of young age, using direct calibration as the following thresholds: 5 per cent percentile being the threshold for non-membership = 25; 50 per cent percentile being the cross over point = 12.5 and 95 per cent percentile being the threshold for full membership = 0. In our sample of 25 projects, projects are between 6 and 25 years old, with an average age of 13,3 years old. For one project that is 28 years old (and thus above the maximum of 25 years), we scored 0.

5.5 Results

5.5.1 Does governmental PPP support matter in interaction with macro and micro conditions?

A first step is the necessity analysis for both the presence and absence of contract stability in the sample of road projects (see Table S2 in the Supplemental online information, second and third column). This analysis shows that *a less certain remuneration scheme (~REM) is a necessary condition for explaining the absence of contract stability for road infrastructure projects.* This implies that all renegotiated PPP in our sample are funded by usage payment schemes, making revenues dependent from traffic flows.

We now turn to the analysis of sufficient conditions for the presence of contract stability as well as its absence. The truth table is shown in the Supplemental online information (Table S3a). In producing the intermediate solutions, we expected the following conditions to contribute to the outcome 'presence of contract stability': being in a country with a high level of competitiveness (COMP), with a high level of governmental PPP support (PPPGS), a secure remuneration scheme (REM), an appropriate

risk allocation scheme (RISK), a short contract duration (SHORT) and a young project age (YOUNG). We set the cut off consistency ratio at level 0.85.

Table 19: Solution formula for the presence of contract stability as an outcome for road infrastructure projects

	Outcome: Presence of Contract Stability				Outcome: Absence of Contract Stability (occurrence of contract renegotiation)
	Solution 1a	Solution 1b	Solution 2	Solution 3	Solution 1
Solution terms	COMP***REM*** RISK *YOUNG	COMP*PPPGS***REM***YOUNG	**COMP*~SHORT*YOUNG**	COMP***PPPGS*~RISK*~SHORT**	**~COMP*~PPPGS***~REM*~RISK***SHORT*~YOUNG**
Consistency	0.79	0.81	0.91	0.85	0.89
Raw coverage	0.19	0.24	0.23	0.24	0.39
Unique coverage	0.01	0.03	0.02	0.03	0.39
Projects	Via-Invest Zaventem, E18 Muurla-Lohja , M-25 Motorway London Orbital	Via-Invest Zaventem, M80 Haggs, M-25 Motorway London Orbital	Via-Invest Zaventem, Coen Tunnel , M80 Haggs , M-25 Motorway London Orbital, E39 Orkdalsvegen Public Road	M80 Haggs, A19 Dishforth to Tyne Tunnel	Attiki Odos Athens Ring Roads
Overall solution consistency	0.93				0.89
Overall solution coverage	0.50				0.39

The table includes only the intermediate solution terms. The conditions that are in bold are core conditions which are included in the parsimonious solution terms

Solution 1b has no unique coverage and is not reported when we conduct the analysis with R-software. When analyzing the absence of contract stability as an outcome, there is model ambiguity with one extra parsimonious solution (~COMP*~PPPGS*SHORT*~RISK), which is not reported in Table 19. How this model ambiguity has been dealt with is detailed in the supplemental online information.

Table 19 shows four solution paths with specific combinations of conditions that are sufficient to explain contract stability representing an overall solution consistency ratio (0,93) and an overall solution coverage ratio of 0,50. The overlap between the solution paths is high and three cases can be

explained by these paths. None of the reported solutions in Table 2 and 3 have deviant cases with inconsistency in kind.

Road projects have stable contracts if they rely upon more secure remuneration schemes (REM), like availability payments, are set in a favourable macro-level business environment (COMP), are young as regards project age (YOUNG), and have either a more appropriate risk allocation (RISK) (solution 1a) or high levels of governmental PPP support (PPPGS) (solution 1b). However, as solution 2 with the highest raw coverage shows, road projects also experience stability even with longer contract (~SHORT) when they are in a country with high levels of competitiveness (COMP) and despite being young projects (YOUNG). Projects with a less appropriate risk allocation (~RISK) and longer contract duration (~SHORT), but that are in a country with a favourable context and a well-developed governmental PPP support (PPPGS), also avoid contract renegotiation (path 3).

The analysis of the absence of contract stability (see Table 19, right column) yields clearly less robust results, with a moderate overall solution consistency (0,89) and a rather low coverage ratio (0.39). Again, the cut off consistency ratio is set up at level 0.85. Road infrastructure PPPs with an older contract age (~YOUNG) and shorter contract duration (SHORT), face contract renegotiation, when they are in countries with low levels of competitiveness (~COMP) and weakly-developed governmental PPP support (~PPPGS), are funded by a less secure remuneration scheme (~REM) and have a less appropriate risk allocation (~RISK). However, the number of cases covered by this path is low. Moreover, it is clear from the truth table (see Table S3b in the supplemental online information) that contract renegotiation can go together with many different combinations of conditions, but these combinations have in common that renegotiated projects were funded by less secure usage-based payment schemes. Moreover, nine out of thirteen renegotiated projects were in an unfavourable macro-level business environment.

5.5.2 Which sub-dimensions of governmental PPP support matter in interaction with macro and micro conditions?

But if governmental PPP support plays a role, is this due to the joint effect of its three sub-dimensions, i.e. the presence of PPP-enhancing policies and political commitment, a PPP-specific legal and regulatory framework and well-developed PPP-supporting arrangements? Do they combine when avoiding contract renegotiation as we expect them to? We ran a second series of fsQCA models in which we brought in the three sub-dimensions of governmental PPP support as conditions, together with the macro-condition 'level of country competitiveness' and two of the micro-conditions, the 'secureness of the remuneration scheme' and 'young project age'. These conditions were retained because they are important in the paths we discussed in the previous section, with a less secure remuneration scheme even being a necessary condition for contract renegotiation.

Interestingly, the necessity analysis (see the lower part of the table S2 in the supplemental online information) shows that weakly developed PPP-supporting arrangements are *almost* a necessary condition for explaining the absence of contract stability for road infrastructure projects (consistency

0.89). Thus, all renegotiated PPPs have both a less secure remuneration scheme and are all, except one, located in a country in which PPP-units, PPP project appraisal instruments and procedures as well as standardisation of contracts are absent or weakly developed.

Table 20: Solution formula for the presence of contract stability as an outcome for road infrastructure projects with sub dimensions of governmental PPP support

	Outcome: Presence of Contract Stability		Outcome: Absence of Contract Stability (Occurrence Contract renegotiation)
	Solution 1	Solution 2	Solution 1
Solution terms	COMP *__REM__*YOUNG	__COMP__*SUPP*__POL*YOUNG__	__~COMP*POL*LEG__*~SUPP*~REM
Consistency	0.92	0.91	0.86
Raw coverage	0.30	0.26	0.56
Unique coverage	0.12	0.09	0.56
Projects	Via-Invest , E18 Muurla, M80 Haggs , M-25 M	Via-Invest , Coen T, M80 Haggs , M-25 M	Ionia Odos , Central Greece , Radial 2 , Eje Aeropuerto , Elefsina K , Moreas
Overall solution consistency	0.94		0.86
Overall solution coverage	0.38		0.56

Note: The table includes only the intermediate solution terms. The bold condition are core conditions included in the parsimonious solution terms. When analysing the presence of contract stability as an outcome, there is model ambiguity with two additional parsimonious solutions (SUPP*YOUNG and ~LEG*YOUNG), which are not reported in Table 20. How this model ambiguity has been dealt with is detailed in the supplemental online information.

The truth table is shown in supplemental online information (Table S3c). In producing the intermediate solutions, we expected the following conditions to contribute to the outcome 'presence of contract stability': being in a country with a high level of competitiveness (COMP), PPP-enhancing policies and political commitment (POL), PPP-enabling legal and regulatory framework (LEG), supporting arrangements (SUPP) and a secure remuneration scheme (REM), and a young project age (YOUNG). As shown in table 20, two configurations are produced with a high overall solution consistency (0.94) but they only cover 38 per cent of this outcome.

First, road PPPs projects with a younger project age (YOUNG) and a more secure remuneration scheme (REM), in a country with higher levels of competitiveness (COMP) experience contract stability. However, the second solution provides more insights into how the different dimensions of governmental PPP support matter for avoiding contract renegotiation. A younger project age (YOUNG), but in settings where there is a highly developed PPP-supporting arrangement (SUPP) in combination with PPP-enhancing policies and political commitment (POL), while being in countries

with high levels of competitiveness (COMP), will also experience contract stability. In these solution paths, a PPP-specific legal and regulatory framework does not play any role in enhancing contract stability.

When analysing the projects which have been renegotiated (absence of contract stability), we find one path with a solution consistency of 0,86 and a coverage ratio of 0.56 (Table 20 – right column). The truth table is included in the supplemental online information (Table 3d). In this analysis we set the cut off consistency ratio lower than 0.85 (0.820), however, this ratio is still higher than the required level 0.75 (Schneider & Wagemann 2012). Despite being in countries with rather well-developed PPP policies (POL) and PPP-specific legal and regulatory framework (LEG), projects in less favourable macro-level business environments (~COMP), with weakly developed supporting arrangements (~SUPP) and with a less secure remuneration scheme based on usage payments (~REM) face contract renegotiation. As previously and more generally stated, all renegotiated projects in our sample have less secure usage-based remuneration schemes, and all but one is in settings with weakly developed supporting arrangements.

5.6. Discussion and conclusion

In this chapter we studied the combined contributions of macro-, meso- and micro-level factors to contract stability of road infrastructure PPPs. We are particularly interested in the extent to which the governmental PPP support and its sub-dimensions in a country matters for contract stability, and how they combine with the macro-level business environment (measure by country competitiveness) and micro-level conditions, like the secureness of the project-related remuneration scheme, the appropriateness of the risk allocation, a short contract duration, and a young project age.

What are the main findings? First, while the found solution paths mostly have rather high consistency levels, their empirical relevance was rather modest. Hence, the variety in combinations is quite large and common patterns are rather hard to find. Alternatively, other important explanatory factors may not be included in the study (e.g. extent of competition in bidding, quality of tendering, see Domingues and Sarmento 2014).

Second, in the cases we can explain, we see the different ways in which macro-, meso- and micro-level conditions combine. Contract stability was found in projects in which a favorable macro-level business environment (high level of country competitiveness) joined up with a secure remuneration scheme and a young project age, combined with either a well-developed governmental PPP support or an appropriate risk allocation. But even when specific micro-level conditions are absent, a favorable macro-level context and well-elaborated governmental PPP support can go together with contract stability.

Third, all these renegotiated projects were funded by usage-based payment systems, as a less secure remuneration scheme is a necessary condition for contract renegotiation (Cruz and Marques 2013a; Sarmento 2014). Most often (in ten out of thirteen projects) this is combined with an unfavorable or worsening macro-level business environment (i.e. level of country competition), with shrinking traffic

flows leading to financial difficulties (see e.g. Markovsek, Hesselgren, and Perkins, 2015; Guasch and Straub 2009). It is striking of both of these conditions is included in solutions for contract stability, and their absence in the solution for contract renegotiation.

The contribution of the other micro-level conditions, like appropriateness of risk allocation and contract duration, to contract stability and contract renegotiation is less straightforward to interpret. Project age in specific combination with other conditions clearly matters for contract stability. However, older projects in an unfavorable macro- and meso- context with fewer favourable micro-level conditions will face contract renegotiations anyway. Four out of thirteen projects that were renegotiated have a young project age, whereas four with an old project age (above 12,5 years) did not experience any contract renegotiation. Nevertheless, future studies should more explicitly take the project age into account.

Fourth, the role of governmental PPP support with respect to contract stability was studied in this chapter (see Verhoest et al. 2015). Aspects of this government support are said to significantly influence contract renegotiation (Sarmento 2014; Domingues & Sarmento 2016; Montecinos & Saavedra 2011; Cruz & Marques 2013a: 2013b). Governmental PPP support in a country does not directly affect contract stability, only in combination with other factors. Moreover, together with a favourable macro-level business environment, it may yield contract stability even in combination with less optimal project-level features such as a less appropriate risk allocation and longer contract duration. However, a well-developed governmental PPP support is not strictly needed for contract stability, as long as if other conditions are favourable, which is shown for example in the Finnish E18 Muurla Lohja project.

Fifth, the chapter also considered the role of the three sub-dimensions of governmental PPP support in fostering contract stability i.e. policies and political support, legal and regulatory framework, and supporting arrangements. Clearly, the most relevant dimension is the existence of well-developed supporting arrangements, in the form of a *strong PPP-unit, standardized ex ante evaluation instruments as well as standardized contracts*. In a favourable macro-level business environment, and together with clear PPP-advocating policies and political commitment, this leads to PPP contracts being stable. More importantly, the absence of such supporting arrangements is common to all but one renegotiated projects. Even with the presence of PPP-advocating policies and political commitment as well as PPP-specific legal and regulatory framework, an unfavourable macro-level business environment, lack of supporting arrangements and a less secure remuneration scheme leads to contract renegotiation. Some of the Spanish and Greek PPPs user-funded toll road projects in our sample were driven towards contract renegotiation by global financial crisis, and could not be reversed due to failing supporting arrangements. PPPunits acting as regulatory bodies, standardized ex ante evaluation instruments and the existenceof standardized contracts are indeed said to help to select PPP projects with good viability, to avoid political biases, draft and manage contracts and structure PPPs in a resilent way (Guasch, Laffont and Straub, 2008; Sarmento 2014; Domingues and Sarmento 2016; Montecinos & Saavedra 2011; Cruz & Marques 2013a: 2013b).

However, in our sample, in contrast to literature (Domingues and Sarmento 2016; Cruz and Marques 2013b) neither the presence of a well-developed PPP-specific legal and regulatory framework, nor of

PPP-promoting policies and political commitment safeguard PPP projects from being renegotiated in case these projects have a usage-based remuneration schemes in an unfavourable macro-level business environment. However, one could argue that particularly due to the strong political support for PPPs, problematic PPPs are given the opportunity for renegotiation, because politicians do not want them to fail. Likewise, a PPP-specific legislation may provide for provisions that regulate under which circumstances contract renegotiation are allowed and how such renegotiations should be organized, to enhance benefits for society and to avoid a decrease in value for money.

The chapter however has some limitations. First, due to the limitation in number of conditions allowed in the analyses, we used compound or composite factors, like the level of country competitiveness as measurement of the macro-level business environment. Indeed, the macro-level business environment is considered in literature to be aggregative, as several interdependent, dynamic elements together influence business decisions (see also Markovsek, Hesselgren, and Perkins, 2015). Hierarchical clustering in case of the condition of governmental PPP support avoids the biases which composite indices might suffer. Nevertheless, studying larger samples of PPP projects would allow increasing the number of conditions allowing us to further de-compose these concepts and study the interaction of their components, like we already did for governmental PPP support. Moreover, larger samples would allow introducing additional micro-level conditions, or to study differences across PPPs for different kinds of infrastructure or different sectors.

Moreover, our study does not take into account the past experience with PPPs or contract renegotiations within countries into account as conditions, although this would be recommendable for future studies. Alternatively, a time-series study would allow to incorporate such an experiential dimension and to study whether and how a gradual expansion of the governmental PPP support in a country increasingly sfaguards PPP contract from being renegotiated over time.

Practitioners should take from this study that no single factor in itself will enhance contract stability or lead to contract renegotiation. It is the conjunction of specific macro-, meso- and micro- factors that counts. However, choosing for a user-paid toll-based remuneration scheme in a country with a potentially worsening macro-level business environment and where PPP supporting arrangements (like a PPP unit, standardized ex ante evaluation instruments and standardized contracts) are missing, significantly increases the likelihood of contract renegotiation.

Supplemental online information

to the article 'CONTRACT STABILITY IN EUROPEAN ROAD INFRASTRUCTURE PPPS: How does governmental PPP support contribute to preventing contract renegotiation?'
by Raden Murwantara Soecipto and Koen Verhoest

Contents: Calibration table and truth tables as well as additional information on model ambiguity and selection choices made.

Table S1. Calibration of Outcome and Conditions

No	Projects	OUTCOME Contract stability		The level of country competitiveness (COMP)		Governmental PPP support (PPPGS)		Policy & political commitment (POL)		Legal & regulatory framework * (LEG)		Supporting Arrangement (SUPP)		Risk Allocation (RISK)		Remuneration Scheme (REM)		Short contract duration (SHORT)		Young project age (YOUNG)	
		Value	Cal	Value	Cal.	Value	Cal.	Value	Cal.	Value	Cal.	Value	Cal.	Value	Cal.	Value	Cal.	Value	Cal.	Value	Cal.
1	Attiki Odos	Renegotiation-less 3 years	0	0,54	0,29	CL5	0.2	CL3	0.6	CL4	0.2	CL6	0.0	Rather inappropriate	0.4	User charges-end users	0	25	0,67	19	0.17
2	Rion Antirion	No renegotiation	1	0,45	0,1	CL5	0.2	CL3	0.6	CL4	0.2	CL6	0.0	Rather appropriate	0.6	User charges-end users	0	42	0	19	0.17
3	Ionia Odos	Renegotiation-less 3 years	0	0,51	0,21	CL3	0.6	CL3	0.6	CL2	0.6	CL5	0.2	Mostly appropriate	0.8	Toll charges – mixed funding	0,2	30	0,33	8	0.75
4	Central Greece Motorway	Renegotiation more 3 years	0,4	0,44	0,08	CL3	0.6	CL3	0.6	CL2	0.6	CL5	0.2	Mostly appropriate	0.8	Toll charges – mixed funding	0,2	30	0,33	8	0.75
5	BNRR (M6) Tollway	Renegotiation more 3 years	0,4	0,64	0,65	CL1	1.0	CL1	1.0	CL4	0.2	CL2	0.8	Rather appropriate	0.6	User charges-mixed funding	0,2	53	0	23	0.07
6	M80 Stepps to Haggs	No renegotiation	1	0,62	0,57	CL1	1.0	CL1	1.0	CL4	0.2	CL1	1.0	Rather inappropriate	0.4	Performance payment- city	0,6	33	0,33	6	0.83
7	A19 Dishfort	No renegotiation	1	0,62	0,57	CL1	1.0	CL1	1.0	CL4	0.2	CL1	1.0	Rather inappropriate	0.4	Usage payment-national	0,4	30	0,33	19	0.17
8	A22-Algarve	Renegotiation more 3 years	0,4	0,53	0,26	CL5	0.2	CL5	0.2	CL2	0.6	CL4	0.4	Rather inappropriate	0.4	Shadow toll-mixed funding	0,4	30	0,33	15	0.35
9	Radial 2	Renegotiation more 3 years	0,4	0,56	0,35	CL3	0.6	CL1	1.0	CL2	0.6	CL4	0.4	Mostly inappropriate	0.2	User charges-end users	0	24	0,67	15	0.35
10	Eje Aeroporto	Renegotiation more 3 years	0,4	0,55	0,32	CL3	0.6	CL1	1.0	CL2	0.6	CL4	0.4	Rather inappropriate	0.4	User charges-end users	0	25	0,67	13	0.47
11	M 45	Renegotiation more 3 years	0.4	0,67	0,74	CL3	0.6	CL1	1.0	CL2	0.6	CL6	0.0	Rather inappropriate	0.4	Usage payment-city	0,4	25	0,67	17	0.25
12	A23 Beira	Renegotiation more 3 years	0,4	0,53	0,26	CL5	0.2	CL5	0.2	CL2	0.6	CL4	0.4	Rather inappropriate	0.4	Shadow toll-mixed funding	0,4	30	0,33	16	0.30
13	Elefsina Khorinthos	Renegotiation-less 3 years	0	0,51	0,21	CL3	0.6	CL3	0.6	CL2	0.6	CL4	0.4	Mostly appropriate	0.8	Toll charges-mixed	0,2	30	0,33	8	0.75
14	Via Invest Zaventem	No renegotiation	1	0,65	0,68	CL2	0.8	CL2	0.8	CL3	0.4	CL3	0.6	Mostly appropriate	0.8	Availability	1	30	0,33	8	0.75

15	M25 Motorway Orbital	No renegotiation	1	0,62	0,57	CL1	1.0	CL1	1.0	CL4	0.2	CL1	1.0	Mostly appropriate	0.8	Availability	1	30	0,33	6	0.83
16	Moreas Motorway	Renegotiation more 3 years	0,4	0,51	0,21	CL3	0.6	CL3	0.6	CL2	0.6	CL5	0.2	Rather appropriate	0.6	Toll charges-mixed funding	0,2	30	0,33	8	0.75
17	C-16 Terrasa-Manresa	Renegotiation more 3 years	0.4	0,64	0,65	CL5	0.2	CL2	0.8	CL4	0.2	CL6	0.0	Rather inappropriate	0.4	User charges-end users	0	50	0	28	0.02 **
18	Millau Viaduct	No renegotiation	1	0,6	0,5	CL4	0.4	CL6	0.0	CL1	0.8	CL4	0.4	Mostly inappropriate	0.2	Toll charges-mixed funding	0,2	78	0	14	0.41
19	Bre Be Mi	No renegotiation	1	0,47	0,12	CL5	0.2	CL4	0.4	CL4	0.2	CL5	0.2	Rather appropriate	0.6	Toll charges-mixed funding	0,2	20	0,67	6	0.83
20	Lusoponte Bridge	Renegotiation more 3 years	0.4	0,59	0,46	CL5	0.2	CL5	0.2	CL2	0.6	CL4	0.4	Rather inappropriate	0.4	User charges-end users	0	35	0,33	21	0.12
21	Coen Tunnel	No renegotiation	1	0,71	0,84	CL1	1.0	CL1	1.0	CL4	0.2	CL3	0.6	Rather appropriate	0.6	User charges-end users	0	30	0,33	7	0.79
22	E39 Orkdalvegen	No renegotiation	1	0,79	0,95	CL6	0.0	CL5	0.2	CL4	0.2	CL6	0.0	Rather inappropriate	0.4	Toll charges-mixed funding	0,2	27	0,33	12	0.53
23	E18 Grimstad	No renegotiation	1	0,83	0,97	CL6	0.0	CL5	0.2	CL4	0.2	CL6	0.0	Mostly appropriate	0.8	Toll charges-mixed funding	0,2	25	0,67	9	0.70
24	E4 Helsinki	No renegotiation	1	0,7	0,82	CL6	0.0	CL5	0.2	CL4	0.2	CL6	0.0	Mostly inappropriate	0.2	Shadow toll	0,4	15	1	17	0.25
25	E18 Muurla Lohja	No renegotiation	1	0,77	0,93	CL6	0.0	CL5	0.2	CL4	0.2	CL6	0.0	Rather appropriate	0.6	Availability	1	24	0,67	10	0.65

* indicates calibration using cluster analysis for 4 clusters

**the project C-16 Terrasa Manresa is 28 years old and because of the use of direct calibration the value is transposed to '0.02' instead of '0'. This has no relevant impact upon the results of the analyses.

Table S2. Necessary conditions for contract stability for road infrastructure projects

Conditions	Road infrastructure projects	
	Outcome: Contract stability	
	Presence	Absence
High level of country competitiveness (COMP)	0,67 (0,87)	0,49 (0,36)
Low level of country competitiveness (~COMP)	0,51 (0,64)	0,82 (0,58)
High level of governmental PPP support (PPPGS)	0,55 (0,75)	0,64 (0,49)
Low level of governmental PPP support (~PPPGS)	0,63 (0,76)	0,67 (0,45)
More appropriate risk allocation (RISK)	0.64 (0.78)	0.71 (0.49)
Less appropriate risk allocation (~RISK)	0.59 (0.78)	0.69 (0.52)
More secure remuneration scheme (REM)	0,44 (0,95)	0,24 (0,30)
Less secure remuneration scheme (~REM)	0,68 (0,61)	**0,96 (0,49)***
Shorter duration of contract (SHORT)	0,49 (0,79)	0,53 (0,48)
Longer duration of contract (~SHORT)	0,68 (0,72)	0,76 (0,46)
Shorter project age (YOUNG)	0.60 (0.80)	0.53 (0.40)
Longer project age (~YOUNG)	0.55 (0.68)	0.73 (0.51)
High level of PPP-enhancing policy & political commitment (POL)	0.63 (0.67)	0.73(0.44)
Low level of PPP-enhancing policy & political commitment (~POL)	0.48 (0.76)	0.44 (0.40)
High level of PPP-specific legal & regulatory framework (REG)	0.43 (0.69)	0.73 (0.67)
Low level of PPP-specific legal & regulatory framework (~REG)	0.80 (0.84)	0.67 (0.39)
High level of PPP-supporting arrangement (SUPP)	0.48 (0.88)	0.40 (0.42)
Low level of PPP-supporting arrangement (~SUPP)	0.69 (0.67)	0.89 (0.49)

* indicates a necessary condition at consistency level of 0.90

Table S3a. Truth table analysis 1 – Presence of contract stability

COMP	PPPGS	REM	SHORT	RISK	YOUNG	n	incl	PRI	CASES
1	1	1	0	1	1	2	0.887	0.842	Via-Invest, M-25 Motorway
1	1	0	0	0	0	1	0.871	0.724	A19 Dishfort
1	0	1	1	1	1	1	0.865	0.792	E18 Muurla-Lohja
1	1	1	0	0	1	1	0.860	0.785	M80 Haggs
1	0	0	0	0	1	1	0.849	0.705	E39 Orkdalsvegen
1	1	0	0	1	1	1	0.847	0.729	Coen Tunnel
1	0	0	1	1	1	1	0.837	0.691	E18 Grimstad K
1	0	0	1	0	0	1	0.834	0.644	E4 Helsinki-Lahti
1	1	0	0	1	0	1	0.824	0.559	M6 Toll
1	0	0	0	0	0	1	0.812	0.594	C-16 Terrassa Manresa
0	0	0	0	1	0	1	0.807	0.594	Rion Antirion
0	0	0	1	1	1	1	0.790	0.509	BreBeMi
1	1	0	1	0	0	1	0.777	0.509	M-45
0	0	0	0	0	0	3	0.762	0.475	A22 – Algarve, A23 – Beira, Millau Viaduct, Lusoponte
0	1	0	1	0	0	2	0.760	0.472	RADIAL 2 TOLL, EJE AEROPUERTO
0	0	0	1	0	0	1	0.746	0.301	Athens Ring Road
0	1	0	0	1	1	4	0.663	0.423	Ionia Odos, Central Greece (E65), Elefsina Korinthos, Moreas

Cut-off consistency = 0.847 (0.85)

Table S3b. Truth table analysis 1 – Absence of contract stability

COMP	PPPGS	REM	SHORT	RISK	YOUNG	n	incl	PRI	CASES
0	0	0	1	0	0	1	0.891	0.699	Attiki Odos (Athens Ring Road)
0	1	0	1	0	0	2	0.786	0.528	RADIAL-2, EJE AEROPUERTO (M12)
0	0	0	0	0	0	3	0.785	0.525	A22 - Algarve,A23 – Beira Millau Viaduct, Lusoponte
0	0	0	1	1	1	1	0.782	0.491	BreBeMi
0	0	0	0	1	0	1	0.778	0.441	Rion Antirion Bridge
1	1	0	1	0	0	1	0.769	0.491	M-45
0	1	0	0	1	1	4	0.753	0.577	Ionia Odos, Central Greece (E65) Elefsina Korinthos, Moreas
1	1	0	0	1	0	1	0.725	0.406	BNRR (M6 TOL)
1	0	0	0	0	0	1	0.718	0.406	C16 Terrassa Manresa
1	0	0	1	0	0	1	0.699	0.356	E4 Helsinki Lahti
1	1	0	0	0	0	1	0.662	0.276	A19 Dishforth
1	0	0	0	0	1	1	0.640	0.295	E39 Orkdalsvegen
1	0	0	1	1	1	1	0.634	0.309	E18 Grimstad - Kristiansand
1	1	0	0	1	1	1	0.587	0.271	Coen Tunnel
1	1	1	0	0	1	1	0.490	0.215	M80 Haggs
1	0	1	1	1	1	1	0.488	0.208	E18 Muurla Lohja
1	1	1	0	1	1	2	0.397	0.158	Via-Invest Zaventem,M-25 Motorway

Cut-off consistency = 0.891 (0.89)

Table S3c. Truth table analysis 2 – Presence of contract stability

COMP	POL	LEG	SUPP	REM	YOUNG	n	incl	PRI	CASES
1	1	0	1	1	1	3	0.874	0.835	M80 Haggs,Via-Invest,M-25 M
1	1	0	1	0	1	1	0.873	0.759	Coen Tunnel
1	0	0	0	1	1	1	0.868	0.820	E18 Muurla-Lohja
1	0	0	0	0	1	2	0.828	0.763	E39 Orkdalsvegen, E18 Grimstad
1	1	0	1	0	0	2	0.821	0.618	M6 Toll,A19 Dishforth
1	0	0	0	0	0	1	0.818	0.716	E4 Helsinki
1	1	1	0	0	0	1	0.805	0.554	M-45
1	1	0	0	0	0	1	0.789	0.518	C-16 Terrassa
0	1	0	0	0	0	2	0.780	0.520	Attiki Odos ,Rion-Antirion
0	1	1	0	0	0	2	0.765	0.434	RADIAL 2 ,EJE AEROPUERTO
0	0	0	0	0	1	1	0.744	0.559	BreBeMi
0	0	1	0	0	0	3	0.710	0.477	A22 - Algarve,A23 – Beira Millau V,Lusoponte
0	1	1	0	0	1	4	0.635	0.300	Ionia Odos ,Central Greece Elefsina K, Moreas

Cut-off consistency = 0.868 (0.87)

Table S3d. Truth table analysis 2 – Absence of contract stability

COMP	POL	LEG	SUPP	REM	YOUNG	n	incl	PRI	CASES
0	1	1	0	0	1	4	0.843	0.700	Ionia Odos ,Central Greece Elefsina K,Moreas
0	1	1	0	0	0	2	0.820	0.566	RADIAL 2 ,EJE AEROPUERTO
0	1	0	0	0	0	2	0.763	0.457	C-16 Terrassa
1	1	0	0	0	0	1	0.762	0.480	Attiki Odos ,Rion-Antirion
1	1	1	0	0	0	1	0.757	0.446	M-45
0	0	1	0	0	0	3	0.741	0.543	A22 - Algarve,A23 – Beira Millau V,Lusoponte
1	1	0	1	0	0	2	0.696	0.353	M6 Toll,A19 Dishforth
0	0	0	0	0	1	1	0.675	0.441	BreBeMi
1	1	0	1	0	1	1	0.602	0.241	Coen Tunnel
1	0	0	0	0	0	1	0.542	0.284	E4 Helsinki
1	0	0	0	0	1	2	0.448	0.237	E39 Orkdalsvegen ,E18 Grimstad
1	0	0	0	1	1	1	0.397	0.180	E18 Muurla-Lohja
1	1	0	1	1	1	3	0.362	0.165	M80 Haggs,Via-Invest,M-25 M

Cut-off consistency = 0.820 (0.82)

Additional information on model ambiguity and selection choices made

Current standards of transparency in QCA studies would entail to be transparent upon instances of model ambiguity[28] and alternative models than the one presented in the article which arise from this model ambiguity, even if one follows the recommendation of Legewie (2013) that in case of model ambiguity one can select a prime implicant based on substantive and theoretical knowledge as we did in the article. We considered also the options proposed by Baumgartner and Thiem (2017) to decrease the effect of model ambiguity such as: data improvement, modification of consistency threshold factor frames as well as switching strategies for remainder processing.

1. When doing the analysis of the sufficient conditions for the absence of contract stability (see Table 2, right column), there was one additional parsimonious solution (~COMP*~PPPGS*SHORT*~RISK) additional to the one that was reported in the article (~COMP*~PPPGS*SHORT*~YOUNG). The latter prime implicant was selected based on the recommendation of Legewie (2013) that "in case that one or prime implicants is logically redundant (…), the user has to employ substantive and theoretical knowledge to decide which prime implicants to use" (Schneider and Wagemann, 2007). Both parsimonious solutions cover the same case. The analysis of the selected prime implicant (~COMP ~PPPGS SHORT ~YOUNG) resulted in the intermediate solution reported in the right column of Table 2 in the published article: ~COMP*~PPPGS*~REM*SHORT*~RISK*~YOUNG -> ~NOREN.

   In order to be fully transparent we here report the result of the analysis using the other prime implicant (~COMP ~PPPGS SHORT ~RISK). However, this analysis produces exactly the same intermediate solution as in the analysis reported in table 2 (right column) in the published paper. The cases covered, solution coverage and solution consistency are also exactly the same.

2. When doing the analysis of the sufficient conditions for the presence of contract stability with the different components of PPPGS (see table 3 left and middle column), there are three prime implicants (PI), implying model ambiguity with three models equally fitting the data. We report in the paper upon the analysis of the third prime implicant which we select based on substantive and theoretical knowledge, being: COMP POL YOUNG. The results show the two intermediate solution formulas: COMP*REM*YOUNG + COMP*POL*SUPP*YOUNG -> NOREN and also two parsimonious solutions: REM and COMP*POL*YOUNG, which we reported in the paper.
   In order to be fully transparent we report here the results of the analysis of the first prime implicant: SUPP YOUNG, the intermediate solution gives us exactly the same results as with the third prime implicant above, being COMP*REM*YOUNG + COMP*POL*SUPP*YOUNG -> NOREN. However, the parsimonious solution seems to be more simple: REM and SUPP*YOUNG. Hence, when selecting PI 3 and PI 1, we obtain the same configuration in the intermediate solution (with the same cases covered, the same consistency value, raw and unique coverage, and the same solution coverage and solution consistency). Both are in line with substantive and theoretical knowledge.

   We also report the result of the analysis using the second prime implicant. When using the second implicant (PI 2) POL ~LEG YOUNG, which is the least in line with the substantive and theoretical knowledge, there are two parsimonious solutions: REM and POL*~LEG*YOUNG (the latter parsimonious solution covers the same cases as the parsimonious solutions mentioned under PI 3being COMP*POL*YOUNG and under PI 1 SUPP*YOUNG). The first intermediate solution is the same as with the other two prime implicants: COMP*REM*YOUNG. However, the second

[28] Model ambiguity is whenever a Prime Implicant chart results that has columns that are exclusively covered by inessential prime implicants, so-called orphan columns.

intermediate solution, being COMP*POL*~LEG*SUPP*YOUNG has an extra condition (~LEG) in comparison to the previously mentioned second intermediate solution path under PI 3 and PI 1 (COMP*POL*SUPP*YOUNG). However, the cases covered by this new intermediate solution are exactly the same as the cases covered by the second intermediate solution path mentioned in table 3 in the published article (COMP*SUPP*POL*YOUNG), and the consistency value, raw coverage and unique coverage are exactly the same. Also the values for solution coverage and solution consistency of the intermediate solution paths under PI 2 are exactly the same values as under PI 3 and PI 1. Hence, the newly found intermediate solution arising from PI 2 equates one of the intermediate solutions found through the analysis of PI 3 and PI 1, as the extra condition (~LEG) mentioned is not really needed to explain the outcome in these cases, implying that this condition is redundant in this sufficient set of conditions in order to explain the presence of the outcome (contract stability).

As in the published PMR article the interpretation and discussion of the results focuses fully on the interpretation of the intermediate solutions and not on the parsimonious solutions, the analysis of the alternative prime implicants and models does not have an effect on the result discussion and interpretation in the article[29].

References

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[29] Indeed, as is written on page 1159 of the article, in these solution paths, having a PPP-specific legal and regulatory framework does not play a role in enhancing contract stability. Even more so, in the involved four cases covered by the solution path COMP*SUPP*POL*YOUNG, not having a PPPspecific legal and regulatory framework is one condition, albeit a redundant one, for contract stability.

Chapter 6

How government support can help to deliver PPP projects on time and within budget: a qualitative comparative analysis of infrastructure projects in different European countries[30]

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[30] Not published

6.1 Introduction

One main motivation of government for adopting PPPs is to have infrastructure projects delivered on time and within budget. Reviews by researchers and international organizations indicate that PPP projects compared to traditional procurement often score better in terms of on-time and within budget delivery. For example, when compared to public procurement in the UK, PPPs were delivered less often above budget (22% compared to 73%) and experienced relatively less time over-run (24% versus 70%) (NAO 2003). NAO (2008) noted that the differences might be less large, but still noticeable (35% versus 46% over time and 31% versus 37% budget over-run). PPIAF (2012) summarizes the performance of PPPs in Australia as shown in table 21, and comes to similar conclusions.

Table 21: Comparing PPP and Public Procurement in the Australia (PPIAF 2012)

Sources	Comparison	Proportion of Projects Over Budget (%)		Proportion of Projects with time over-run (%)	
		PPP	Public	PPP	Public
Infrastructure Partnerships Australia, 2007	Original approval to final	12%	35%	13%	26%
	Contract to final	1%	15%	3%	24%
Duffield Review of PPP Performance, 2008	Original announcement to final	24%	52%	17%	15%
	Budget approval to final	8%	20%	12%	18%
	Contract to final	4%	18%	14%	26%

In the past decade, much research has focused on critical success factors (CSFs) or on the determinants of PPP project success (or the causes of project failure). Literature defines factors at three different levels. Macro-level factors refer to the macro-institutional, economic and financial context of a country, while micro-level factors are related to the PPP project itself, like contractual risk-allocation. Inbetween these two levels there is the meso-level which refers to how governments support PPPs in their development, design and management. So far, it remains unclear how factors at these three levels interact or combine when causing project success in terms of being on time and within budget (or failure). Do they mutually reinforce each other or compensate for each other's effects? The primary aim of this chapter is to study how factors at these three levels interact when leading to project success or failure. We use fuzzy-set Qualitative Comparative Analysis (fsQCA), which enables to see which conditions lead in different combinations to a certain outcome.

A second lacuna in the literature is that it remains unclear whether the governmental PPP support (Verhoest et al. 2015) in a certain country as meso-level factor actually enhances project success in terms of being on time and within budget. The success of PPPs is said to depend upon the role of government in creating good pre-conditions for the development of PPP projects in a certain country. This generally encompasses the establishment of an adequate legal and regulatory framework; the creation of a coordinating and supportive authority; the selection of a suitable concessionaire; and the active involvement in the project life-cycle phases (Kwak et al. 2009). In order to have a successful PPP program, the government should take several actions, for example, creating a favourable environment for private providers of infrastructure (Zhang & Kumaraswamy 2001), empowering public capacity building (Aziz 2007); and exposing positive political willingness and a clear rationale to increase public capacity for identifying, awarding and governing projects (Matos Castano 2011). In this respect, Verhoest et al. (2015) develop the concept of 'governmental PPP support', which include three dimensions of mutually reinforcing elements: PPP-enhancing policies and political commitment, a PPP-enabling legal and regulatory framework and supporting arrangements. Moreover, they show that the extent to which such governmental PPP support is present differs substantially across European countries. The second aim of

this chapter is to shed more light on the actual contribution of the governmental PPP support and its respective dimensions on project success in terms of being on time and within budget, as well as how this governmental PPP support interacts with macro- and micro-level factors.

The central research questions are (1) *to what extent governmental PPP support affects project success and failure (being on/over time and on/over cost in the implementation stage) in PPPs in European countries, and (2) how this meso-level factor interacts with the overall institutional and financial-economic context as macro-level factor as well as with project-specific micro-level factors in doing so.*

We attempt to provide useful lessons learned to academics, practitioners, policy makers and to all stakeholders involved in transport infrastructure projects.

This chapter is structured as follows. We first review the literature, formulate research questions and theoretical framework (section 2) as well as the methodology (section 3). Afterwards, a fuzzy set Qualitative Comparative analysis (fs QCA) is conducted in order to learn which conditions lead (in different combinations) to the outcome (section 4). In the discussion section, we examine the quality of fsQCA results by visualizing with XY plots and process tracing to study the causal mechanisms for explaining the outcome. We analyse more in-depth of each dimension of governmental PPP support (section 5). Finally, we draw some conclusion (section 6).

6.2 Qualitative and quantitative studies regarding project success

Project success (i.e. on time and within budget/on cost)

The definition of project success differs among researchers. First, Shenhar et al. (1997) classify four dimensions of project success including: (1) project efficiency (short-term measure, completed on time & with the specified budget), (2) impact on customers, (3) business success, and (4) preparing the future. Second, Atkinson (1999) specifies and measures project success based on the stages of project delivery: (1) delivery stage (cost, time, quality and efficiency), (2) post-delivery stage: (2a) the system and (2b) the benefits. Third, micro and macro viewpoints of project success introduced by Lim & Mohammed (1999) comprise (1) micro (time, cost, quality, performance & safety), and (2) macro (time, satisfaction, utility and operation). Finally, Sadeh et.al (2000) formulates success dimensions and measures such as: (1) meeting design goals (functional, technical, schedule & and budget), (2) benefits to the end-user, (3) benefits to the delivery organization, and (4) benefits to the defence and national infrastructure. In this chapter, we define delivery PPPs projects success as part of 'the iron-triangle'[31] being on cost and on time.

PPP projects' life cycle

One of the rationales of using PPPs as an alternative financing method for the provision of public infrastructure is to cope with the shortcomings of the conventional method of providing infrastructure. Advocates of PPPs view this method as having advantages over the traditional procurement in terms of the delivery of projects on cost and within budget. As Price Waterhouse Cooper (2005) noted, on the one hand, the conventional method might result in a more expensive facility than was originally planned and a delayed commencement of the maintenance and operation. On the other hand, concessions or PPPs are expected to provide a commercial incentive for synergy, flexibility and efficiency from initial design,

[31] Atkinson (1999) introduces a measure of project management success which is later on called 'iron triangle' include cost, time and quality.

through build and operation. The awarding authorities stipulate a standard level of performance and they only start the stream of revenue payments at the commencement of the operation and maintenance phase of the project. This creates an incentive for the private sector to realise the construction quickly within planning and budget (Dewulf et al., 2012)

The project financing plays a key role in project life cycles. As illustrated by Khmel & Zao (2015), the private actors usually invest their money at the design stage and accumulate it at the highest level at project completion. At this moment, the costs are incurred and paid over several years and capitalized in the cost of construction. *It is a critical point for the implementation stage whether or not the project can be delivered of on time and within budget*. Moreover, the project will start generating revenues or cash inflows during the operation of the facility and can pay off debts[32].

Indeed, drivers of the projects' success can be affected by multiple factors. In the remaining section, we will discuss more in-depth these factors by distinguishing between macro-level, meso-level and micro-level factors.

Factors for explaining PPP projects success in terms of being on cost and on time

In the past decade, much research has focused on critical success factors (CSFs) or on the determinants of project success (or the causes of projects being failure). Using a comprehensive approach, we map and synthesise factors influencing project success and failure, and we analyse the interaction of macro, meso and micro-level factors to explain success or failure. Until recently, research attempting to link the causal relationship between factors at the different levels (and their interaction) and project success has not been found in PPP literature so far (see for example: Hammami et al 2006; Chan et al 2010; Percoco 2014; Osei-Kyei & Chan et al. 2015; Mota & Moreira 2015).

Macro-level factor, being the level of country competitiveness

Research has shown that the institutional and macro-economic context in a country influences private sector involvement in infrastructure provision and the take-up of PPPs. However, this context, reflecting to what extent the investment climate is favourable in a country, also affect in multiple ways the extent to which PPP can achieve project success in terms of on time and within budget. First, both qualitative and quantitative research emphasize the quality and strength of the legal and judicial system (rule of law and regulatory quality); government accountability (Galillea & Medda 2010); the political stability (Mota & Moreira 2015) and low levels of corruption ((Hammami et al 2006; Galilea & Medda 2010; Percoco 2014; Mota & Moreira 2015; Delhi & Mahalingam, 2013; Osei-Kyei & Chan 2015; Moszoro 2010). However, existing research also showed factors influencing project failure like uncertainty in political issues (Yang at al 2010); bureaucratic indecisions (Flyberg et al 2003); and unconducive regulatory environments (Shibani & Amurugam 2015). *We argue that a strong and stable institutional environment might make the initial allocation of risk and the way challenges to a PPP contract are handled in a predictable way. Moreover, chances to incur financial difficulties due to changes in political support and regulations as well as corruption are minimized. These elements will also guarantee the private partners of their investment more specifically during the project implementation. Thus, projects located in developed*

[32] Occasionally, the cash-flow of projects still experiences shortage (minus) during a couple of years in the operation stage because of two reasons. First, the project has not commenced the collection of income such as user charges, availability payment, subsidy etc. Second, the income of operation has not fully covered the project financing from design, implementation and initial operation. Then, it will normally change into positive cash-flow when the project has collected the income routinely and extensively as set in the contract. Thus, the projects still demand financial sources (i.e. debts and equity) for running the projects even in the operation stage. We expect that an optimal financing scheme is a crucial factor for project delivery on time and within budget.

countries with good macro-institutional environments have more chances for projects to be on time and within budget.

Second, a major contextual influence comes from the macro-economic situation of a country, with project success being often affected by the level of public debt, a larger market size and stability of the macro-economic situation (Hammami et al. 2006; Mota & Moreira 2015; Moszoro 2010; Chan 2010a). On the other hand, instability in the macro-economic situation (Kaliba et al. 2009), currency devaluation and rises in interest rates (Foucacre et al 1990), the unstable cost of material (Chan & Park 2005; Nida et al 2008) as well as price inflation (Shibani & Amurugam 2015; Mansfield 1994) proof to enhance project failures in terms of cost overrun and delayed. *A context in which the stability of macro-economic situation can be maintained, the initial risk allocation is able to cope with unpredictable events and to safeguard for changes in the financial structure, enable to complete projects on time and within budget. We also expect the opposite.*

Finally, the financial situation of a country, as the availability of financial market, becomes one of drivers for project success (Chan et al. 2010a). However, a non-conducive financial market (Chan et al. 2010b) has a negative effect on the proceeding of ongoing projects and will foster failures (cost overrun and delayed). *A stable financial situation may handle the fluctuation of cost of projects and allows to run the projects as expected. As a result, the projects can be implemented on-schedule and also within budget. On the contrary, a non-conducive financial market may bring about problems in the project financing. Indeed, it will weaken the sustainability of the project implementation stage.*

At macro-level the institutional environment, macro-economic situation as well as the financial conditions jointly affect the PPP project success (failure), while also mutually affecting each other. As a result, we argue that this macro-level context *should be analysed comprehensively, rather than through separate indicators.* Basically, PPP projects in their implementation are affected by the more general business environment in a country. In search for an aggregate concept which would enable to capture the macro-institutional, political and economic-financial environment affecting infrastructure PPPs in a certain country, we suggest to use the concept of *country competitiveness*, as defined by Schwab and Sala-i-Martin (2014: 3) as 'the set of institutions, policies, and factors that determine the level of productivity of a country', as well as the return on investment rate and the economic growth of a country. This concept also refers to more sectoral policies affecting a country competitiveness, like labour market policy and innovation policy which will also enhance the performance of PPPs, more specifically the delivery of the projects on time and within budget.

In short, we expect that when PPP projects are situated in countries with relatively high levels of country competitiveness, this will contribute to these projects being on time and within budget.

Meso-level factor being the level of PPP governmental support

In order to stimulate and strengthen PPPs, the government can provide a set of PPP-enhancing policies, a PPP-specific regulatory framework and PPP-supporting arrangements (Verhoest et al. 2015). Table 22 presents the different dimensions of governmental support for PPPs and an argument of their relevance for enhancing project success (or project failure) by referring to literature.

Table 22: Key Dimension of governmental PPP support (Verhoest et al. 2015) and their relevance to project success (failure)[33]

Dimensions of governmental PPP support	PPP Project Success	PPP Projects Failure
PPP-enhancing policies & political commitment • existence of a strategy document formulating an explicit PPP policy • existence of a general PPP programme (incl. time schedule) • political support for PPPs	• political support (Jacobson & Choi, 2008; Tam, 1994) • detailed project pipe line planning (Mladenovic et al 2013)	• inappropriate government policies towards PPP (Chan & Park 2005) • risks of optimism biases in project selection (Estache & Saussier 2014) • poor project design and implementation (Chan et al 2010; Morris 1990)
PPP-specific legal & regulatory framework • specific PPP or concession law: (a) existence • specific PPP or concession law: (b) scope regarding definitions of four items • elements provided in the general legal framework (including public procurement law)	• appropriate legal regulations (Zagozdzon 2013) • sound legal and strong regulatory framework (Jamali, 2004; Azis, 2004; Tam, 1994) • guarantees provided by government (Liu 2013; Ng 2012)	• lack of well-established legal framework (Chan et al. 2010)
PPP-supporting arrangements • acting public institutions/PPP-supporting units • procedures for PPP project appraisal and prioritisation, role of main sectors in project stages • standardised processes and documents for PPPs in transport	• capacity of public institutions to advise and support local public authorities in implementation PPP (Zagozdzon 2013). • clear project brief and design development (Jamali 2004) • implementation units (Jamali 2004; Azis 2004); • good feasibility studies (Mladenovic et al 2013) • streamline approval process (Jefferies 2002) • transparency of PPP process (Azis, 2004; Jacobson & Choi, 2008); Tam, 1994); • standardization procedure (Azis 2004; Tam 1994)	• the failure of procurement process (Estache & Saussier 2014) • the challenges of matching the contractual choice with the institutional to supervise and arrange PPP contract (Estache & Saussier 2014) • inadequate decision making process (Morris 1990) • inappropriate organizational structure of public sectors (Morris 1990) • improper contract planning (Yang et al 2010) • longer negotiation & signing of contract agreement (Yang at al 2010)

How can governmental PPP support affect the project being on time and within budget?

The government may issue specific policies regarding the tendering process and contract design like risk allocation and guarantees. Clear PPP programs with a significant project pipeline and timetable will guide both public and private sectors to conduct the procurement process. A stable political support for PPPs will guarantee the private sector actors their return on investment as well as the sustainability of projects. Therefore, this dimension is vital for running the projects to meet the objective of the delivery of project on time and within budget.

PPP-specific regulations generally serve to define the PPP definition, sectors and types, the competent contracting authorities and the eligible private party. This also includes the procedures for selection of the private partner through competitive bidding, review procedures, guarantees and so on. The presence of

[33] Most of them refers to transport infrastructure -in general.

PPP regulations (also procurement law) is deemed to reinforce the contract, and to encourage the delivery projects being on time and within budget. Conversely, without comprehensive regulations, there is no clear guidance for both the public and private sector to manage the project properly.

The implementation of policies as well as regulations is affected by the presence supporting arrangements like the existence and roles of a dedicated PPP unit, procedures for project appraisals as well as standardized process and documents. First, PPP units have a central role in policy guidance, green lighting, capacity building, so they may scrutinize the development of projects from initiation to implementation. Second, a standardized ex-ante evaluation instrument is needed to assess the feasibility of specific projects not only prior and during the tendering process, but also before signing the contract. Finally, standardized processes and contract documents may stimulate the continuous improvement of the project implementation.

We expect that projects developed in countries with well-established governmental PPP support in terms of policies and political support, regulations and supporting arrangements, will enhance the delivery of projects being on time and within budget.

Micro-level factors

Considering empirical studies, the factors contributing to project success and failure are affected by micro-level or project factors[34]. This study mainly focuses on the following factors: the quality of tendering process, the level of optimisation of the financing scheme, the appropriateness of risk allocation and the role of government guarantees.

Quality of the tendering process

The quality of tendering processes is one of the most substantial factors for delivering PPP project success, because it will improve efficiency (Estache & Saussies 2014). It requires well-structure processes, an appropriate evaluation method and a set of objective criteria (Miller et al. 2000). The quality of the tendering process is mostly affected by the level of competition (Qiao et al, 2001; Dixon et al, 2005), where the low level of competition may bring about a sub-optimal solution regarding the selection of partners (Li, et al, 2005). The transparency and accountability issue has particularly emerged as a sensitive issue in PPP tendering processes (Garvin, 2010). A good design of the procurement process in order to minimizing risk of corruption or collusion is certainly required (Estache & Saussier 2014). Conversely, there are some factors leading to project failure in terms of high transaction cost and lengthy lead time (Chan et al. 2010). *We argue that a high-quality tendering process allows us to select the best partner that has a good capacity, capability and expertise in financial, technical and administrative terms enabling them to manage the project life-cycles properly. Therefore, a good tendering process which allows us to select the best private partners, will promote the delivery of projects on time and within budget. Conversely, a low quality of tendering process leading to high transaction costs might cause delay in the project implementation or construction as well as costs being over budget.*

Financing scheme

The financing scheme can be considered an important factor for delivery of project success (see Khmel & Zao 2015; Osei-Kyei & Chan 2015). Failed projects (i.e. cost overrun and delay), are often characterised

[34] Based on literature, project governance can refer to elements like a strong private consortium, trust and commitment, effective management control, good coordination, good project management and suitable and skills experience and so on.

by an inappropriate financing scheme (see for example: Flyberg et al. 2003, Morris 1990); as well as problems in financing and payments (Kaliba et al 2009; Yang et al 2010). According to Nevitt and Fabozzi (2000), the key to a successful project financing is to structure the financing of a project with as little recourse to the sponsor as possible, while at the same time lenders are satisfied with sufficient credit support (Ye, 2009). The capital structure of a PPP infrastructure project can differ in terms of: (1) types of financial instruments (i.e. equity, debt, mezzanine finance); (2) the sources of the financial instruments, including international financial institutions, commercial banks, different types of equity participants, and the general public; and (3) the corresponding contractual conditions with respect to these financial instruments e.g., grace period and repayment period of debt, and government loan guarantees (Zhang, 2005). According to Ye (2009), debt capital is 'cheaper' than equity as it is less risky than equity. However, it has a lower level of return, because debt holders have a prior claim to revenue and asset and debt financing has covenants governing some of the management's actions.

How can the capital structure be optimised? The optimisation of capital structure mainly has to do with financial sources, ratios of different types of funds, and timeframe of fund usage. First, as the expected return on equity is higher than the return on debt, the relative shares of debt and equity in the total financing package have important implications for the cash flow of the project. A higher proportion of debt, however, requires larger cash flow for debt servicing. This could be problematic, particularly in the early years of project operation when the revenue earnings are generally low (i.e. typical situation faced by transport projects). In such a case, the risk of default would be considered high (Ye, 2009 in Akintoye & Beck, 2009; see also Kwak et al. 2009). Accordingly, the private sectors should carefully consider an optimal composition between debt and equity in terms of financing risk. As academics as well as practitioners suggest, this optimal composition may refer to specific proportions of equity and debts around 20%-30% equity and 70%-80% debts (Zhang, 2005; Engel et al, 2014; Cutarree & Mandri-Perrot 2011; HM Treasury, 2012; EIB 2012).

Second, an equity financing consisting of subordinated debts is provided by sponsors, and sometimes by institutional investors, the host government and the public. Debt financing may be provided by a syndicate of commercial banks, financial institutions, export credit agencies, international agencies (e.g. the World Bank, Asian Development Bank, etc.), and so on. The optimal capital structure should meet the fund providers' risk and return trade-offs through appropriate financial instruments such as commercial bank loans, export credit financing, various notes or bonds (Ye, 2009 in Akintoye & Beck, 2009).

Zhang (2005) points out that in countries with weak economies and/or a lack of an adequate legal environment, lenders may require sovereign guarantees from the project's host government and/or involvement of the Export Credit Agencies and multilateral agencies such as the World Bank, the Asian Development Bank, and the International Finance Corporation in order to cover political and economic risks. The involvement of international institutions increases the confidence of the commercial banks in the project, and they may reduce the interest rate of debt. This reduced cost of debt increases the project's financial viability. To do so, the strength of financing scheme is hence depending upon two dimensions, being (a) the type and optimal composition of financial instruments and (b) the sources of financial instruments.

A strong and optimal project financing is vital for the success of projects to cover the project during the implementation stage. The ideal-type financing scheme refers to the sources of project financing (multilateral bank versus commercial banks) and an optimal composition of financial structure (debt and equity). This may imply finance being available when needed and project cash flow being sufficient for expected payment in the project implementation. Therefore, we expect the presence of an optimal

financing scheme will significantly contribute to the delivery of PPP projects being on time and within budget. On the contrary, when the capital structure is dominated by debts, it may lead to financial problems in terms of the project cash flow. Thus, this situation can lead to the projects experiencing time overrun as well as cost overrun.

Risk allocation

The risk allocation is a crucial factor for successful PPP projects (Bing, L. et.al, 2005; Iossa, 2007,2012; Motta & Meira, 2015). In this context, Iossa et al. (2007, 2012) point to the goals of risk allocation: (1) to offer incentives to complete the project on time and within budget (see also Flyberg et.al, 2002); (2) to provide incentives to reduce the long-term cost of a project; (3) to provide incentives to improve the quality of services and revenues yield (Mota & Moreira (2015), Bing, Li et al (2005); Qiao et al (2001); Grant (1996); and (4) to insure the risk-averse public and private partners against risk (Iossa et.al, 2007). For instance, the allocation of construction risks to the private sector reduces the chance of occurring cost overruns and project delays which often characterise public works (Flyberg et al., 2002). However, risk transfer to the private sector may increase value for money, but only up to the point that it creates the incentives for the private partner to improve efficiency (OECD, 2010). Conversely, according to Finnerty (1996), without an appropriate sharing of risks and an opportunity for the private partner to earn a fair rate of return on its investment, a partnership is likely to fail (see also Li et.al, 2000). Risk misallocation is a substantial factor for project failure, for example: cost of unforeseen service and utility, unforeseen ground condition, force majeure, etc. Empirical studies also show that the failed projects are caused by insufficient mitigation of risk (Odeyinka & Yusif, 1997; Flyberg et al, 2003; Bain, 2003,2009; Doloi, 2012).

Infrastructure projects are considered vulnerable to external factors. A PPP contract with a more appropriate risk allocation allows projects to deal with unexpected events referring to unconducive macro-institutional and economic conditions like economic downturn, changes in regulations and political support and other factor like force majeure that influence ongoing projects. Thus, in line with Iossa et al. (2007; 2012), we expect that a more appropriate risk allocation will contribute significantly to the delivery of project on time and within budget. Conversely, a misallocation of risk (like a force majeure, which is normally shared with the public partner, but being allocated to the private partners) will cause an inappropriate mitigation of risks and will interrupt the project implementation. As a result, the projects will need more time to recover and thus projects will experience time overrun and also cost overrun.

Government guarantee

When unexpected events and a contract renegotiation arises, the government needs to come up with a mix of government actions that ensures an acceptable financial return can be generated - the rate of financial return of the PPP has to cover its cost of capital, so a government guarantee is needed (Irwin, 2006). Similarly, Voordijk et al. (2016) highlight that the government providing guarantees are triggered in times of unfavourable economic conditions when many projects experienced much pressure for managing their activities. Government guarantees also aim to cover the viability gap fund. Moreover, a redesign of financing scheme may also include government guarantees (Engel et al 2001). In addition, under the Global Financial Crisis, a ‘standard risk allocation’ was not sufficient to satisfy the private sector and hence the use of state guarantees in support of PPP bankability and attractiveness to financial investors has been suggested (EPEC, 2014). The government provides guarantees for taking on certain contingent

liabilities or uncertain future events of the project. Government guarantees can be provided into different categories: (1) finance guarantees (i.e. loan guarantees, refinancing guarantees, exchange rate, convertibility of local currency) and (2) PPP contract provisions (i.e. revenue/usage guarantees, minimum service charge guarantees, change of law/regulation undertakings, termination payments, residual value payments) (EPEC 2014; see also Delmon 2011). *Being a common form of government guarantees, debt guarantees are expected to cope with the situation where the private partner fails to pay back the debts to the lenders. Therefore, it may guarantee the financial needs during the implementation stage and hence contribute to the delivery PPP projects on time and within budget. However, the financial crisis might worsen the financial problem to pay back the loans during the implementation stage. It will obstruct the on-going projects, because the construction of projects cannot be executed as planned. As a result, the projects will experience delay of completion and hence cause an additional cost like increasing interest charges, thus leading to cost overruns.*

As said before, we expect that the macro-, meso- and micro-level factors will interact with each other when affecting PPP projects being on time or on cost. They may strengthen or weaken each other's effect on cost and on time outcome. For example, a country with a more favourable macro-institutional and economic-financial context (i.e. high level of country competitiveness) might be assumed to have a more well-developed governmental PPP support scheme, which in turn could improve the choices made in terms of financing scheme, risk allocation, tendering process and government guarantees.

We then formulate propositions referring to the interaction of macro, meso and micro-level factors as follows.

Proposition 1: *Having high levels of country competitiveness, high levels of governmental PPP support and a more optimal financing scheme, a high quality of tendering process for selecting the best partners, a more appropriate risk allocation and more government guarantees, individually or jointly will lead to PPP projects being on cost and on time.*

Proposition 2: *On the contrary, low levels of country competitiveness, low levels of government support, a less optimal financing scheme, a low quality of tendering process, a less appropriate risk allocation and less government guarantees, individually or jointly will lead to PPP projects being over cost and delayed.*

6.3 Data and methodology

a. Data and case selection

This chapter seeks to explain project success in terms of on time and within budget among a sample of PPP projects in transport infrastructure within different European countries, using fsQCA. In studies using QCA methodology cases are not randomly selected as in statistical studies, but carefully defined and chosen so as to maximize diversity on factors of interest and to minimize variation on other factors (Yamasaki & Rihoux 2009). Data was collected within the HORIZON 2020 research project BENEFIT and the COST Action TU1001. 37 PPP projects in 12 different European Countries[35] studied in BENEFIT and COST TU1001 are included as cases, allowing variation on different aspects: (1) the outcome of project success or failure should be quite varied across projects; (2) the level of governmental support at the time of contract closure should also vary across countries. (3) the level of country competitiveness

[35] We selected projects in the following countries: Greece, Italy, The UK, Portugal, Spain, France, Norway, Belgium-Flanders, Cyprus, Finland, and Czech Republic. These countries represent considerable variation in both levels of country competitiveness (Schwab and Sala-i-Martín 2014) and governmental PPP support (Verhoest et al. 2015).

should also vary, implying the projects being developed in different macro-institutional and economic situations; (4) the value of micro-level conditions should also show sufficient variation.

b. Methodology

To select the conditions for our analyses, a comprehensive approach is applied[36] (Yamasaki & Rihoux, 2009). We collected and analysed relevant publications in order to look for factors contributing to project success (failure). This literature is discussed in earlier sections of this chapter.

We use Fuzzy set Qualitative Comparative Analysis (fsQCA)[37] to analyse the effects of the selected conditions on the outcome of project success (failure). The method allows us to see which conditions are necessary and sufficient to bring about a certain outcome.

There are three reasons/arguments why QCA is used. First, a fuzzy-set QCA is highly appropriate for analysing medium N cases (12 to 70 cases). Previous research has pointed out the benefits of using (fs)QCA on a medium-sized dataset, compared to traditional regression analysis (Vis, 2012). Second, a QCA allows us to test hypotheses or existing theories. More specifically, the researchers aim at operationalizing theory or hypotheses as explicitly as possible by defining a series of conditions that should yield a particular outcome (Rihoux & Ragin, 2009). Third, QCA forces researchers to achieve conceptual clarity through the calibration procedure, in which cases are assigned to sets (Schneider & Wagemann, 2010).

The combined QCA and process tracing (PT)

Schneider & Rohlfing (2013) point that the process tracing is an invaluable complement for QCA in order to discern the causal mechanism behind a set-relational pattern and in order to further improve the theory and the QCA model. However, we only focus on post-QCA process tracing, as it can rely on QCA results for the choice of typical and deviant cases, which is impossible in pre-QCA research. First, model-related reasons can only be investigated once a model has been established with a QCA based on a well-crafted truth table. Second, post-QCA process tracing is based on a broader empirical basis because it draws on multiple truth table rows, whereas pre-QCA analysis is limited to a single row. Third, pre-QCA case studies tend to focus more on deviant cases with regards to consistency when investigating contradictory truth table rows, whereas in post-QCA process tracing the distinction between deviance in consistency and coverage is crucial. Lastly, in post-QCA, the differences between the statement of necessity and sufficiency are fully taken into account (Schneider & Rohlfing, 2013).

c. Operationalization and method of calibration

In this section, we define, measure and calibrate both outcome and conditions as follows (see also Annex J Table J.1).

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[36] According to Yamasaki & Rihoux (2009), the selection of conditions can be based on six approaches: (1) the comprehensive approach, where the full array of possible factors are considered in an iterative process; (2) the perspective approach, where a set of conditions representing two or three theories are tested in the same model; (3) the significance approach, where the conditions are selected on the basis of statistical significance criteria; (4) the second look approach, where the researcher adds one or several conditions that are considered as important although dismissed in previous analysis; (5) the conjunctural approach, where conditions are selected on the basis of theories that are conjunctural or combinatorial in construction and that predict multiple causal combinations for one outcome; and (6) the inductive approach, where conditions are mostly selected on the basis of case knowledge and not on existing theories.

[37] We use fsQCA 2.5 software. However, to check the consistency of the results, the newest fsQCA software (fsQCA 3.1) is also applied. Also, in order to ensure the accuracy of the results, we also re-do the analysis using the newest version of R software (R.3.61). By comparing these three softwares, which may yield small differences, the results are more robust than when using a single software.

Outcome

As part of 'the iron triangle', the success criteria is defined as projects being delivered (constructed) on time and within budget. The outcome data is provided for the BENEFIT projects and coded as follows: score -1 (above cost or delay), 0 (within budget or on time) and 1 (below cost or ahead of schedule). The 'on cost' outcome has three callibrated values: (0) cost overrun (i.e. over budget), (0.8) on cost or within budget, and (1) below cost (i.e. below budget). Similarly, the 'on time' outcome is calibrated into: (0) delay (over time), (0.8) on time, and (1) ahead of the schedule (ahead of time).

Conditions

(1) The level of country competitiveness

Being a proxy of the business environment in a certain country, we use the Global Competitiveness Index (GCI) developed by the World Economic Forum (Schwab and Sala-i-Martín 2014), which is available for every year since 1997 onwards and which has been used by academics and practitioners (See e.g. Pérez-Moreno et al. 2015). The GCI includes a macro-economic pillar, capturing the government budget balance, gross national savings, inflation, general government debt and the country credit rating, as well as a financial market development pillar, measuring among others the availability and affordability of financial services, ease of access to loans, soundness of banks, and venture capital availability. But this index includes also information on the institutional-political context, with proxies for rule of law, corruption, and government efficiency, among others. Furthermore, it refers to contextual elements and policies, supporting investments and economic activity, like labor market efficiency, technological readiness, health and education, market size, business sophistication and innovation in a country. The GCI encompasses 12 pillars and is calculated based on a weighted average of sub-indicators. Just like other composite global governance indicators, the GCI has been criticized in terms of methodology and underlying theoretical model (see e.g. Lall 2001) which have not been fully dealt with in later refinements. However, its comprehensiveness and availability are an asset in this chapter.

The value of GCI is calculated by taking an average value at the moment of contract closure and contract completion or the first inauguration. This single value (1 to 7) is then normalised to a total score on a scale between 0 and 1. To assign set membership for the fsQCA, we used direct calibration. Based on a review of the GCI score in the 11 European countries from 2001 to 2014, we found an average around 0.60 and the lowest and the highest score are 0.40 and 0.80 respectively. We then set the following thresholds: 5% percentile being the threshold for non- membership = 0.40; 50% percentile being the cross over point = 0.60 and 95% percentile being the threshold for full membership = 0.80.

(2) Governmental PPP support (PPP-GS) and its sub-dimensions

The governmental PPP support is measured, following Verhoest et al. (2015), by sub-indicators related to three dimensions, being PPP-enhancing policies and political commitment, PPP-enabling legal and regulatory frameworks and supporting institutional arrangements. The value of the sub-indicators varies between 1 (the lowest) and 4 (the highest). The data on governmental PPP support per country as used in this chapteris collected by country teams as part of the BENEFIT case template per project at the moment of contract closure. Second, the data was then validated by cross-checking it with other

sources such as the COST Action TU1001 country templates and narratives, as well as data from EPEC (2014) and EBRD (2012). To preserve the accuracy of data, we also apply an alternative procedure by using the 2013 value as a benchmark (see Verhoest et al. 2015) and tracing changes in the years before up to the moment of inauguration/completion. In order to avoid problems by using a composite index, we performed hierarchical cluster analysis on the set of sub-indicators, resulting in six clusters which were ranked from low to high (see Soecipto et al. 2016).

Hence, we calibrate 'governmental PPP support' as condition into a six-value set membership as follows: (1) Cluster 1 scores 1 (fully in), (2) Cluster 2 scores 0.8 (mostly, but not fully in), (3) Cluster 3 scores 0.6 (more or less in), (4) Cluster 4 scores 0.4 (more or less out), (5) Cluster 5 scores 0.2 (mostly, but not fully out), and (6) Cluster 6 is allocated the value 0 (fully out).

For the second analysis in which we study the influence of the three sub-dimensions of governmental PPP support, we also applied hierarchical cluster analysis to these sub-dimensions[38].

(3) The quality of tendering process

In order to measure the 'quality of tendering process', we developed, based on literature, a scoring model (see Annex 3). The quality of tendering processes is measured by four main indicators of the following governance principles being *fair-non-discriminative nature, competition, transparency in procedure and timeliness/speed of the tendering procedure* (see table N in Appendices). The first indicator reflects to what extent information about the tendering process can be accessed easily by all bidders, so the highest quality refers to open tendering procedures. A *competitive procedure* is deemed to be crucial for selecting the best partners, this indicator refers to what extent the tendering process can provide for a high level of competitiveness among bidders. Based on empirical studies, a high level of competitiveness is achieved in case the tendering process involves at least four bidders (Liyanage & Villalba, 2015; Vordijk et al, 2015; Zhang, 2004; Dudkin & Valila, 2005; Estache et al, 2008; Roumboutsos & Sciancalepore, 2014; World Bank & PPIAF 2012). The third indicator points to the importance of a *transparent procedure* in each step from inviting bidders to announcing the final winner and refers to the complexity of the procedure. Finally, the *speed or timeliness* refers to the time from tender notice to contract closure. Taking into consideration empirical studies, we assess that a tendering process lasting less than two years is considered high quality (Liyanage & Villalba, 2015; Voordijk et al, 2015; Grimsey & Lewis, 2007; Reeves et al, 2013.

Theoretically, the tendering process score varies on these four indicators between 1 (the lowest) and 4 (the highest). To aggregate and calibrate this score, we apply hierarchical cluster analysis with 4 clusters[39]. Thus, a four value fsQCA comprises: (1) Cluster 1 score 0.8 (mostly, but not fully in); (2) Cluster 2 scores 0.6 (more or less in); (3) Cluster 3 scores 0.4 (more or less out); and (4) Cluster 4 scores 0.2 (mostly, but not fully out).

[38] We used six value QCA of the dimensions governmental PPP support, but reserved the highest cluster and the lowest cluster, because each dimension had different characteristics and in fact, there was no single project having high (low) levels in all sub-dimensions. These dimensions were then calibrated as follows; (1) Cluster 1 scores 0.8 (mostly, but not fully in), (2) Cluster 2 scores 0.6 (more or less in), (3) Cluster 3 scores 0.4 ((more or less out), (4) Cluster 4 scores 0.2 (mostly, but not fully out).

[39] As our empirical studies regarding the quality of tendering process of 38 PPP projects in 16 European countries show, when classifying into six groups being (1) 1-1.5; (2) 1.5-2.0; (3) 2-2.5; (4) 2.5-3.0; (5) 3-3.5 and (6) 3.5-4,0, there are no projects having both the lowest score (1-1.5) and the highest score (3.5-4.0). Accordingly, we then cluster them using four values of QCA

(4) Financing scheme

We argue that the strongest financing scheme can be generated by an optimal capital structure and by predominantly public debts or debts coming from multilateral banks (i.e. EIB, EBRD, IBRD) in terms of their sources in order to have less financial risks. The operationalization of financing scheme is divided into six categories and calibrated using six values: (1) a financing scheme with the most optimal structure (70% ≤ debts <80%) and financed by predominantly public debts or multilateral banks, scores 1 (fully out).; (2) a financing scheme with the most optimal structure (70% ≤ debts <80%) and financed by predominantly private debts scores 0.8 (mostly but not fully out); (3) a financing scheme with a moderately optimal structure (60% ≤ debts ≤70%) or (80% ≤ debts ≤ 90%) and financed by predominantly public debts or multilateral banks, scored 0.6 (more or less out); (4) a financing scheme with a moderately optimal structure (60% ≤ debts ≤ 70%) or (80% ≤ debts ≤ 90%) and financed by predominantly private debts scores 0.4 (more or less in); (5) a financing scheme with the least optimal structure (debts < 60% or debts > 90%) and financed by predominantly public debts or multilateral banks, gets score 0.2 (mostly but not fully in), and (6) a financing scheme with the least optimal structure (debts < 60% or debts > 90%) and financed by predominantly private debts scores 0.0 (fully out).

(5) Appropriateness of risk allocation

During data collection in the BENEFIT project, country teams mapped the actual allocation of risks for each transport infrastructure PPP to the public partner, private partner or being shared between both. We take into account five major risks which most probably influence the delivery project success, namely: design, construction, financial, regulatory and force majeure risks.

The 'appropriateness of risk allocation' is measured by the conformity of the actual risk allocation with the standard risk allocation, taking into account the type of project, as suggested by literature and empirical studies (Carbonara et al, 2015; Iossa et al. 2007; Grimsey & lewis 2004; Marquez & Berg 2010; Li et al. 2005; OECD 2008; Ke et al. 2010). In case of Build-Operate-Transfer contracts, a standard risk allocation would keep most risks with the public partner, but the private partner should bear the construction risk. Conversely in case of Design-Build-Finance-Operate/Manage contracts, most risks on DBFO contract would be standardly born by the private partner, but regulatory risk should be retained by the public partner. Moreover, financial and force majeure risk should be shared between public and private sectors (Iossa et al., 2007). We then calibrate the different values using indirect calibration with six values: (1) 'all risks are appropriately allocated' scores 1.00 (fully in) (2) '4 out of 5 risks are appropriately allocated' scores 0.8 (mostly but not fully in), (3) '3 out of 5 risks are appropriately allocated' scores 0.6 (more or less in), (4) '2 out of 5 risks are appropriately allocated' scores 0.4 (more or less out), (5) 'only 1 of 5 risks is appropriately allocated' scores 0.2 (mostly but not fully out), and (6) 'no risk is appropriately allocated' scores 0.0 (fully out).

(6) Government guarantees

In general, the government can provide guarantees in two forms, being either a full guarantee related to all project development phases (both construction and operation⁄maintenance) or a partial guarantee related to either the construction or operation⁄maintenance phase. However, as we focus on analysing the cost and time outcome, we only take into account the construction phase. Therefore, this condition

is calibrated using three values: (1) a full guarantee provided[40] (fully in) scores 1.0, (2) a partial guarantee for the construction phase is scored 0.8 (more in than out); and (3) no guarantee provided at all (fully out) scores 0.0.

6.4 Result of the fuzzy-set Qualitative Comparative Analysis (fs QCA)[41]

a. PPP Governmental support in general

1) On cost project delivery as outcome

We first conduct the necessity analysis (Annex K Table K.1). There proves not to be a necessary condition to explain the presence and absence of the outcome 'on cost'. We now turn to the analysis of sufficient conditions[42] (see table 23). Truth table of this analysis is depicted in the annex L and table L1.

Table 23: Solution formula of outcome: On cost

Solution terms	Outcome: Presence of on Cost (within budget)		Outcome: Absence of on Cost (cost over-run)		
	Solution 1	Solution 2	Solution 1	Solution 2a	Solution 2b
	~PPP*GUA*FIN	COMP***PPP*~GUA* FIN**	**PPP*~FIN* GUA**	**~COMP*~PPP*** ~TEND***~GUA**	**~COMP*~PPP** *~FIN***~GUA**
Consistency	0.81	0.81	0.83	0.91	0.85
Raw coverage	0.25	0.29	0.40	0.23	0.24
Unique coverage	0.19	0.23	0.27	0.02	0.03
Projects	A22 Algarve, Athens Airport, Larnaka Port E18Muurla-Lohja, Lusoponte-Vascoda Gama Bridge	Liefkenshoekspoorver binding, BNRR (M6TOLL), M80 Haggs, A19 Dishforth M-45 SERVICI, M-25 Motorway	Central Greece, Radial2, Eje Aeroporto, Elefsina Korinthos, Metro de Malaga, Moreas Motorway, Barcelona Europe	BreBeMi	Horgos Pozega
Overall solution consistency	0,83		0,84		
Overall solution coverage	0,49		0,53		
N	37		37		

Note: The table includes only the intermediate solution terms. The conditions that are in bold are core conditions which are included in the parsimonious solution terms

The analysis of the sufficient conditions for the presence of on cost results in an overall solution consistency of 0,83 and almost a half (0.49) of outcome is explained by the found solution formulas. Four configurations represent the formula as follows.

$$\sim PPP*GUA*FIN + COMP*PPP*\sim GUA*FIN \rightarrow ON\ COST$$

[40] In most cases, the government may also provide guarantee in the operation and maintenance phases for example: minimum revenue guarantee, when revenue come from overall projects might not sufficient enough to cover the project financing. But, this operational guarantee has no significant effect on the construction phase, so we calibrate it with a slight difference between a full guarantee (1.0) and guarantee for the construction phase (0.8).

[41] We employ the fsQCA 3.1 software. When it is compared to fsQCA 2.5, this software is considered more valuable in terms of the process as well as the results. In order to obtain the best solution formula and fulfil the transparency in reporting, we also conduct the analysis using other software (R-software 3.1.6)

[42] Several arguments substantiate the cut-off consistency ratio: (1) it is well above the lowest 'permitted' value of 0,75; (2) the high PRI (Proportional Reduction in Inconsistency) scores (see Schneider and Wagemann, 2012) indicate a big difference between the configuration's consistency scores for positive outcome and negative outcome (the cut off 0,60 is considered high); (3) the cut-off point is substantiated by the examination of the cases covered by the configuration (Verweij, 2015 see also Ragin, 2009; Schneider and Wagemann, 2012).

The model can be elucidated into two findings. First, the projects were delivered on cost in our sample, if they rely upon more optimal financing scheme (FIN), in countries which has a less well-developed PPP governmental support (~PPP) but with a government providing guarantees (GUA) (solution 1). Second, projects having lower financial risk in terms of their capital structure (FIN), in a country context which is favourable (COMP) and with high levels of governmental PPP support (PPP), are delivered on cost, even when they have no government guarantees (~GUA) (solution 2). Hence, a conducive macro-institutional and macro-economic (macro-level) and governmental PPP support (meso-level) are mutually reinforcing for the delivery of on cost projects and at the same time, a more optimal financing scheme (micro-level) compensates for low levels of governmental PPP support (meso-level) in order for projects being on cost. Interestingly, the existence of government guarantees is more likely to deliver on-cost projects even in countries that have a weakly developed governmental PPP support or the opposite. The strongest path shows as combined conditions having a more optimal financing scheme and a more appropriate risk allocation, in countries with high level of competitiveness and high levels of governmental PPP support and without government guarantees (see solution 2). This combination is found in six PPP projects.

If we perform the sufficiency analysis on the PPP projects which have failed to achieve success and hence experience a cost overrun (see Table 23, right column), we get rather robust results with a moderate consistency and a rather high coverage ratio, being respectively 0.84 and 0.53. The configuration looks as follows.

$$PPP*\sim FIN*GUA + \sim COMP*\sim PPP*\sim TEND*\sim GUA + \sim COMP*\sim PPP*\sim FIN*\sim GUA \rightarrow \sim ON\ COST$$

Having a more well-developed governmental PPP support as well as providing government guarantees (GUA) does not safeguared projects from cost-overruns, when these projects are financed by less optimal financing scheme or more financial risk of their capital structure (~FIN) (solution 1). The projects also experienced cost overrun, in case they were developed in a country with less conducive macro-institutional and economic context (~COMP) and less well-developed governmental PPP support (~PPP) and without government guarantee (~GUA) and either low quality of tendering process (~TEND) (solution 2a) or a less optimal financing scheme (~FIN) (solution 2b). The strongest path (see solution 1) explains several roads and non-roads projects in Greece (i.e. Central Greece, Elefsina K, and Moreas) and Spain (Radial 2, Eje Aeroporto, Metro de Malaga and Barcelona Europe).

Thus, having a well-developed governmental PPP support can on the one hand help to deliver on cost projects under specific conditions, but on the other hand, PPP projects can be on cost even when a well-developed governmental PPP support is missing given that other conditions are present (government guarantees and an appropriate financing scheme). Moreover, a weakly developed governmental PPP support might in combination with other conditions trigger cost overrun. But a well-developed PPP support does not protect projects against cost overruns, even in combination with government guarantees, in case an appropriate financing scheme is missing. These results do not support the proposition 1. However, results partially confirm proposition 2 referring to solution 2a and 2b.

2) On time project delivery as outcome

We first conduct the necessity analysis (Annex K Table K.1). There is no necessary condition to explain the project being both presence and absence of the outcome ‘on time’. As to the sufficiency analysis (truth table see table L2) showing a relatively high consistency ratio and coverage ratio (0,87

and 0,51 respectively) and three configurations of explaining on time projects represent the formula as follows.

$$\sim COMP*FIN*GUA + COMP*PPP*\sim TEND*FIN + TEND*FIN*RISK*GUA \rightarrow ON\ TIME$$

The projects are delivered on time (table 24, left side), if they depend on a more optimal financing scheme (FIN), in a country with a government providing guarantees (GUA) even if the involved country has low levels of competitiveness (~COMP) (solution 1). Also, having a more secure financial structure (FIN) in countries with high levels competitiveness (COMP) and with high levels of government support (PPP), but with a tendering process of low quality, can produce on cost delivery (solution 2). Finally, the projects being on time can also be explained by combined micro-level factors in terms of a high quality of tendering process (TEND), a more optimal financing scheme (FIN), a more appropriate risk allocation (RISK) and government guarantee provided (GUA) (solution 3). The strongest path shows the interplay of all micro-level factors (solution 3), which is found in Brabo 1 (Belgium), Metrolink LRT (The UK), Athens Airport (Greece) and E18 Muurla-Lohja (Norway). The first two paths do not support proposition 1, whereas the latter path partially lends support to proposition 1.

When analysing the absence of on time (table 24- right side), we found two solution formula referring to three parsimonious solutions with quite high overall consistency and coverage value 0,87 and 0,41 as follows.

$$\sim COMP*\sim GUA*(\sim FIN + \sim PPP*\sim TEND) \rightarrow \sim ON\ TIME$$

The delayed projects occur in countries with unfavourable conditions (~COMP) and without government guarantees (~GUA) and have either less optimal financing scheme (solution 1a) or a weakly governmental PPP support (~PPP) and a low quality of tendering process (~TEND) (solution 1b). These results confirm the proposition 2 to a high extent, even though the configuration does not include the absence of an appropriate risk allocation.

Table 24: Solution formula of outcome: On time

Solution terms	Outcome: Presence of on Time			Outcome: absence of on Time (Delay)	
	Solution 1	Solution 2	Solution 3	Solution 1a	Solution 1b
	~COM*FIN*GUA	COMP***PPP*** **~TEND*FIN**	TEND***FIN*** **RISK*GUA**	**~COMP*~**FIN*** **~GUA**	**~COMP*~**PPP*~ TEND***~GUA**
Consistency	0.85	0.80	0.89	0.86	0.95
Raw coverage	0.28	0.27	0.31	0.38	0.24
Unique coverage	0.05	0.14	0.08	0.17	0.02
Projects	A22-Algarve AthensAirpor, LarnakaPort , Lusoponte-Vasco da Gama Bridge , MUELLE COSTA	BNRR(M6TOLL) M80Haggs A19Dishforth	Brabo, MetrolinkLRT, AthensAirport, E18Muurla-Lohja	Piraeus Container, Horgos Pozega	BreBeMi
Overall solution consistency	0.87			0,87	
Overall solution coverage	0.51			0,41	
N	37			37	

Note: The table includes only the intermediate solution terms. The conditions that are in bold are core conditions which are included in the parsimonious solution terms

b. Which sub-dimensions of governmental PPP support matter in interaction with macro- and micro-level conditions?

But if governmental PPP support plays a role, is this due to the joint effect of its three sub-dimensions, being the presence of PPP-enhancing policies and political commitment, a PPP-specific legal and regulatory framework or well-developed PPP-supporting arrangements? Do they strengthen each other when leading project success?

To do so, we then run a second analysis in which we include the three dimensions of governmental PPP support. However, due to the requirement of compatibility in terms of number of cases and conditions involved in QCA methods (see Marx & Dusa 2011), two conditions should be removed and replaced with new ones. By using process tracing, we learned that the quality of tendering process has no significant effects for explaining project success and the condition 'government guarantees' only has an effect on explaining the on-time outcome. We have run the analysis with three dimensions of governmental PPP support, while leaving 'quality of tendering process' and 'government guarantees' out of the anaysis. Unfortunately, PPP-enhancing policies as well as PPP-specific legislation strongly weaken the configurations for explaining both on cost and on time. We then re-run the analysis using government guarantee as a condition while removing PPP-specific legislations because of three reasons: (1) in fact, there is little variation in terms of PPP-specific legal and regulatory framework in our sample; (2) as mentioned above, the condition 'government guarantees' has clear effects to deliver the on-time outcome; and (3) in many cases, the presence of government guarantees may also overlap with the presence of 'PPP legislation' as dimension of governmental PPP support, because government guarantees are often made possible by provisions in PPP legislation.

As Table 25 (left side) shows, the projects are delivered on cost if they depend upon a more optimal financing scheme (FIN) and having government guarantees (GUA) even when the involved projects have been developed in countries with weak PPP-enhancing policies (~POL) (solution 1). But the other solution paths show the relevance of the sub-dimensions of PPP-enhancing policies and PPP-supporting arrangements for delivering projects on cost: a substantial group of 'on cost projects' were developed in contexts with a high developed PPP supporting arrangement (SUPP), strong PPP-enhancing policies (POL) and a high level of competitiveness (COMP), even without guarantee (~GUA), but combined by either a more optimal financing scheme (FIN) or a more appropriate risk allocation (RISK) (solution 2a and 2b). The strongest path (solution 2b) shows that projects with a more optimal financing scheme (FIN) in countries with favourable situations (COMP) and high levels of PPP-enhancing policies (POL) and PPP-supporting arrangements (SUPP) and a more appropriate risk allocation, even without government guarantees, are also on-cost. In addition, the found paths learn us that the presence (absence) of government guarantees seems to compensate for the absence (presence) of PPP-supporting arrangements. The latter is a core-condition in two paths.

On the contrary, projects experience cost overrun when they are developed in countries which have low levels of PPP-supporting arrangements (~SUPP), even in the presence of PPP-enhancing policies (POL), and when they depend upon either a less optimal financing scheme (~FIN) (solution 1) or a more appropriate risk allocation (RISK) and no government guarantees (~GUA) and low levels of country competitiveness (~COMP) (solution 2). A less well-established supporting arrangement is a core-condition for explaining projects with cost over-run. Truth table is presented in table L3 annex L.

Table 25: Solution formula of outcome: On cost

Solution terms	Outcome: Presence of on Cost			Outcome: absence of on Cost (Cost Over-run)	
	Solution 1	Solution 2a	Solution 2b	Solution 1	Solution 2
	~POL*FIN*GUA	COMP*POL***SUPP***FIN***~GUA**	COMP*POL***SUPP***RISK***~GUA**	**POL*~SUPP*~FIN**	~COMP***POL*~SUPP*RISK***~GUA
Consistency	0.79	0.81	0.84	0.82	0.84
Raw coverage	0.27	0.26	0.28	0.55	0.32
Unique coverage	0.17	0.02	0.13	0.26	0.03
Projects	A22 Algarve, Athens Airport, Larnaka Port, E18 Muurla-Lohja, Lusoponte	BNNR (M6 Toll), M80 Haggs, A19 Dishfort, Liefkenhoekspoorverbinding, M-25 motorway	Via Invest Z, BNNR (M6 Toll), M-25 motorway	Radial-2, Eje Aeroporto, Metro de Malaga, C-16 Terrassa Barcelona Europe	BrebeMi
Overall solution consistency	0.80			0,83	
Overall solution coverage	0.50			0,58	
N	37			37	

Note: The table includes only the intermediate solution terms. The conditions that are in bold are core conditions which are included in the parsimonious solution terms

The joined effect of micro-level factors being a more optimal financing scheme (FIN) and government guarantees (GUA) and either the absence of PPP-enhancing policies (~POL) (solution 1) or a more appropriate risk allocation (RISK) (solution 2), lead the projects being on-time (see table 26). There is no clear effect of PPP-supporting arrangements and the level of country competitiveness for contributing to the projects being on-time. An optimal financing scheme and government guarantees compensates for the absence of PPP-enhancing policies for projects being on time. Thus, government guarantees play different roles both to reinforce other micro-level factors or to compensate for missing meso-level conditions.

Projects experience delays when they have a less optimal financing scheme (~FIN) and a lack of government guarantees (~GUA), in countries with unfavourable situations (~COMP) and with weak PPP-enhancing policies (~POL) as well as a lack of PPP-supporting arrangements (~SUPP) (see table 26). A less appropriate risk allocation (~RISK) is not included in the sufficient set of conditions causing projects to be delayed.

Table 26: Solution formula of outcome: On time

Solution terms	Outcome: Presence of On Time		Outcome: Absence of On Time (Delay)
	Solution 1	Solution 2	Solution 1
	~POL*FIN*GUA	**FIN*RISK*GUA**	**~COMP***~POL*~SUPP****~FIN*~GUA**
Consistency	0.88	0.89	0.91
Raw coverage	0.30	0.33	0.35
Unique coverage	0.02	0.05	0.35
Projects	A22 - Algarve , Athens International Airport, Larnaka Port, E18 Muurla-Lohja, Lusoponte	Brabo 1, Metrolink LRT, Athens International Airport, Larnaka Port, E18 Muurla-Lohja	Horgos - Pozega, PIRAEUS CONTAINER
Overall solution consistency	0.90		0.91
Overall solution coverage	0.35		0.35
N	37		37

Note: The table includes only the intermediate solution terms. The conditions that are in bold are core conditions which are included in the parsimonious solution terms

6.5 Discussion and conclusions

In this chapter we are particularly interested in studying the extent to which governmental PPP support and its sub-dimensions in a country matter for projects being delivered on time and within budget, and how these conditions interact with the macro-level institutional and financial-economic context (measured by country competitiveness) and micro-level project-related conditions, like the quality of the tendering process, the financing scheme, risk allocation and government guarantees. A comprehensive approach allows us to include many relevant factors to explain the delivery of projects on time and within budget, but also to explain project failure in terms of delay and cost overrun.

The use of fsQCA has yielded seven main findings. First, while the solution paths had high levels of consistency ratio (around 0.90), the coverage ratio, somewhat, was in most paths rather modest around 0.35 to 0.50. Indeed, there is some kind of 'trade-off' between consistency & coverage ratio, but a coverage ratio of more than one third is considered to be acceptable. Moreover, in case of model ambiguity, we have also conducted additional analyses and describe how we minimize as well as explain them to fulfil the transparency in reporting (see for more details in the annexes).

Second, as our main concern is to unravel to what extent governmental PPP support (PPP-GSI) affect project success and failure, this study uses a comprehensive approach and finds that governmental PPP support has contributed, in combination with other conditions, to projects being on cost and on time (see Jamali 2004; Azis 2004; Jacobson & Choi 2008) but also the opposite in case of projects being on cost or with cost overruns (see Chan & Park 2005; Estache & Saussier 2014; Yang et al. 2010). An interesting result is that explaining un-successful project in terms of cost over-run and delay is relatively easier compared to explaining project success.

Third, when we elaborate this more in depth, the presence of high governmental PPP support reflects a *causal asymmetry*, meaning it affects (in different combinations with other factors) the presence of on cost, but at the same time it also plays a role in the absence of on cost. So a well-developed governmental PPP support may under certain conditions enhance PPP project success, but under other conditions it cannot prevent project failure.

Fourth, when existing literature show a single effect of factors influencing projects being success (on cost and on time) and/or a failure (delay and cost overrun), our findings shed more light on the interaction between governmental PPP support as meso-level factor (both in general and for all dimensions of governmental PPP support) with the macro-institutional and economic context (the level of country competitiveness as macro-level factor) and project-specific micro-level factors.

Fifth, as the process tracing shows (see Annex N Figure N.1a), PPP projects being on cost (within budget) are explained by a more optimal financing scheme and are situated in countries in which the macro-institutional and economic context is favourable (high levels of country competitiveness) and with a well-established governmental PPP support, even without government guarantees. Overall, our findings mostly confirm the existing literature[43]. When looking into the dimension of government support (see Annex N Figure N.2a), both two meso factors being high levels of PPP-enhancing policies and a well-established

[43] As it is explained by the strongest path shown (see table 3 - solution 3), we hence elaborate one of the UK road projects being M6 toll more in-depth. The UK is a country with high levels of country competitiveness and a well-developed governmental PPP support. In M6 toll, the well-developed governmental PPP support refers to PPP-enhancing policies and PPP-supporting arrangements, meaning they strengthen each other. In terms of micro-level factors, the project's financing scheme is considered rather optimal in terms of the proportion of equity and debts as well as the sources of debts (around 70%). Moreover, project risks in terms of design, construction and regulatory risks are appropriately allocated. However, whereas in DBFO contracts financial risks usually should be shared with the public partner, this risk is fully borne by the private partners. Thus, this can be understood in two ways: (a) the rather optimal financing scheme may compensate in-appropriate allocation of the financial risk: and (b) the projects is financially viable, so the government does not (need to) provide guarantees.

supporting arrangement and a conduciveness of investment climate (macro factor) reinforce each other to counterbalance the absence of government guarantees.

Sixth, projects being on time are explained by the combination of a more optimal financing scheme and government guarantess, when they interact with other micro-level factors being a high quality of tendering process and more appropriate risk allocation, even in unfavourable macro-institutional and economic conditions (see Annex N Figure N.1b). In line with Iossa et al. (2007) as well as Flyberg et al. (2002), a more appropriate risk allocation also plays a significant role in leading to project being on time. Overall, our findings are supportive to existing literature (see table O.1 Annex O), at least to a certain extent (see table 7, right side). On solution 2 (table 24), a governmental PPP support play a role for the delivery of projects being on time[44]. When digging deeply into the sub-dimensions of governmental PPP support, we can conclude that the role of both PPP-enhancing policies and PPP-supporting arrangements do not affect project being on time (see Annex N Figure N.2b)

Seventh, having a less optimal financing scheme is an important condition for explaining the projects experiencing cost overruns.[45] By exception of risk allocation, all found conditions mostly confirm the literature (see Annex O table O.2). The strongest path refers to solution 1 (table 23-right side) which covers three Greece road projects and four Spain road as well as non-road projects[46]. In this case, low levels of governmental PPP support (also low levels of competitiveness and absence of guarantees) is found a significant role in leading to cost overruns, when further analysis shows that it is only weakly developed PPP-supporting arrangements as a significant factor for leading cost overruns.

Finally, the projects experiencing delay are mostly explained by a non-conducive macro-institutional and economic and a lack of government guarantees.[47] The strongest path additionally indicates no government guarantees as a factor and this path covers Horgos Pozega and Piraeus Container. The second path shows low levels of PPP-enhancing policies as well as PPP-supporting arrangements reinforcing the effects of the other factors in causing delayed projects (see table 6-right side).

As no single factor can lead to project success, it is the interplay between macro-, meso- and micro- level factors that counts. This insight is important for PPP practitioners and policy makers. One might note that the projects being on time and within budget most often depends on the optimisation of the projects' capital structure combined with a conducive macro-institutional and economic context (high levels of country competitiveness) and well-developed governmental PPP support and/or a more appropriate risk allocation. This implies that governments should concern themselves with these aspects when creating good pre-conditions for the delivery of PPP. In addition, the projects which have been granted government

[44] Under this path, we elaborate the PPP project Brabo 1 (Belgium) more in-depth. This project is funded by a more optimal financing scheme which is complemented by several government guarantees including a refinancing guarantee from the Flemish Government, a continued payment guarantees and partial credit guarantees. Also, the four main risks (design, construction, financial and regulatory) are appropriately allocated. The further analysis using each dimension of governmental PPP support shows no effect of macro- and meso-level factors on the project being on time. Hence, government guarantees may compensate the role of governmental support (also macro-institutional and economic) for leading the project to be delivered on time.

[45] Using the maxi-maxi principles of process tracing, we compare E75 Horgos (0.8, 1.0) and Central Greece (0.6, 1.0) and find a single parsimonious condition being a less optimal financing scheme (no further discussed in this paper)

[46] Although having high levels of governmental PPP support as well as government guarantees, Radial 2 as Spanish road project has a less optimal financing scheme representing a high level of debt financing (85% debts provided by bank syndicates), leading to cost overrun. This project experienced several problems like additional works and deviation of the price of land that have caused cost overruns. The concessionaire has been the financial beneficiary of participative loans provided by the financial institutions to meet the payment for land acquisition as well as short term financial support. However, this support was not eventually fully implemented. As a result, the concessionaires experienced the insolvency for payment of price of land acquisition and thus lead to contract renegotiation (Villalba & Liyanage 2014). Further analysis shows that weakly developed PPP-supporting arrangements also become a significant factor for leading cost overruns. Indeed, there was no dedicated PPP unit in the Spanish public sector at that time (Villalba & Liyanage 2014).

[47] Using the maxi-maxi principles of process tracing, we compare E75 Horgos (0.8, 1.0) and Bre Be (0.6, 1.0) and find a parsimonious solution containing low levels of country competitiveness and no government guarantees provided (not further discussed in this paper)

guarantees are not necessarily being delivered on-time and within budget. Thus, the governments should consider the interaction with other factors if they intend to grant government guarantees to PPP projects.

When explaining projects success (failure) in terms of on/over cost and on/over time, many factors should be taken into account carefully. However, this study mainly focuses on the role of PPP governmental support on project success while accounting for micro-level project-related factors (exogenous factors), so future research might deal with the role of internal project-related factors (endogenous factors) like the strength of the private consortium, trust and commitment between partners, effective management control, coordination and project management as well as suitable skills and experience, and so on. Moreover, in this chapter we basically focus on explaining more tangible goals of PPPs in terms of being delivered on time and within budget. Future research should focus on other outcomes like the quality of service, traffic flows generated revenue streams in order to study a broader spectrum of project success (failure).

Chapter 7

Conclusion

7.1. Summary of findings

This dissertation aims at providing a scientific contribution for academics and practitioners' perspectives regarding public-private partnerships. It comprises three central research questions or themes, which are answered in five chapters.

The first research question attempted to investigate the relevant aspects of national-institutional context, building upon the institutional theory-based literature and practitioner-oriented literature, which are considered conducive for the development of an extensive governmental support for PPPs. The related research questions are: *How do central governments support the development of PPPs by providing PPP-enhancing institutions? How do different European countries compare in terms of their governmental support towards PPPs and with which other European countries do they cluster with regard to the development of policies and political support of PPP, legal and regulatory frameworks and supporting arrangements for PPPs?* (RQ1.1 and RQ1.2)

Chapter 2 answers RQ1.1, by conceptualising, measuring and comparing the extent to which governments develop their support for PPPs (Verhoest et al. 2015). By reviewing PPP literature on how governments develop their support for PPPs, three relevant dimensions for such support are found to be crucial:

(1) PPP-enhancing policies and political commitment (see Matos-Castaño et al., 2014; Flinders, 2005; Johnston, 2010; Jooste et al., 2011; Dehli et al., 2010; IMF, 2004; UNESCAP 2005; OECD, 2006; Deloitte, 2007; World Bank and PPIAF, 2012);
(2) a PPP-enabling legal and regulatory framework (see Mörth, 2007; Bovis, 2013; Petersen 2011; World Bank and PPIAF, 2012; see also FIMA s.d.; UNCITRAL, 2001; EIU, 2011; EBRD 2012; EIB 2011); and
(3) PPP-supporting arrangements (Jooste et al., 2011; Mahalingam et al., 2011; Jooste & Scott, 2012; Ferrugia, Reynolds & Orr, 2008; EIB, 2004; OECD, 2010; World Bank & PPIAF, 2006).

Based on these elements, Chapter 2 then builds a comprehensive 'Governmental PPP Support Index' (PPP-GSI) for 20 European countries reflecting (i) the extent to which policies and the political environment are conducive or prohibitive to PPPs, (ii) whether specific PPP laws and/or types of regulations have been put in place, and (iii) the existence of specialised PPP-supporting arrangements are available such as dedicated PPP units, standard frameworks and green-lighting procedures. The governmental PPP support (PPP-GSI) differs from other existing indices, like 'PPP-readiness' (UNESCAP, 2005, Economist Intelligence Unit EIU, 2011), 'PPP maturity level' (Deloitte, 2007), and 'quality of PPP legislation' (EIB, 2011; EBRD, 2012). In fact, when compared to the other existing indexes, the developed PPP-GSI is the most comprehensive index of governmental PPP support in literature.

The calculation of PPP-GSI across twenty European countries show the score of the PPP-GSI differs across 20 European countries. The highest value of PPP-GSI is the UK (score: 3.0) followed by The Netherlands, Germany, Belgium-Flanders, Greece, and Portugal that have PPP-GSI scores between 2.5 and 2.9. Three countries have scores between 2.0 and 2.4: France, Italy and the Czech Republic, while Austria, Denmark, Estonia, Serbia, Slovenia, Cyprus, Finland, Slovakia, Hungary and Sweden score below 2.0 while Estonia has the lowest value (1.2). These four groups of countries with different levels of governmental supports do not seem to match with the usually distinguished country clusters based on geography or politico-administrative culture (e.g. Latin, continental and CEE countries).

When linking the extent of governmental PPP support with the extent of PPP take-up in a country, Chapter 2 shows that that link is certainly not straightforward. Low levels of governmental PPP support seem to relate to relatively weak PPP activities. However, not all countries with high levels of governmental support have high PPP activities from 2010 to 2012. In countries where PPPs are strongly supported by policies and governmental institutions, the actual take-up of *PPPs* might still be quite low like in the Netherlands.

Chapter 3 compares governmental PPP support by the different involved European governments in order to provide the evaluation of convergence and divergence in governmental PPP support across European countries using the analytical method of cluster analysis (CA).

1) Twenty European countries are grouped into four clusters in terms of PPP-GSI. Cluster 1 includes the UK, the Netherlands, Germany, and Belgium-Flanders, which are the countries with well-developed policies, political commitment, and supporting arrangements. Countries in cluster 2 encompassing Greece, Portugal, and France are strong legal and regulatory supporters of PPPs as their government support emphasises the articulation of an appropriate legal and regulatory framework. Countries in cluster 3 have developed most elements of government support of PPPs, but have done this at a more limited or moderate scale. Hence, they are considered moderate supporters of PPPs. Lastly, cluster 4 consists of eight countries (Austria, Estonia, Sweden, Finland, Serbia, Slovenia, Cyprus, and Hungary), which are the least articulated providers of governmental support for PPP.
2) Comparing the four clusters along the three different dimensions of governmental PPP support shows ample variation. Only the United Kingdom, the Netherlands, and Germany are always positioned in the same cluster with regard to all three dimensions as they deliver a strong policy and political commitment, establish comprehensive PPP supporting arrangements, and stipulate legal and regulatory support with a clear focus on national procurement law. The rest of countries shift in terms of clusters, relating respectively to policies and political commitment, regulations and supporting arrangements for PPP. This chapter shows that the convergence in global PPP policy rhetoric is accompanied with a widespread and enduring divergence in the actual policies and political commitment, legal and regulatory frameworks as well as supporting arrangements that are enacted by governments to support (or hinder) the uptake of PPPs across countries.

The second research question asks *to what extent can the observed variations in PPP governmental support across European countries be explained by macro-institutional and macro-economic features of these countries, and by combinations of these features*.

Chapter 4 attempts to explain the variations of government supports across 20 European countries using macro-institutional factors like polity (Lijphart 1999; Hague and Harrop 2007), culture and administrative reform tradition (Hause et al 2004), and macro-economic and macro-financial characteristics (e.g. Nolke and Vliegenthart 2009; McQuaid and Scherrer 2010). Five explanatory variables are included in the analysis being the state structure, the level of NPM-inspired administrative reforms, the level of uncertainty avoidance, the level of GDP per capita, and the level of government debt.

1) The variation in governmental PPP support is explained quite robustly by countries' characteristics in terms of macro-institutional, macro-economic and macro-financial conditions. By exception of the United Kingdom, the different combinations of the level of GDP per-capita, the level of government debt, the level of uncertainty avoidance and the administrative reform trajectory and to a lesser extent also the state structure show to be associated with the presence or absence of a high governmental PPP support, in the way we expected.

2) As to the explanation of the three dimensions of governmental PPP support, the results show that:
   a) The economic prosperity (measured as the level of GDP per capita) and the administrative reform trajectory (in different combinations) are substantial conditions for the presence or absence of a more appropriate policy and political commitment.
   b) The state structure, the level of uncertainty avoidance index and the level of government debt (in different combinations) turn out to be significant factors for the presence or absence of a PPP enabling legal and regulatory frameworks.
   c) The different combinations of the level of uncertainty avoidance, the level of GDP per-capita, and the level of government debt are found to be an important explanatory condition for the presence or absence of PPP supporting arrangements.

3) By mapping the typologies of countries based on similarities and differences in terms of macro-institutional variables, the level of governmental PPP support can be classified into six groups.

   a) Group 1 includes Belgium (Flanders) and France, which are countries with well-developed regulations and supporting arrangements, and which have high levels of government debt, a high level of uncertainty avoidance and a more centralized state structure and high level of GDP per capita.
   b) Group 2 represents countries with more extensive PPP-enhancing regulations, but with low level of PPP-policies and political commitment, being Greece and Portugal that have high levels of government debt, high levels of uncertainty avoidance and a more centralized state structure as well as low levels of GDP per capita and a less radical administrative reform trajectory.
   c) Group 3 refers to a group of country with a low level of all dimensions of government support, and represents two countries, Switzerland and Slovakia. These two countries have a low level of government debt and a low uncertainty avoidance index.
   d) Group 4 delineates countries with a weakly developed PPP-enhancing legal and regulatory framework, being the 'Scandinavian countries' (Denmark, Sweden and Finland) and Netherlands which all have a low level of uncertainty avoidance and low levels of government debt.
   e) Similar with group 4 in terms of countries with low level of legal and regulatory framework, Group 5 indicates countries with a less radical administrative reform trajectory and a less centralized state structure. Two 'Germanic countries' being Austria and Germany as well as Italy belong to this group.
   f) Group 6 denotes a set of 'Ex-Soviet countries' encompassing the Czech Republic, Serbia and Slovenia and Hungary, which represent a lack of conditions of policy and political commitment. These countries all have low levels of GDP per capita and a less radical administrative reform trajectory.

   The rest of countries like The United Kingdom, Estonia and Cyprus are countries with specific typologies that can not be classified into the groups listed above.

4) By linking the fs-QCA results of the governmental PPP support in general and its dimensions, we show that all configurations explaining both presence and absence of a well-established governmental PPP support fully corresponds with both presence and absence of a more well-established supporting arrangements.

The last research question aimed at investigating the effect of variations of governmental PPP support on project outcomes, which refer to contract stability and project success in terms of on time and within budget delivery.

Chapter 5 sets out to understand the role of governmental PPP support on the contract stability or the absence of contract renegotiation. Based on previous studies that investigate the determinants of contract renegotiation (see Guasch et al. 2003 Guasch 2004; Guasch et al. 2007; Guasch et al. 2008; Guasch & Straub 2009; Estache et al. 2009; Montecinos & Saavedra 2011; Cruz & Marquez 2013b; and Sarmento 2014; Domingues & Sarmento 2016), we analysed five conditions which can be classified into macro-level, meso-level, and micro-level factors and which are essential to explain the presence or absence of contract stability of transport infrastructure projects in European countries.

1) The common patterns of explaining contract stability are hard to find. Nevertheless, we do get a better view on how macro-, meso- and micro-level factors interact.
   a) Contract stability was found in projects in which a favorable macro-level business environment (high level of country competitiveness) joined up with a secure remuneration scheme and a young project age, combined with either a well-developed governmental PPP support or an appropriate risk allocation.
   b) Contract renegotiation found in PPP toll road projects were funded by a less secure remuneration scheme as a necessary condition and this is combined with an unfavourable or worsening institutional and financial-economic context (i.e level of country competitiveness).
   c) The contribution of the other micro-level conditions, like appropriateness of risk allocation and contract duration, to contract stability and contract renegotiation is less straightforward to interpret.
   d) The role of governmental PPP support does not straightforwardly affect the contract stability, but it helps to attenuate the negative effects of the absence of other conditions. When combined with a favourable macro-economic context, it may compensate for the negative influence of a less appropriate risk allocation and a longer contract duration. Hence, the governmental PPP support helps to avoid contract renegotiation in case of less optimal risk allocation in longer contracts

2) The most relevant dimension of governmental PPP support is the existence of well-developed supporting arrangements. In favourable institutional and financial-economic contexts and together with clear PPP-advocating policies and political commitment, this leads PPP contracts to be stable. However, more importantly, the absence of such supporting arrangements is common to all renegotiated projects. Indeed, PPP-units which act as regulatory bodies, the use of standardized ex-ante evaluation instruments, and the existence of standardized contracts are indeed said to help select PPP projects with good viability, to avoid political biases, to draft resilient contracts, to structure PPPs more optimally, and to manage the contract well (Guasch et al. 2008; Ho & Tsui 2009; Cruz et al. 2011; Sarmento 2014; Domingues and Sarmento 2016; Cruz & Marques 2013a; Montecinos & Saavedra 2011; Cruz & Marques 2013a: 2013b).

3) The absence of three dimensions of PPP governmental support explains the absence of contract stability or occurrence contract renegotiation more straightforwardly than the presence of PPP governmental support dimensions explaining the presence of contract stability. Results underline the importance of PPP supporting arrangements to secure contract stability as less well-established PPP supporting arrangements bring a higher chance to contract renegotiation.

Chapter 6 unravels the effects of government support on projects success in terms of on time and within budget delivery of infrastructure.

1) Using a comprehensive approach, we synthesise all factors that are said to influence the project in a successful way (on time and within budget) (i.e. Hammami et al. 2006; Galilea & Medda 2010; Zagosdzon 2013; Mota & Moreira 2015; Mahalingam & Kapur 2009; Matos Castano 2011; Percoco 2014; Osei-Kyei & Chan 2015; Iossa et al. 2007; Delhi & Mahalingam 2013), but also the factors that

lead to project failure in terms of delay and cost overrun (i.e. Chan et al. 2010; Flyberg et al. 2003; Chan & Park 2005; Nida, A et al. 2008; Foucacre et al. 1990; Flyberg et al. 2004; Nijkamp & Ubbels 1999; Morris 1990; Chantareli et al. 2012; Odeck 2004). In short, project success or failure are mostly linked to macro-level factors as the macro-institutional and macro-economic context; meso-level factor like governmental PPP support; and micro-level factors including the financing scheme, the provision of guarantees, the quality of tendering process, and (non-)appropriate risk allocations.

2) The presence of high governmental PPP support reflects causal asymmetric solutions that explains the outcomes. This means that it affects (in different combination with other conditions) the presence of on cost and on time delivery. However, at the same time, it also affects the absence of on cost and on time delivery of PPPs. When the existing literature shows a single effect of factors influencing projects being a success (on cost and on time) and/or a failure (delayed and cost overrun), this finding clearly indicates that governmental PPP support as a meso-level factor and its dimensions interact with the macro-institutional and economic context as macro-level factors and project-specific micro-level factors in very specific ways in order for projects to be a success.

3) The PPP projects that are delivered on-cost (within budget) are explained by a more optimal financing scheme and by a country context that is favourable in terms of having high levels of country competitiveness and a well-established governmental PPP support. Moreover, the projects that are delivered on-time are mostly affected by the combination of macro-level factors (i.e. high levels of country competitiveness) and micro-level factors such as a more optimal financing scheme and a more appropriate risk allocation. The further analysis shows no effect of macro- and meso-level factors on the projects delivered 'on time', but government guarantees may compensate the role of governmental PPP supports (also macro-institutional and -economic conditions).

4) Having a less optimal financing scheme is a single condition that can explain the cost overrun in projects. Further analysis shows that weak PPP-supporting arrangements also become a significant factor to lead to cost overruns. The delayed projects are mostly explained by a non-conducive macro-institutional and economic context and the absence of government guarantees. In addition, weakly developed PPP-enhancing policies as well as weak PPP-supporting arrangement reinforce the other factors to lead to delayed projects.

7.2. Scientific contributions of this dissertation

Each chapter has its own contribution to specific academic perspectives. The scientific contributions of this dissertation can be listed as follows.

1) This dissertation entails a rather comprehensive comparative study regarding governmental PPP support by adopting four different points of analysis (Pollitt & Bouckaert 2004; Verhoest et al 2010; Verhoest et al 2013, 2015; Carbonara et al, 2015; Liyanage & Villalba, 2015). While theme 1 compares and explains (the variation of) governmental PPP support by country characteristics, theme 2 investigates the effect of the variation of government PPP support on both the contract stability and project success of PPP projects.

2) This dissertation builds two typologies of country in terms of government support: (1) a country typology in terms of the three dimensions of governmental PPP support, being policies and political commitment, regulations and supporting arrangements (see chapter 3) and (2) a country typology of government PPP support based on underlying configurations representing country characteristics (NPM reforms, state structure, uncertainty avoidance, GDP growth, and government debt) (see chapter 4). The first typology delineates the clustering of country variations in terms of each dimension of

PPP-GSI. The results indicate four clusters of countries in terms of both governmental PPP support and its each dimension. The second typology extends the first typology by integrating it with macro institutional and macro-economic variables. Thus, this dissertation formulates two different typologies, which are descriptive and explanatory typologies. The first typology refers to descriptive typologies in which the dimensions and cell types serve to identify and describe the phenomena under the analysis (Collies et al 2012). In contrast, the second typology has an explanatory nature (Elman 2005; Bennett and Elman 2006) in which the cell types are the outcomes to be explained and the rows and columns are the explanatory variables.

3) Previous studies often focus on finding critical success factors for PPP project success (for example: Hammami et al 2006; Zagozdzon 2013; Mota & Moreira 2015; Galilea & Medda 2010; Percoco, 2014; Kyei & Chan 2015; Chan et al 2010; and Chan et al 2004). Other studies explore factors for failure in terms of delay and cost overrun (i.e Flyberg et al 2003, 2004; Chan & Park 2005; Nida et. al. 2008; Foucacre et al. 1990; Nijkamp & Ubbels 1999; Morris 1990; Chantareli et al. 2012; Odeck 2004; and Mansfield 1994). However, such empirical studies often lack evidence for the causal relation of these individual factors, as well as the interplay of these factors with the outcome of project success or failure. This dissertation uses a comprehensive approach to select relevant explanatory variables or conditions by integrating factors that correspond with not only projects success but also with project failure. We point out that the selection of conditions should be more comprehensive than only considering factors for success or factors for failure as there might be causal asymmetry (i.e positive and negative outcomes explained by other sects of factors). While previous studies showed an independent effect of factors to influence project success and failure, this dissertation clearly shows that it is the specific interplay of factors being macro-, meso- and micro-level factors which explain the project successful and failure.

4) This dissertation exhibits the effects of the variation of government PPP support across countries on project outcomes (project management and contract management success) First of all, a clear pattern is found as to the correlation between the contract stability and projects success. A stable contract most often relates with the delivery of projects within budget as the UK motorways (i.e. M80 Stepps to Haggs and A19 Dishfort). Moreover, several projects which maintained contract stability did also achieve project success in terms of on cost delivery (Via Invest Z and M25 Motorway). Otherwise, projects experiencing contract renegotiation also refer to failed projects in terms of cost overrun (Central Greece, Moreas and Elefsina Khoriontos-Greece and Radial2 and Eje Aeroporto-Spain). The projects **M80 Haggs and E18 Muurla-Lohja can be referred to as the best practices of both the contract stability and the delivery on time and within budget**. More specifically, M80 Haggs is a successful project with a more optimal financing scheme in a context with a high level of governmental PPP support and high levels of country competitiveness. E18 Muurla-Lohja represents a successful project which has good micro-level factors, being a more optimal financing scheme, a more appropriate risk allocation, government guarantees provided, although in a context with a low level of governmental PPP support. This means that governmental PPP support in itself is not the one and only factor which can deliver contract stability as well as project success.

5) In this dissertation the process tracing methodology has been employed to show the causal mechanism of the configurations that explain the outcomes. As Schneider & Rohlfing 2013 argued, the process tracing is an invaluable complement for QCA to discern the causal mechanism behind a set-relational pattern and to further improve the theory and QCA model. The projects delivered on cost can mostly be explained by a more optimal financing scheme andby being situated in a country with high levels of competitiveness and high levels of governmental PPP support. Moreover, the projects delivered on

time can mostly be explained by the combination of a more optimal financing scheme and government guarantess provided (Chapter 6).

7.3. Policy implications

Since the government budget for infrastructure financing became more limited and also the rise of global financial crisis, PPPs have gained momentum as being the most feasible alternative for provision of public infrastructure. Thus, the government and private sectors as practitioners have attempted to enhance the development of PPPs. This dissertation has shown the huge variation in governmental PPP support among European countries. While the government or public agencies could benefit from this variation (together with its explanation) as a benchmark for evaluating their own level of governmental support, the private sectors might utilise this information in different countries based on comparative country profile and indices that map the government support. In this section we focus however explicitly on the policy implications since this study focuses on the role of government for enhancing PPPs.

When comparing and explaining the governmental PPP support, the degree of support varies strongly across dimensions and countries. The successful implementation of PPPs depends upon three dimensions: policies and political support, legal framework, and PPP-supporting arrangements. A strong and long-term political commitment of the government in terms of cross-political party support is an essential factor for implementation of PPPs like in the United Kingdom and the Netherlands. A well-developed PPP law like in France, Portugal, and Greece does not necessarily guarantee the enhancement of PPPs. Recently, Casady (2020) reinforced our findings that the presence of political and social will as well as regulatory regime are necessary conditions, whereas the presence of institutional support matters as a sufficient condition for explaining PPP market maturity. In addition, a strong political support and a stable mandate are definitely necessary to establish PPP-supporting arrangements. However, strengthening their effectiveness of PPP units is much more crucial than focusing solely on such units' formal role and the enhancement of knowledge of PPPs.

The level of country competitiveness is a sufficient condition (in different combination with other condition) to explain all outcomes under review with respect to contract stability, and project success in terms of on time and within budget. In detail, parallel with remuneration scheme, high (low) levels of country competitiveness is a sufficient condition to explain the presence (absence) of contract stability. The projects delivered on time and within budget are also affected by good macro-institutional and macro-economic conditions. Consequently, governments should aim to create and maintain the high level of country competitiveness including political stability, the rule of law, government effectiveness, minimising the level of corruption, and macro-economic stability.

A high quality of tendering process has no substantial effect to explain the delivery of project success. However, a low quality of tender process found (in different combinations with other conditions) has a significant effect in terms of leading the projects to be delayed and to experience cost overruns. Therefore, the government may need to redesign and reformulate the tender process not only in order to adopt the EU Directives 2004/18/EC and amendment Directives 2014/24/EU but also in order to strengthen the institutional framework of PPP as well as to guarantee a proper evaluation and assessment of the individual projects by an independent government organization (like a PPP-unit).

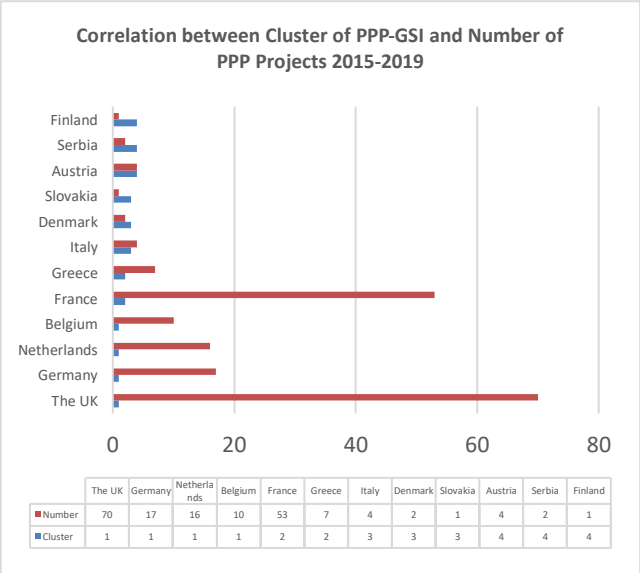
A more robust remuneration scheme is essential to deliver the contract stability and reduce the incidence of renegotiation. Therefore, the government should design a contract as comprehensive as possible by considering all aspects, not only enhancing the public service on public infrastructure but also carefully defining the ability of the private sectors to safeguard their operation in terms of payment mechanism or

remuneration scheme. However, choosing a user-paid toll-based remuneration scheme in a country with a deteriorating institutional and financial-economic context and a lack of PPP supporting arrangements increases the likeliness for a contract renegotiation to a very large extent.

The effect of government guarantees cannot be directly linked to project success. Although being granted full guarantees (both related to implementation and operation), projects like Central Greece, Elefsina Korinthos, and Moreas Motorway, nevertheless experienced delays and cost overruns. This means there are other factors which might affect the delay and cost overrun. Accordingly, the governments should consider the interaction with other factors if they intend to grant government guarantees to PPP projects in terms of deciding what type of guarantee (financial and/or non-financial) and in which stages of project implementation (construction and/or operation).

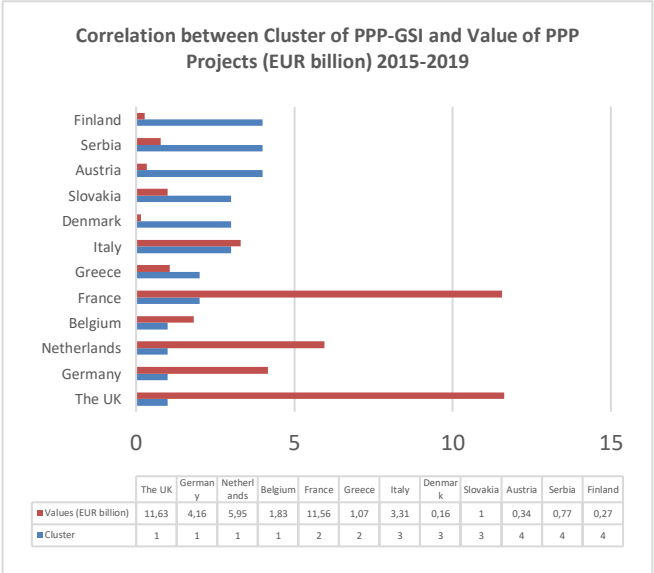
7.4. Reflections, limitations and research agenda

This dissertation attempted to study the governmental PPP support in EU countries, to explain its variance across the countries, and its effect on the projects' outcome in terms of contract stability and on time and on cost delivery. Some reflections can be derived from the studies including in this dissertation. First of all, with researchers and international organizations labelling it as national PPP context or PPP-enabling fields (see for example Delhi et al., 2010; Meunier and Guinet, 2010; Jooste et al., 2011), 'PPP readiness' (UNESCAP, 2005; EIU, 2011), 'PPP maturity level' (Deloitte, 2007), and 'quality of PPP legislation' (EIB, 2011; EBRD, 2012), our index of governmental support for PPPs (the PPP-GSI) captures the main formal mechanisms which are directly under control of government. The governmental support for PPPs shows to be a highly divergent policy phenomenon according to the research in this dissertation. Grouping countries based of cluster analysis (CA) allowed us to classify countries into four clusters and each four-clusters for policy and political commitment, legal and regulatory framework and PPP supporting arrangements. These clusters are considered more appropriate measure than the static index (PPP-GSI), because these may be still relevant for longer period of measurement. Let us consider the relevance for the period 2015 to 2019. Using data from the PPP Market Update (EIB, 2020), the correlation between the PPP-GSI clusters of countries on the one hand and the number as well as value of PPP projects for the period 2015-2019 across European countries on the other hand is depicted as follows.



	The UK	Germany	Netherlands	Belgium	France	Greece	Italy	Denmark	Slovakia	Austria	Serbia	Finland
Number	70	17	16	10	53	7	4	2	1	4	2	1
Cluster	1	1	1	1	2	2	3	3	3	4	4	4

Figure 8a. Correlation between Cluster of PPP-GSI and number of PPP projects across EU Countries 2015-2019



	The UK	Germany	Netherlands	Belgium	France	Greece	Italy	Denmark	Slovakia	Austria	Serbia	Finland
Values (EUR billion)	11,63	4,16	5,95	1,83	11,56	1,07	3,31	0,16	1	0,34	0,77	0,27
Cluster	1	1	1	1	2	2	3	3	3	4	4	4

Figure 8a. Correlation between Cluster of PPP-GSI and number of PPP projects across EU Countries 2015-2019

All countries in cluster 1 (i.e. The United Kingdom, Germany, Netherlands and Belgium) take up at least 10 PPP pojects and a value of PPP projects of minimally EUR 2 billion during 2015-2019. By exception of France, countries in cluster 2, 3 and 4 record less than 10 PPP projects and a maximum amount of merely EUR 1,07 billion. This shows that the clustering of countries based on the level of PPP governmental support relates to the amount of PPP take up in the period of 2015-2019, showing the relevance of our notion of PPP governmental support over time.

Second, the studies in this dissertation show that three different macro-institutional variables being the state structure, NPM driven reforms and the Uncertainty Avoidance Index as well as two macro economic-financial (GDP per-capita and government debts) can explain partiallly the level adoption of PPPs.

1. The presence of high-levels of macro economic-financial variables are more likely associated with high level adoption of PPPs than the presence of high-levels of macro institutional variables.
2. The absence of high-levels of macro economic-financial variables are more likely associated with low-level adoption of PPPs than the absence of high-levels of macro institutional variables.

This implies that the economic-financial variables are a main drivers for adopting PPPs (Boardman and Vining, 2010 see also Pollit and Bouckaert, 2017; Wollman, 2003; Chirstensen and Laegreid, 2001; Checerita, 2009; McQuaid and Scherrer, 2010; Flinders, 2005).

Third, there are three dimensions of learning with QCA (see Verhoest et al. 2010; Verhoest et al. 2013, 2015; Carbonara et al, 2015; Liyanage & Villalba, 2015). Using QCA allows us to examine the different dimensions of comparison, more specifically to see the interaction between different levels of analysis referring to macro, meso and micro levels variables. The first dimension is the comparison at the country level in the adoption of PPP governmental support (see Sach, Tiong and Wang, 2007; Van den Hurk et al., 2015; Jooste, Levit and Scott, 2011). In this dissertation we mapped the PPP-GSI (meso level) was mapped, clustered and compared based on country characteristics (macro level). The second dimension is the comparison across project sectors. Studies focus on the PPP in specific sectors like the health sector (Greenaway et al., 2004) educational infrastructure (Ahadzi and Bowles, 2014) and sports infrastructure (van den Hurk and Verhoest, 2015). In this dissertation Chapter 6 examines project success in different modes of transportation like roads, bridges, airports, seaports and urban transportations, using macro level, meso level and micro level (i.e the quality of tendering process, financing scheme, risk allocation, government guarantee) factors. The results indicate that all modes of transportations share in an equal way the combination of macro, meso and micro conditions for explaining successful (failed) projects. Lastly, the dissertation provides learning and new insights through comparison across projects of different types of project outcomes in terms of both contract stability as well as project delivery on cost and on time (chapter 5 and 6). Until now, literature in which different project outcomes are studies, was lacking. Moreover, most studies focus more on the general factors influencing the project success, while in this dissertation the combined effect of specific factors at different levels are studied.

As to contract stability, we examine to what extent the interaction between macro level (country competitiveness), meso level (PPP governmental support) and micro level variables (risk allocation, remuneration scheme, contract duration, project age) matters for explaining contract stability.

1. The combined presence of specific macro, meso and micro level conditions is the most likely associated with contract stability or non-renegotation;
2. The absence of specific combinations of macro, meso and micro level conditions is associated with unstable contracts or contract renegotiations.

This findings are in line with other research (Markovsek et al., 2014; see also Domingues and Sarmento, 2016; Sarmento, 2014; Iossa, Spagnolo and Vellexz, 2007; Cruz and Marquez, 2013a; Guasch and Straub, 2009; Estachhe, Guasch and Trujilo, 2003).

The macro level (country competitiveness), the meso level (PPP governmental support) and micro level variables (the quality of tendering process, financing scheme, risk allocation, and government guarantees) are also tested to unravel the projects success in terms of on cost and on time outcome.

3. The presence of specific combinations of macro, meso and micro level conditions are the most likely associated with projects being on cost; and the absence of such combinations is associated with cost overrun
4. For projects being on time, micro level conditions are more important than macro- and meso level conditions, but the absence of the combination of macro, meso and micro conditions leads to projects being over time.

This implies that the interaction between macro and micro and to a lesser extent meso level condition can explain projects success in terms of on cost and on time, as well as project failure in terms of cost overrun and delays (see for example Osei-Kyei and Chan, 2015; Mota and Moreira, 2015; Chan et al., 2010; Yang et al. 2010; Chan and Park, 2005)).

Lastly, when digging deeply into which sub-dimension of governmental PPP support help to explain projects outcome (contract stability and projects success), our findings show that:

1. The presence of high levels of PPP policy and political commitment is the most likely associated with contract stability as well as with projects being on cost.
2. The presence of advanced PPP regulatory frameworks proves to be somewhat less relevant for contract stability as well as delivering projects being on cost, and sometimes even acts against reaching these outcomes.
3. The presence of high levels of PPP supporting arrangements is a vital condition for avoiding contract renegotiation and for delivering projects being on cost. Consistently, the absence of high levels of supporting arrangements (in different combination) explains the projects being over cost and delayed.

These results seem to be in line with a recent study of Casady (2020), which found that three institutional conditions being legitimacy (regulatory regime); trust (political and social will) and capacity (institutional support) are necessary and/or sufficient conditions for explaining PPP market maturity.

However, some limitations of the studies in this dissertation should be explicitly mentioned. This dissertation should be understood as a collection of articles with not only commonalities but also clear differences. Each article aims at contributing to specific research fields in comparative PPP studies.

The concept of government support for PPPs deliberately comprises solely elements, which can be influenced by the government more or less directly. It does not account for other elements like macroeconomic variables and the investment climate. Moreover, this concept also cannot consider political actors which may adopt reforms to legitimise themselves, but 'decouple' these reforms from their actual decision-making behaviour.

As the government support documented in this dissertation reflects the situation in 2013, most of our (sub) indicators are of a static nature (see chapter 2). Ideally, government support should be measured dynamically in order to observe the change of policies and political commitment, regulations, and PPP supporting arrangements over time. Hence, future research might substantiate the PPP-GSI as a 'dynamic

measure' of governmental PPP support by evaluating the changes in the indices every 5 or 10 years in order to show the evolution over time.

Due to the limited number of projects which refer to specific country samples, it was rather hard to come to conclusive insights regarding the effects of the level of governmental PPP support on contract stability and project success. Some countries (i.e Switzerland, Denmark, Estonia, Slovenia, Slovakia, and Hungary) are not represented by one or more cases. Future studies should include more projects for each country studied.

The PPP GSI measures the policies, regulations and supporting arrangements at the moment of contract closure. The PPP GSI as an indicator reflects the extent of the role of government to enhance PPPs, but the processes underlying ongoing projects from contract closure to contract management (i.e the substance of the contract, contract monitoring, coordination among PPP units and other government contract agencies (GCA) are not well covered by this index. Hence, future studies should expand the PPP GSI in content and time scope to be more encompassing.

The governmental PPP support is said to be an essential factor in a complex interplay of different configuration for explaining outcomes. In addition, no elements of governmental support seem to be equally important. For example, (1) PPP-specific regulations have a significant effect on assuring a high quality tender process; (2) both the PPP-supporting arrangements and the PPP-enhancing policies (in different combinations) lead to the presence of contract stability as well as the project being on cost. Future studies might focus on the specific elements of governmental PPP support, like for example the extension of PPP supporting arrangements to the capacity present in line departments.

A major cause of several countries with a highly developed governmental PPP support showing a rather weak PPP activity in that period is most probably the financial-economic crisis from 2008 and its consequences for the macro-economic situation as well as for the investment climate in particular countries. However the actual effect of these events is hard to study as cross-country data for European countries are very limited in their scope and content with EPEC data only providing relatively complete data from 2010 onwards. Using a more comprehensive data set which stretches farther back in time might result in finding much clearer effects of the levels of government support on PPP activity across European countries.

A future agenda may also deal with an extended notion of project outcomes such as intermediate outcomes in terms of business dynamics (traffic and revenue), quality, efficiency (see Shenhar et al. 1997; Atkinson 1999; Lim & Mohammed 1999), as well as the ultimate outcomes or benefits for users/customers, organizations, national infrastructures (see Sadeh et al. 2000).

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Annex A

Table A.1: Country samples

No	Regions	No	Countries	Abbreviation
1	Western European Countries	1	Austria	AT
		2	Belgium-Flanders	BE
		3	France	FR
		4	The Netherlands	NL
		5	Switzerland	CH
		6	Germany	DE
2	Southern European Countries	1	Cyprus	CY
		2	Greece	GR
		3	Italy	IT
		4	Portugal	PT
		5	Serbia	RS
		6	Slovenia	SI
3	Northern European Countries	1	Denmark	DK
		2	Estonia	EE
		3	Finland	FL
		4	Sweden	SE
		5	United Kingdom	UK
4	Eastern European Countries	1	Czech Republik	CZ
		2	Slovania	SL
		3	Hungary	HU

Annex B

Table B.1: PPP projects samples

No	PPP Projects	Type Infrastructure	Countries	Chapter*
1	Attiki Odos (Athens Ring Roads)	Toll Roads	Greece	5/6
2	Rion Antirion Bridge	Bridge	Greece	5
3	Piraeus Container Terminal	Terminal	Greece	6
4	Ionia Odos Motorway	Toll Roads	Greece	5
5	Central Greece Motorway	Toll Roads	Greece	5/6
6	BNRR (M6) Tollway	Toll Roads	UK	5/6
7	M80 Stepps to Haggs	Toll Roads	UK	5/6
8	A19 Dishfort to Tyne Tunnel	Toll Roads	UK	5/6
9	Metrolink LRT Manchester	Public Transport	UK	6
10	A22-Algarve	Toll Roads	Portugal	5/6
11	Radial 2 Toll Motorway	Toll Roads	Spain	5/6
12	Eje Aeroporto (M-12) Airport Axis Toll	Toll Roads	Spain	5/6
13	M 45	Toll Roads	Spain	5/6
14	Port of Sines Terminal XXI	Terminal	Portugal	6
15	Velo ‘v	Public Transport	France	6
16	A23 Beira	Toll Roads	Portugal	5/6
17	Elefsina Khorinthos Patra Pyrgos Tsakona Motorway	Toll Roads	Greece	5/6
18	Via Invest Zaventem	Toll Roads	Belgium	5/6
19	Brabo 1	Public Transport	Belgium	6
20	Athena International Airport	Airport	Greece	6
21	Metro de Malaga	Public Transport	Spain	6
22	M25 Motorway Orbital	Toll Roads	UK	5/6
23	Moreas Motorway	Toll Roads	Greece	5/6
24	Larnaca International Airport	Airport	Syprus	6
25	SEVICI	Public Transport	Spain	6
26	Terminal Muelle Costa at the Port of Barcelona	Terminal	Spain	6
27	C-16 Terrasa-Manresa Toll Notorway	Toll Roads	Spain	5/6
28	Millau Viaduct	Toll Roads	France	5
29	E75 Horgos Novi	Toll Roads	Serbia	5/6
30	Lusoponte Bridge	Bridge	Portugal	5/6
31	Coen Tunnel	Tunnel/Bridge	Netherlands	5
32	E39 Orkdalvegen Public Roads	Toll Roads	Norway	5/6
33	E18 Grimstad-Kristiansand	Toll Roads	Norway	5
34	Deurgankdocluis - Deurgancklock dock	Port	Belgium	6
35	Metro sul do Tejo (MST)	Public Transport	Portugal	6
36	E4 Helsinki	Toll Roads	Finland	5
37	E18 Muurla Lohja	Toll Roads	Finland	5/6
38	Bre Be Mi	Toll Rods	Italy	5/6
39	Larnaca Ports & Marine Development	Ports	Cyprus	6
40	Depot City PIlsen	Depot/Terminal	Czech R	6
41	Liefkenshoekspoorverbinding	Rail	Belgium	6
42	Fertagus	Rail	Portugal	6
43	Barcelona Europe	Port	Spain	6

*) chapter 5: contract stability and chapter 6: project on time and within budget

Annex C

Table C.1: Template Benefit projects

No	Topic	Value – Input	Comment
1.	Contracting Authority	Authority responsible on behalf of the Public Sector Please refer to the EC Definition of Public Entity (means a public sector body or a legal entity governed by private law with a public service mission providing adequate financial guarantees). Please describe its decision power with respect to awarding projects (budgets).	
2.	Project driven from a national or local level	☐ 1- Nationally driven ☐ 2 - Regionally driven ☐ 3 - Locally driven	This is described as a scale of 1 – 3 (national to local) Free text description in justification.
3.	Level of central government involvement	☐ 1- Absolute direct involvement ☐ 2 - Significant involvement ☐ 3 - Involvement ☐ 4 -Some involvement ☐ 5 - Limited involvement ☐ 6 - No involvement	Level of central government involvement described in a scale of 1-6. Please justify. It may also be a central agency responsible.

4.	At contract award, was there in the involved country a separate policy strategic document outlining an explicit policy strategy on PPPs? and to what extent it was published as a policy document?	1 ☐	2 ☐	3 ☐		1. No 2. Yes, published since five years before contract award & not updated 3. Yes, published since five years before contract award & updated
5.	At the moment of contract award, were there PPP programs outlining clear pipeline and time schedule for specific transport sectors? And to what extent was published as policy document?	1 ☐	2 ☐	3 ☐	4 ☐	1. No 2. Yes, but not clear pipe line & time schedule 3. Yes, clear pipe line & time schedule, but not updated 4. Yes, clear pipe line & time schedule and updated

6.	At the moment of contract award, to what extent was there political support at national/state government level towards PPP expressed?	1 ☐	2 ☐	3 ☐	4 ☐	1. Rather low political support by federal/state government 2. Moderate or stable political Support by state/Federal government 3. Rather strong political support by state/federal government 4. Strong or significantly political support by state/federal level government and mostly majority political parties on parliament
7.	At the moment of contract award, to what extent had the political commitment toward PPPs at national/state level changed over five years?	1 ☐	2 ☐	3 ☐	4 ☐	1. Significantly reduces political support 2. Reduces political support, but not significant 3. Increase for political support in some extent 4. Significantly increase in political support
8.	At the moment of contract award, did standard ex-ante evaluation instrument (for instance: Public Sector Comparator) for PPP project exist?	1 ☐	2 ☐	3 ☐	4 ☐	1. Not existing at the moment of contract award 2. Existing, but not mandatory to be used 3. Mandatory to be used beyond certain threshold 4. Mandatory for all projects
9.	Was there a standard contract used?	☐ Yes		☐ No		Please comment
10.	Was there a standard model (project set-up) of PPP project used?	☐ Yes		☐ No		Please comment
11.	At the moment of contract award, was there PPP or concession law?	☐ Yes		☐ No		Please comment
12.	At the moment of contract award, were there transport specific PPPs Law or concession law?	☐ Yes		☐ No		Please comment
13.	At the moment of contract award, were the procurement laws in line with EC directives (e.g. EC	☐ Yes		☐ No		Please comment

	guidelines (EU Directives 2004 / 17 / EC (Utilities))?					
14.	At the moment of contract award, did one or more PPP supporting Units exist at national/regional/provincial/local level?	☐ Yes		☐ No		
	If yes,	1	2	3	4	
14.a	What was the status of PPP Unit at contract award?	☐	☐	☐	☐	1. It did exist at contract award (though existed previously) 2. Dormant 3. Established within 5 years of contract award 4. Established five years before contract award.
14.b	At the moment of contract award, what was the legal form of the PPP unit? (if existing)	☐	☐	☐	☐	1. Public body under one ministry 2. Public body under many ministries 3. Private legal body with public participation 4. Private legal body with private participation
14.c	At the moment of contract award, what were the primary functions of PPP Unit? (if existing)	☐	☐	☐	☐	1. Promotion/dissemination 2. Promotion/dissemination & policy guidance or green lighting 3. Promotion/dissemination, policy guidance & green lighting 4. Promotion/dissemination, policy guidance, green lighting & capacity building and/or technical assistance

ANNEX D.

Table 3.A.1 **Comparison of the results of six different clustering methods**

Clusters	*Clustering Methods*					
	Nearest	*Furthest*	*Average*	*Centroid*	*Median*	*Ward's*
1	15 countries	8 countries	10 countries	13 countries	13 countries	6 countries
	AT, CH, CZ, DK, EE, FR, GR, IT, RS, SI, SE, CY, FL, SL, HU	AT, EE, RS, SI, SE, CY, FL, HU	AT, CH, CZ, DK, EE, SE, CY, FL, SL, HU	AT, CH, CZ, DK, EE,IT,RS, SI, SE, CY, FL, SL, HU	AT, CH, CZ, DK, EE,IT,RS, SI, SE, CY, FL, SL, HU	AT, EE, SE, CY, FL, HU
2	1 country	4 countries	4 countries	4 countries	4 countries	4 countries
	BE	BE, NL, UK, DE	BE, NL, UK, DE	BE, NL, UK, DE	BE, NL, UK, DE	BE, NL, UK, DE
3	3 countries	5 countries	5 countries	2 countries	2 countries	4 countries
	NL, UK, DE	CH, CZ, DK, IT, SL	FR, GR, PT, RS, SI	FR, PT	FR, PT	CH, CZ, DK, SL
2	1 country PT	3 countries FR, GR, PT	1 country IT	1 country GR	1 country GR	6 countries FR, GR, PT, IT, RS, SI

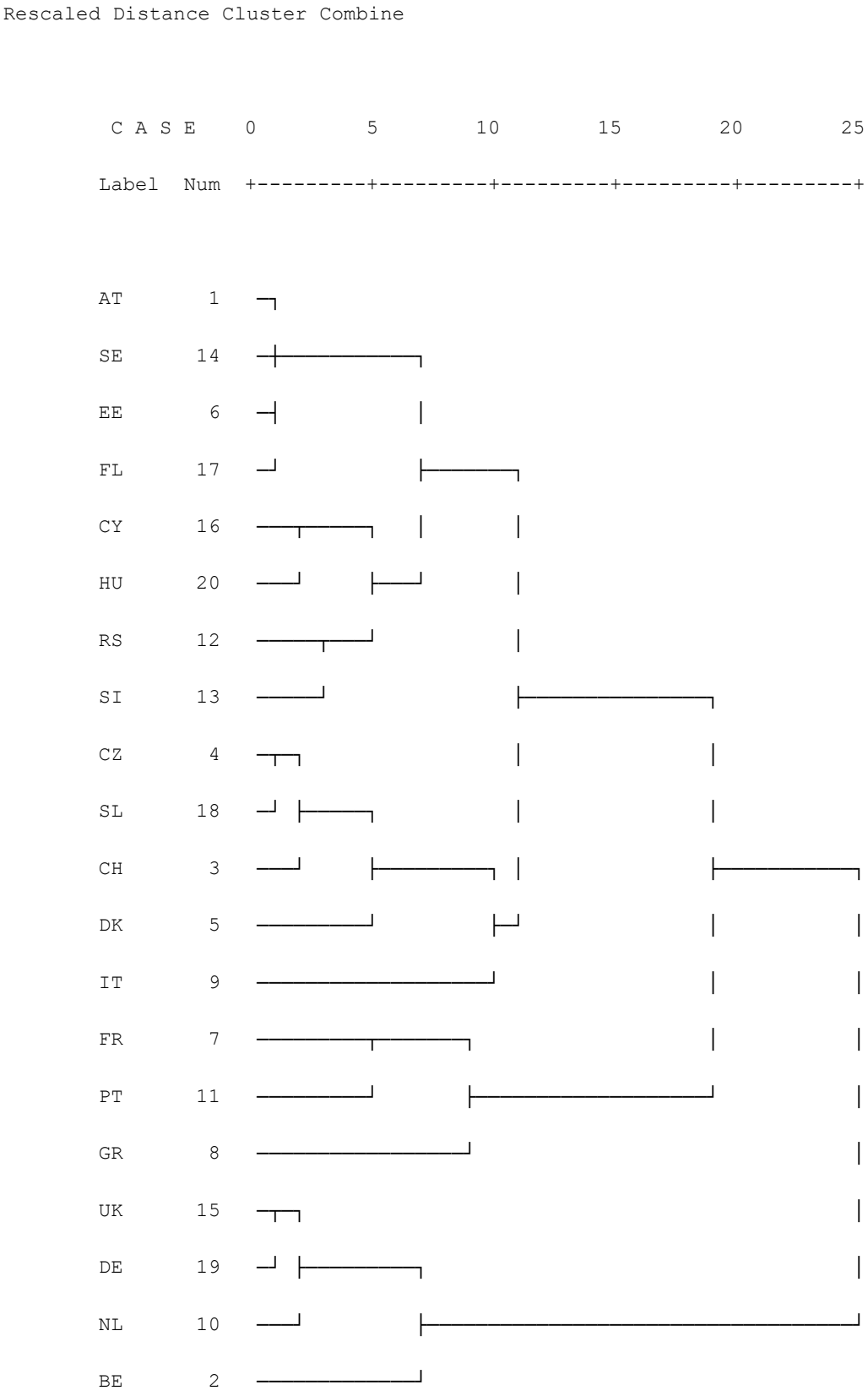

Figure 3.A.1 **Dendrogram hierarchical clustering PPP-GSI**

Annex E: The selection of conditions

Table E.1. Selection of variables, proxies and categories of conditions

No	Variables	Proxy	Category	Possible Yes/No	Rationales
1	Culture	Legal culture	Common Law & Civic law	No	Does not vary, between common law (UK) and civic law (others European Countries)
		Social Culture	Uncertainty Avoidance Index (uncertainty avoidance)	Yes	Index differs from 0 to 120
2	Polity and Politics	State structure	Centralized Unitary, Decentralized Unitary, Regionalized Unitary, Federal State	Yes	Varies among four types.
		Parliamentary system	Parliamentary, semi-presidential, presidential	No	Does not vary, almost all are parliamentary (excl.Cyprus & France)
		Executive structure	Minority government, Coalition government, Majority government	No	Does not vary, almost all are Coalition government (excl. UK)
3	Administrative Traditions	Administrative Traditions	Anglo American, Napoleonic, Germanic, Scandinavian, Soviet	No	Does not vary and problem in calibration
	Administrative History	NPM Driven Reforms	Marketizers; Modernizers (early, late, rather modest); Maintainers.	Yes	Varies among six types
4	Economic-Financial	GDP	The degree of GDP per-capita (Purchasing Power Standard/PPS)	Yes	Value differs from 0 to 175
			Real GDP per capita	Yes	Value differs from 3,562 euro/capita/year to 75,300 euro/capita/year
			Real GDP growth	Yes	Value differs from 0% to 6%
		Total government Debt	The percentage of total government debt	Yes	Value differs from 0 to 117
		Foreign exchange market (FEM)	FEM in aggregate	No	Not all countries selected & published every 3-years
		Credit Rating	CCC to AAA	No	countries & years selected at the time of evaluation
		Interest rate	Percentage of interest rate	No	Not all countries selected & data does not available yearly

Considering our analysis above, the selected variables and proxies for explanatory conditions are illustrated in table A.2.

Table E.2. Selected variables and proxies for explanatory conditions

No	Variables	Proxy	Category
1	Culture	Social Culture	Uncertainty Avoidance Index (uncertainty avoidance)
2	Polity and Politics	State structure	Centralized Unitary, Decentralized Unitary, Regionalized Unitary, Federal State
3	Administrative History	NPM Driven Reforms	Marketizers; Modernizers (Early, late, rather modest); Maintainers.
4	Economic-Financial	GDP per-capita	The degree of GDP per-capita
		Total government Debt	The percentage of total government Debt

Annex F: Calibration of the conditions

Table F.1: Distribution of cases and different values per outcome*)

Countries	PPP-GSI		Policy & political commitment		Legal & Regulatory Framework		PPP Supporting Institution	
	Value	Cal.	Value	Cal.	Value	Cal.	Value	Cal.
Austria	CL 5	0.2	CL 5	0.2	CL 4	0.4	CL 5	0.2
Belgium-Flanders	CL 2	0.8	CL 3	0.6	CL 3	0.6	CL 2	0.8
Switzerland	CL 4	0.4	CL 4	0.4	CL 4	0.4	CL 4	0.4
Czech Republic	CL 4	0.4	CL 4	0.4	CL 4	0.4	CL 4	0.4
Denmark	CL 4	0.4	CL 4	0.4	CL 5	0.2	CL 4	0.4
Estonia	CL 5	0.2	CL 5	0.2	CL 5	0.2	CL 5	0.2
France	CL 3	0.6	CL 5	0.2	CL 2	0.8	CL 2	0.8
Greece	CL 3	0.6	CL 5	0.2	CL 2	0.8	CL 4	0.4
Italy	CL 4	0.4	CL 3	0.6	CL 4	0.4	CL 4	0.4
Netherlands	CL 2	0.8	CL 2	0.8	CL 4	0.4	CL 2	0.8
Portugal	CL 3	0.6	CL 3	0.6	CL 2	0.8	CL 3	0.6
Serbia	CL 5	0.2	CL 5	0.2	CL 3	0.6	CL 4	0.4
Slovenia	CL 5	0.2	CL 5	0.2	CL 3	0.6	CL 4	0.4
Sweden	CL 5	0.2	CL 5	0.2	CL 4	0.4	CL 5	0.2
The United Kingdom	CL 2	0.8	CL 2	0.8	CL 4	0.4	CL 2	0.8
Cyprus	CL 5	0.2	CL 5	0.2	CL 4	0.4	CL 4	0.4
Finland	CL 5	0.2	CL 5	0.2	CL 4	0.4	CL 5	0.2
Slovak Republic	CL 4	0.4	CL 4	0.4	CL 4	0.4	CL 4	0.4
Germany	CL 2	0.8	CL 2	0.8	CL 4	0.4	CL 2	0.8
Hungary	CL 5	0.2	CL 5	0.2	CL 4	0.4	CL 4	0.4

***)** Verhoest, K et al. (2015); Murwantara,Soecipto et.al (2016).

Table F.2: Distribution of cases and different values per condition

Countries	State structure*)		NPM Driven Reformers**)		Uncertainty Avoidance Index (UAI)***)		The Evolution of GDP per capita****)		The Evolution of government debt*****)	
	Value	Cal.	Value	Cal.	Value	Cal.	Value	Cal.	Value	Cal.
Austria	FED	0.00	Rather Modest	0.2	70	0.6	34.100	0.64	66.72	0.60
Belgium-Flanders	DEC	0.67	Late	0.4	94	0.8	32.731	0.62	96.32	0.90
Switzerland	FED	0.00	Late	0.4	58	0.4	52.623	0.85	42.82	0.26
Czech Republic	CEN	1.00	Rather Modest	0.2	74	0.6	13.654	0.17	30.66	0.15
Denmark	DEC	0.67	Early	0.6	23	0.2	43.785	0.76	42.28	0.26
Estonia	CEN	1.00	Early	0.6	60	0.4	10.677	0.12	5.63	0.04
France	DEC	0.67	Late	0.4	86	0.8	30.454	0.58	69.88	0.63
Greece	DEC	0.67	Rather Modest	0.2	112	1.0	19.938	0.34	117.75	0.97
Italy	REG	0.33	Late	0.4	75	0.6	27.546	0.54	110.29	0.95
Netherlands	DEC	0.67	Early	0.6	53	0.4	36.692	0.67	55.62	0.43
Portugal	DEC	0.67	Rather Modest	0.2	104	1.0	16.631	0.24	74.50	0.70
Serbia	CEN	1.00	Maintainer	0.0	92	0.8	3.562	0.05	41.07	0.30
Slovenia	DEC	0.67	Rather Modest	0.2	88	0.8	16.677	0.24	31.40	0.15
Sweden	DEC	0.67	Early	06	29	0.2	37.623	0.68	45.88	0.30
The United Kingdom	REG	0.33	Marketizer	1.0	35	0.2	28.646	0.56	53.80	0.41
Cyprus	CEN	1.00	Rather Modest	0.2	59	0.4	22.462	0.42	65.06	0.58
Finland	DEC	0.67	Early	0.6	59	0.4	34.054	0.64	43.22	0.27
Slovak Republic	REG	0.33	Late	0.4	51	0.4	10.577	0.12	40.08	0.23
Germany	FED	0.00	Late	0.4	65	0.6	30.400	0.58	69.05	0.63
Hungary	DEC	0.67	Late	0.4	82	0.8	9.446	0.10	71.23	0.66

*) Pollitt & Bouckaert (2011); Committee of the Region, EU (2012); EIU (-), Government at a glance , OECD(2011)

****)** Pollitt & Bouckaert (2004); Kickert, W (2011); Kovak, P (2011); Dzinic, J (2011); Nemec (2009)

*****)** Hofstede Dimension of Culture: (1) 1-20; (2) 21-40; (3) 41-60; (4) 61-80; (5) 81-100; (6) 101-120

******)** Direct Calibration-EUROSTAT (2013)

*******)** Direct Calibration-EUROSTAT (2013) & www.tradingeconomics.com **(**Switzerland, Serbia, Hungary**)**

Annex G.1. Truth Table PPP in general

POSITIVE OUTCOME

NPM	STATE	UAI	GDPP	DEBT	OUT	n	incl	PRI	cases
0	1	1	1	1	1	2	0.935	0.743	2,7
1	0	0	1	0	1	1	0.928	0.717	15
0	0	1	1	1	0	3	0.867	0.512	1,9,19
0	1	0	0	1	0	1	0.839	0.191	16
0	1	1	0	1	0	3	0.831	0.448	8,11,20
0	0	0	0	0	0	1	0.823	0.330	18
1	1	0	0	0	0	1	0.814	0.277	6
0	0	0	1	0	0	1	0.809	0.312	3
1	1	0	1	0	0	4	0.747	0.333	5,10,14,17
0	1	1	0	0	0	3	0.652	0.065	4,12,13

Cut off consistency ratio 0,93.

We found three non essential prime implicants ("model ambiguity") (Baumgartner & Thiem, 2017) which are PI 1; ~NPM STATE GDPP, PI 2; STATE UAI GDPP and PI 3: STATE GDPP DEBT. As suggested by Legewie (2013) (see also User's Guide fs QCA by Ragin & Robinson, 2017), we selected the prime implicant based on our substantive and theoretical knowledge which is PI 3 (also PI 2). Subsequently, two parsimonious solutions arised NPM*~STATE and STATE*GDPP*DEBT, yielding the intermediate solutions NPM*~STATE*GDPP + STATE*UAI*GDPP*DEBT -> PPP. As suggested by Baumgartner & Thiem (2017), we have further performed analysis by increasing and lowering the cut-off consistency ratio. We can conclude that this is the best model for explaining high levels of PPP GSI. We do not select PI 1, because this deviates with our proposition.
Note: This results are confirmed when using software R3.1.6.

NEGATIVE OUTCOME

NPM	STATE	UAI	GDPP	DEBT	OUT	n	incl	PRI	cases
0	1	1	0	0	1	3	0.976	0.935	4,12,13
0	1	0	0	1	1	1	0.962	0.809	16
1	1	0	0	0	1	1	0.929	0.723	6
0	0	0	1	0	0	1	0.913	0.688	3
0	0	0	0	0	0	1	0.913	0.670	18
1	1	0	1	0	0	4	0.874	0.667	5,10,14,17
0	0	1	1	1	0	3	0.860	0.488	1,9,19
0	1	1	0	1	0	3	0.839	0.472	8,11,20
1	0	0	1	0	0	1	0.818	0.283	15
0	1	1	1	1	0	2	0.813	0.257	2,7

Cut off consistency ratio 0,929

No non-essential prime implicants.

Note: When software R3.1.6 was used, we found nine non-essential prime implicants with different intermediate outcome.
We refer to the results of using fsQCA 3.1, since these results were also confirmed by the previous software (fsQCA 2.5).

Annex G.2. Truth table PPP policy and political commitment

POSITIVE OUTCOME

NPM	STATE	UAI	GDPP	DEBT	OUT	n	incl	PRI	cases
1	0	0	1	0	1	1	0.928	0.717	15
0	0	1	1	1	0	3	0.841	0.471	1,9,19
0	1	0	0	1	0	1	0.839	0.191	16
0	0	0	0	0	0	1	0.823	0.330	18
1	1	0	0	0	0	1	0.814	0.277	6
0	1	1	1	1	0	2	0.811	0.336	2,7
0	0	0	1	0	0	1	0.809	0.312	3
1	1	0	1	0	0	4	0.747	0.333	5,10,14,17
0	1	1	0	1	0	3	0.715	0.178	8,11,20
0	1	1	0	0	0	3	0.621	0.060	4,12,13

Cut off consistency ratio 0,928

No non-essential prime implicants

Note: This results are confirmed with software R3.1.6.

NEGATIVE OUTCOME

NPM	STATE	UAI	GDPP	DEBT	OUT	n	incl	PRI	cases
0	1	1	0	0	1	3	0.976	0.940	4,12,13
0	1	0	0	1	1	1	0.962	0.809	16
1	1	0	0	0	1	1	0.929	0.723	6
0	1	1	0	1	1	3	0.925	0.784	8,11,20
0	0	0	1	0	1	1	0.913	0.688	3
0	0	0	0	0	1	1	0.913	0.670	18
0	1	1	1	1	0	2	0.904	0.664	2,7
1	1	0	1	0	0	4	0.874	0.667	5,10,14,17
0	0	1	1	1	0	3	0.858	0.529	1,9,19
1	0	0	1	0	0	1	0.818	0.283	15

Cut off consistency ratio 0,91

We found two non essential prime implicants ("model ambiguity") (Baumgartner & Thiem, 2017) which are PI 1; ~NPM ~DEBT and PI 2: ~NPM ~UAI. We selected the prime implicant based on our substantive and theoretical knowledge which is PI 1. FsQCA 3.1 produces two parsimonious solutions ~GDPP and ~NPM*~DEBT yielding the intermediate solution ~NPM*~GDPP + ~UAI*~GDPP*~DEBT + ~NPM*~STATE*~UAI*~DEBT -> ~POL. Fortunately, the two PIs yield the same results.

Note: This results are confirmed with software R3.1.6

Annex G.3. Truth table PPP legal and regulatory framework

POSITIVE OUTCOME

NPM	STATE	UAI	GDPP	DEBT	OUT	n	incl	PRI	cases
0	1	1	1	1	1	2	1.000	1.000	2,7
0	1	1	0	1	1	3	0.962	0.852	8,11,20
0	1	0	0	1	0	1	0.936	0.000	16
0	0	0	0	0	0	1	0.930	0.000	18
1	0	0	1	0	0	1	0.920	0.000	15
0	0	0	1	0	0	1	0.905	0.000	3
0	1	1	0	0	0	3	0.894	0.540	4,12,13
0	0	1	1	1	0	3	0.886	0.366	1,9,19
1	1	0	0	0	0	1	0.880	0.000	6
1	1	0	1	0	0	4	0.755	0.000	5,10,14,17

Cut off consistency ratio 0,96

No non-essential prime implicant

Note: However, this results are quite different compared to the results with software R3.1.6. With this software, four non-essential prime implicant exist.

NEGATIVE OUTCOME

NPM	STATE	UAI	GDPP	DEBT	OUT	n	incl	PRI	cases
1	1	0	1	0	1	4	1.000	1.000	5,10,14,17
0	0	0	0	0	1	1	1.000	1.000	18
0	0	0	1	0	1	1	1.000	1.000	3
0	1	0	0	1	1	1	1.000	1.000	16
1	0	0	1	0	1	1	1.000	1.000	15
1	1	0	0	0	1	1	1.000	1.000	6
0	0	1	1	1	1	3	0.934	0.634	1,9,19
0	1	1	0	0	0	3	0.844	0.323	4,12,13
0	1	1	1	1	0	2	0.818	0.000	2,7
0	1	1	0	1	0	3	0.784	0.148	8,11,20

Cut off consistency ratio 0,934

We found two non-essential prime implicants (“model ambiguity”) (Baumgartner & Thiem, 2017) which are PI 1: ~STATE ~UAI GDPp ~DEBT and PI 2: NPM ~UAI GDPp ~DEBT. We selected the prime implicant based on our substantive and theoretical knowledge which is PI 1. Subsequently fsQCA 3.1 produces two parsimonious solutions ~UAI and ~STATE yielding the intermediate solution ~UAI*~DEBT + ~NPM*~STATE + ~NPM*~UAI*~GDP -> ~LEG. Fortunately, the two PIs yield the same results.
Note: However, we did not find non-essential prime implicants using software R316

Annex G.4. Truth table PPP supporting arrangements

POSITIVE OUTCOME

NPM	STATE	UAI	GDPP	DEBT	OUT	n	incl	PRI	cases
0	1	1	1	1	1	2	0.983	0.933	2,7
1	0	0	1	0	1	1	0.928	0.717	15
0	1	0	0	1	0	1	0.898	0.271	16
0	1	1	0	1	0	3	0.887	0.549	8,11,20
0	0	1	1	1	0	3	0.867	0.558	1,9,19
0	0	0	0	0	0	1	0.823	0.330	18
1	1	0	0	0	0	1	0.814	0.277	6
0	0	0	1	0	0	1	0.809	0.312	3
0	1	1	0	0	0	3	0.790	0.210	4,12,13
1	1	0	1	0	0	4	0.747	0.333	5,10,14,17

Cut off consistency ratio 0,928

We found three non essential prime implicants ("model ambiguity") (Baumgartner & Thiem, 2017) which are PI 1; ~NPM STATE GDPP, PI 2; STATE UAI GDPP and PI 3: STATE GDPP DEBT. We selected the prime implicant based on our substantive and theoretical knowledge which is PI 3 (also PI 2). Subsequently two parsimonious solutions arised NPM*~STATE and STATE*GDPP*DEBT yielding the intermediate solutions NPM*~STATE*GDPP + STATE*UAI*GDPP*DEBT → SUPP. As suggested by Baumgartner & Thiem (2017), we have further performed by increasing and lowering the cut-off consistency ratio. Thus, we can conclude that this is the best model for explaining high levels of PPP supporting arrangements. We do not select PI 1, because this deviates with our proposition.

NEGATIVE OUTCOME

NPM	STATE	UAI	GDPP	DEBT	OUT	n	incl	PRI	cases
0	1	0	0	1	1	1	0.962	0.729	16
1	1	0	0	0	1	1	0.929	0.723	6
0	0	0	1	0	1	1	0.913	0.688	3
0	0	0	0	0	1	1	0.913	0.670	18
0	1	1	0	0	0	3	0.913	0.671	4,12,13
1	1	0	1	0	0	4	0.874	0.667	5,10,14,17
0	1	1	0	1	0	3	0.839	0.353	8,11,20
0	0	1	1	1	0	3	0.832	0.442	1,9,19
1	0	0	1	0	0	1	0.818	0.283	15
0	1	1	1	1	0	2	0.765	0.067	2,7

Cut off consistency ratio 0,91

No non-essential pime implicant

Note: When software R3.1.6 was used, we found seven non-essential prime implicants with different intermediate outcome.

Annex H.1. Graph presence & absence high PPP-GSI

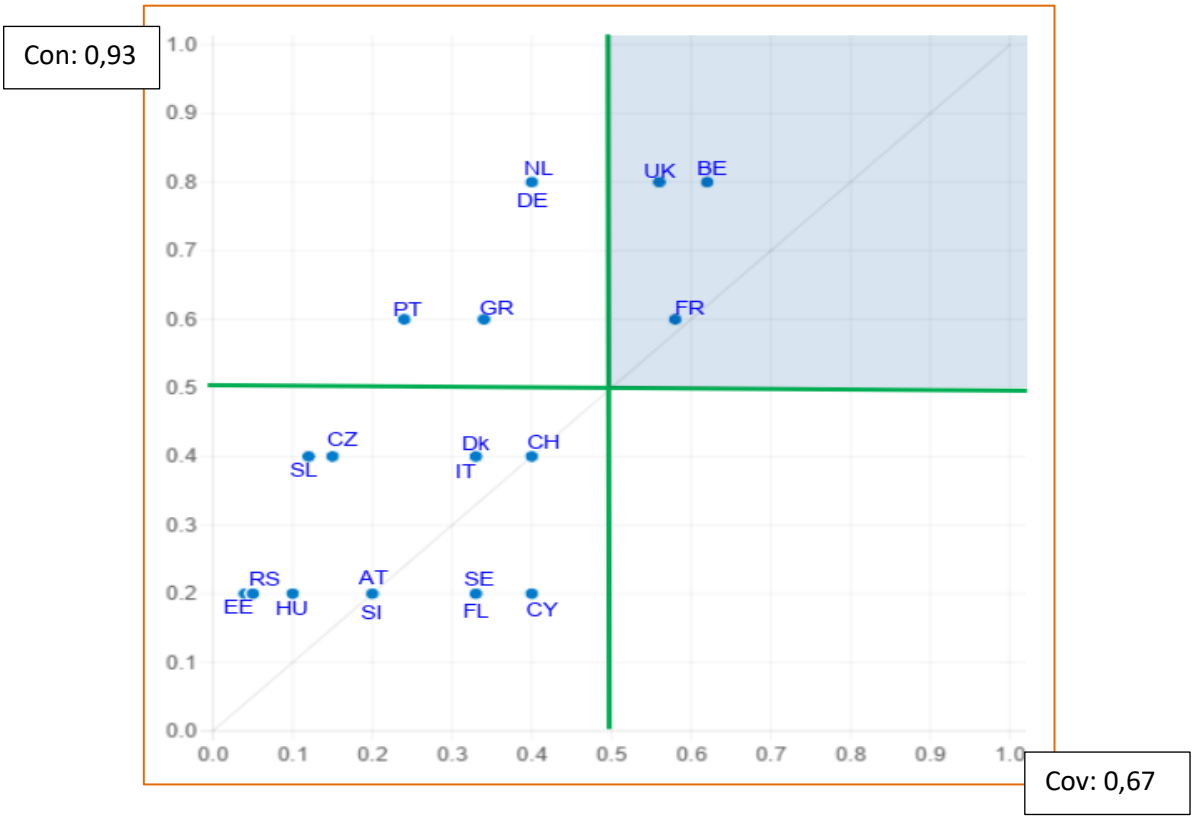

Figure H.1a XY plot presence of high PPP-GSI

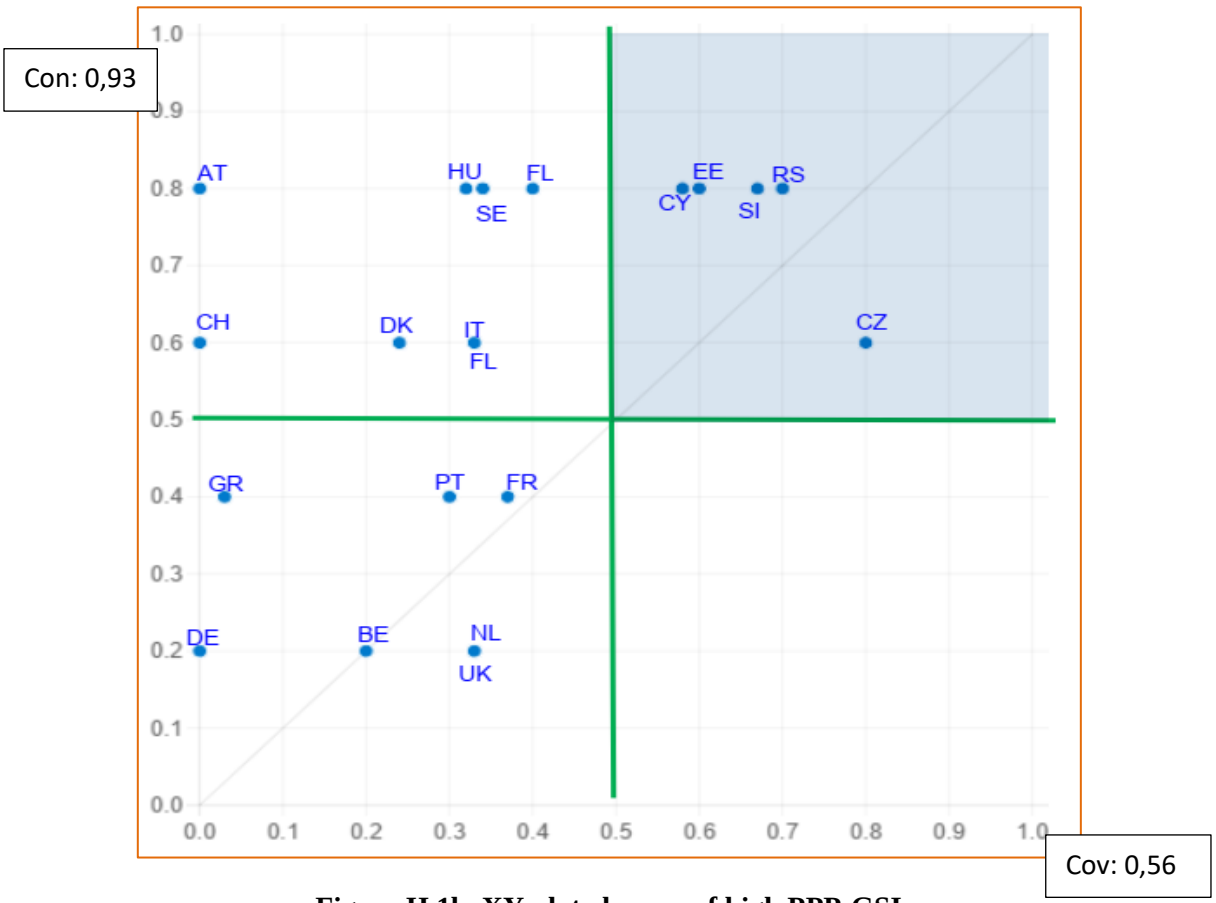

Figure H.1b. XY plot absence of high PPP-GSI

Annex H.2. Graph presence and absence high levels of policy and political commitment

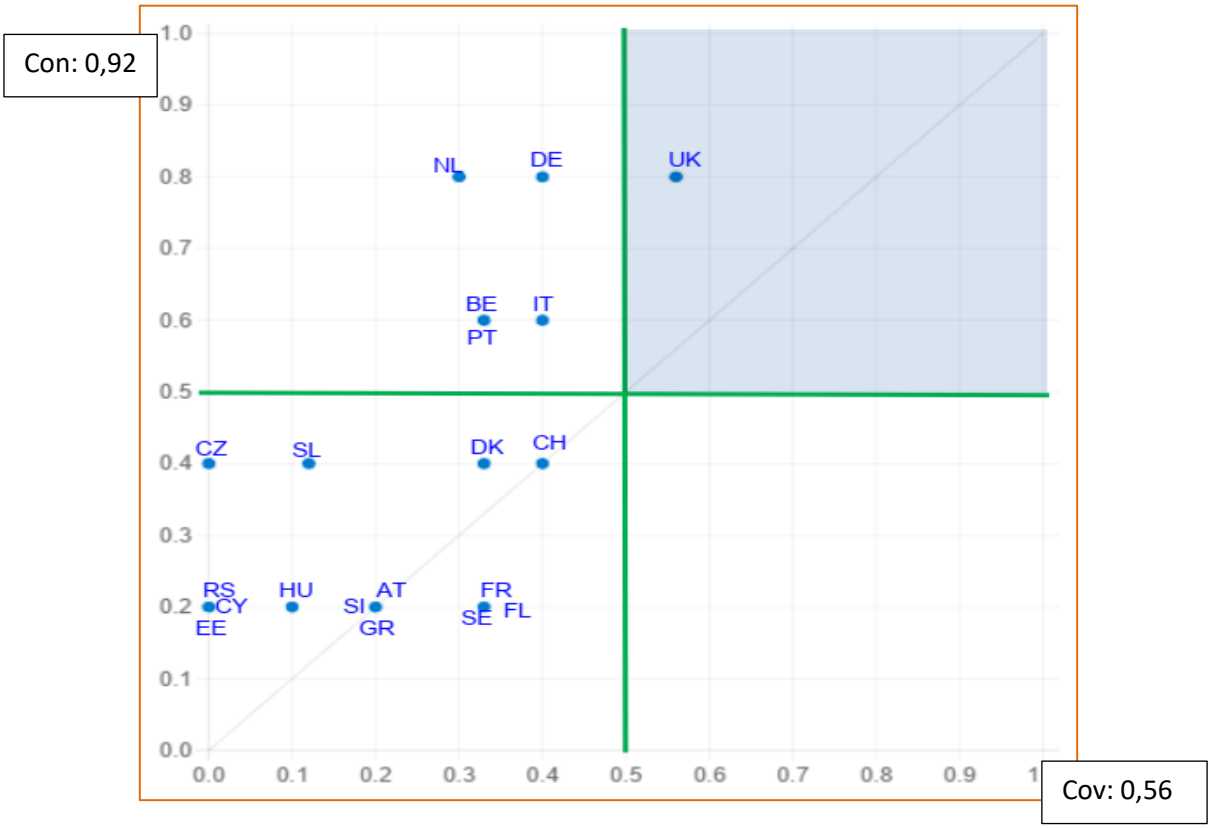

Figure H.1a. XY plot presence of high levels of policy and political commitment

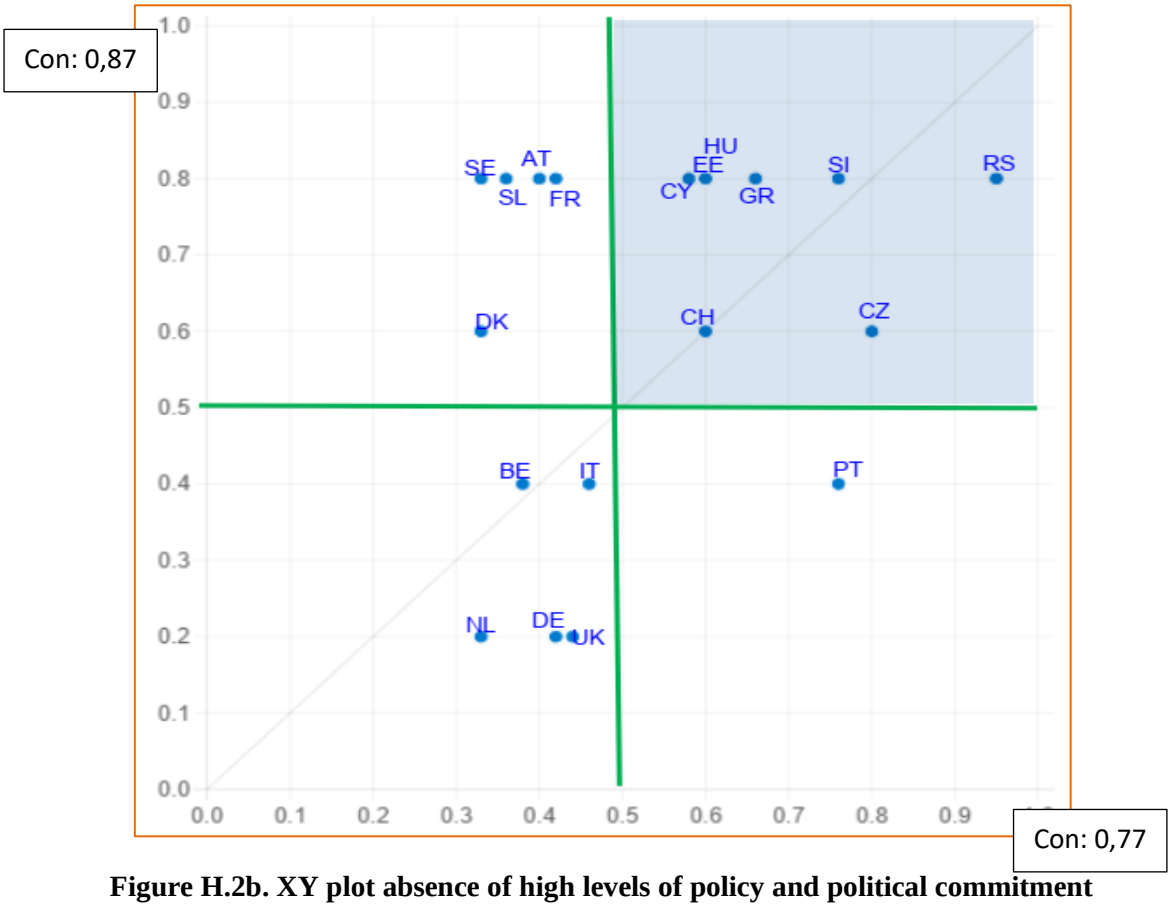

Figure H.2b. XY plot absence of high levels of policy and political commitment

Annex H.3. Graph presence and absence high levels of legal and regulatory framework

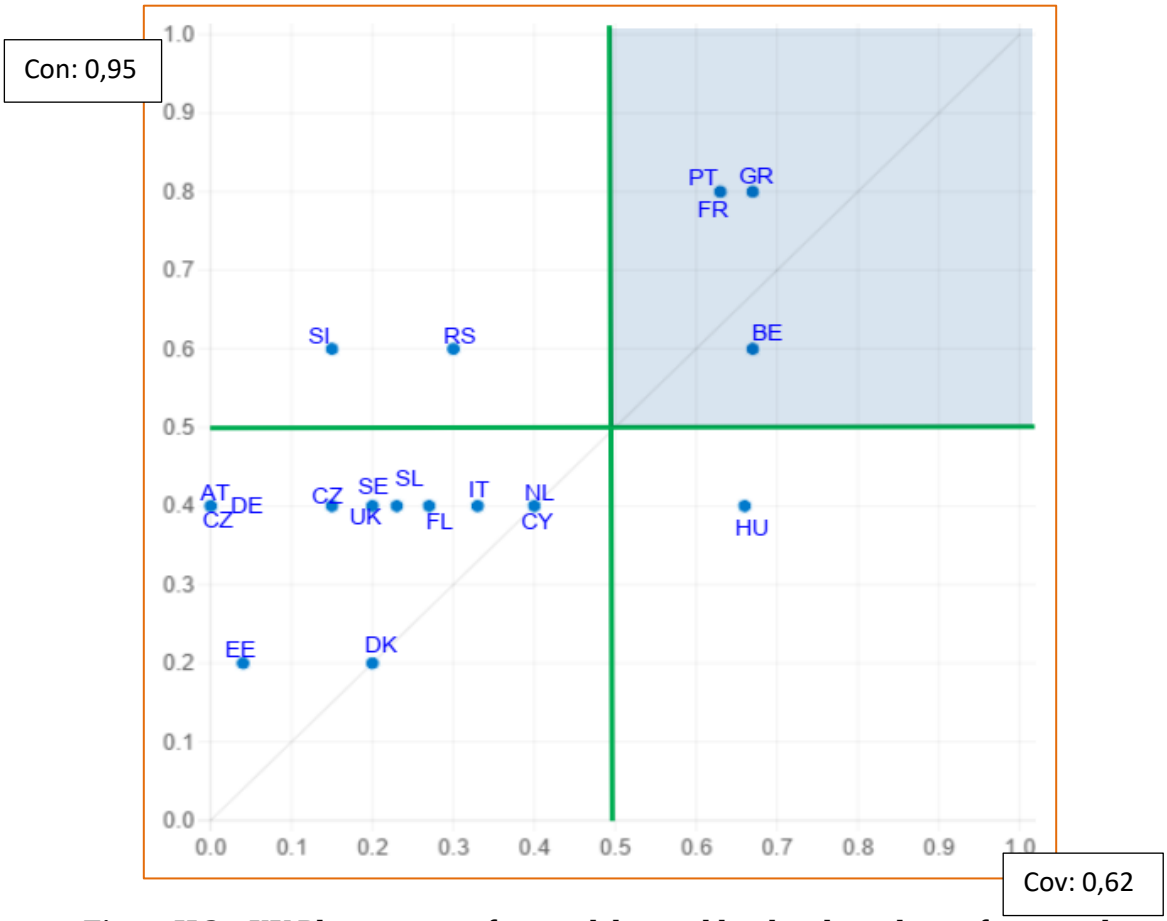

Figure H.3a. XY Plot presence of more elaborated legal and regulatory framework

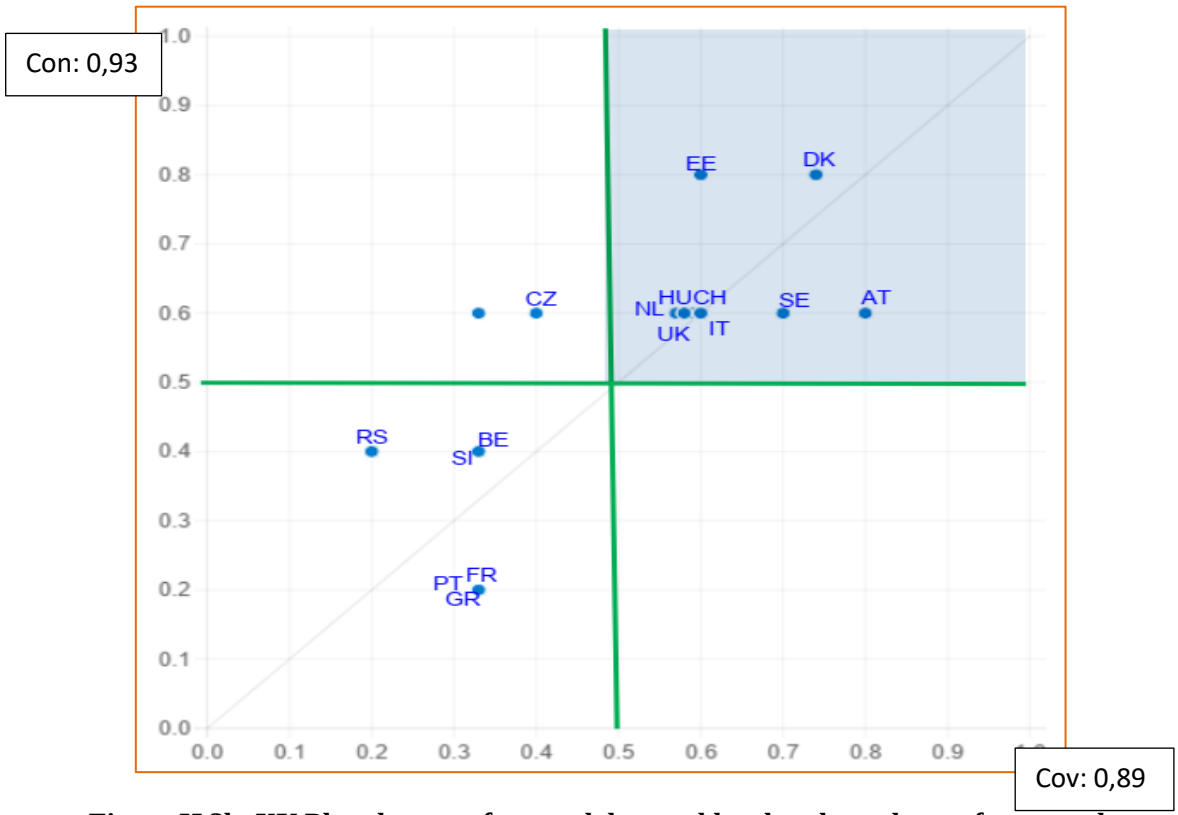

Figure H.3b. XY Plot absence of more elaborated legal and regulatory framework

Annex H.4. Graph presence and absence high levels PPP supporting arrangement

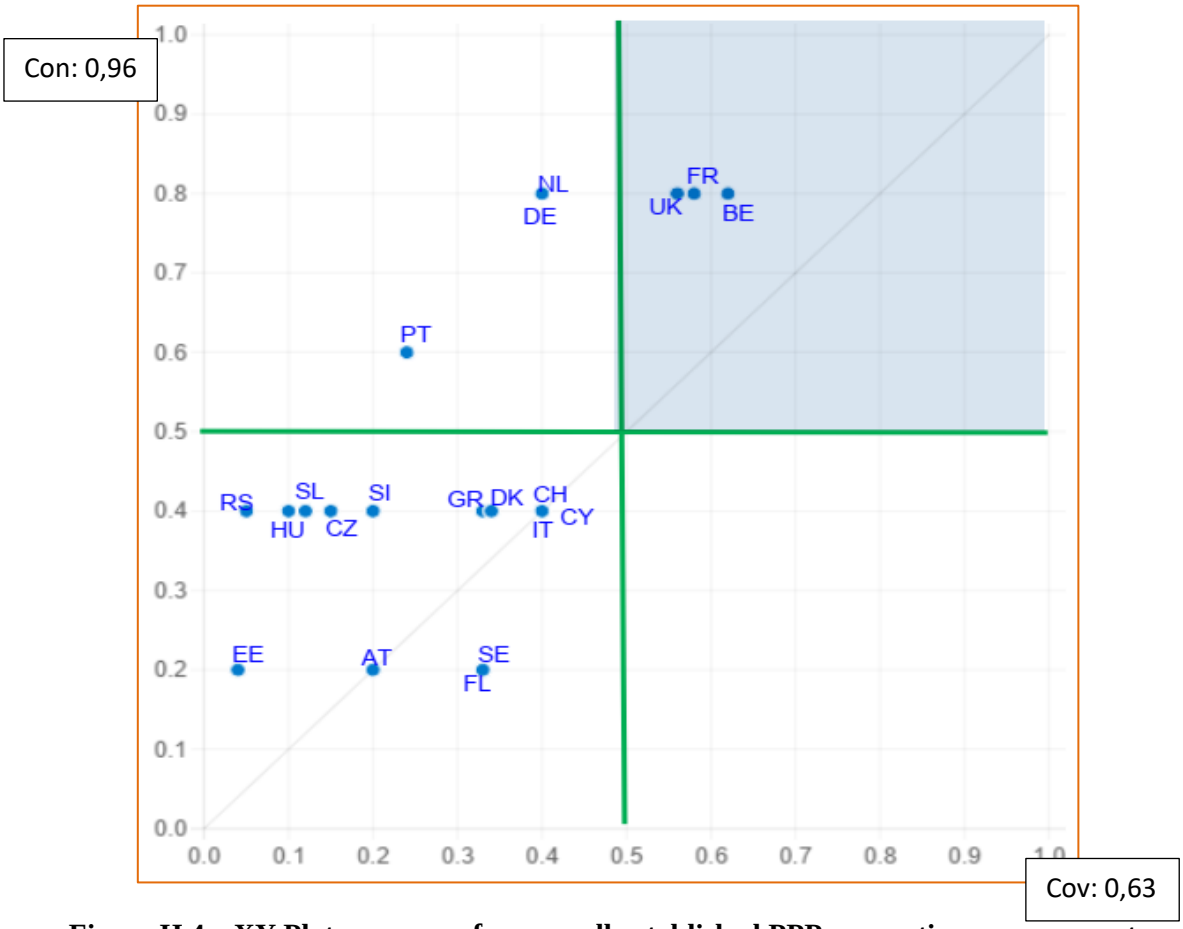

Figure H.4a. XY Plot presence of more well-established PPP supporting arrangements

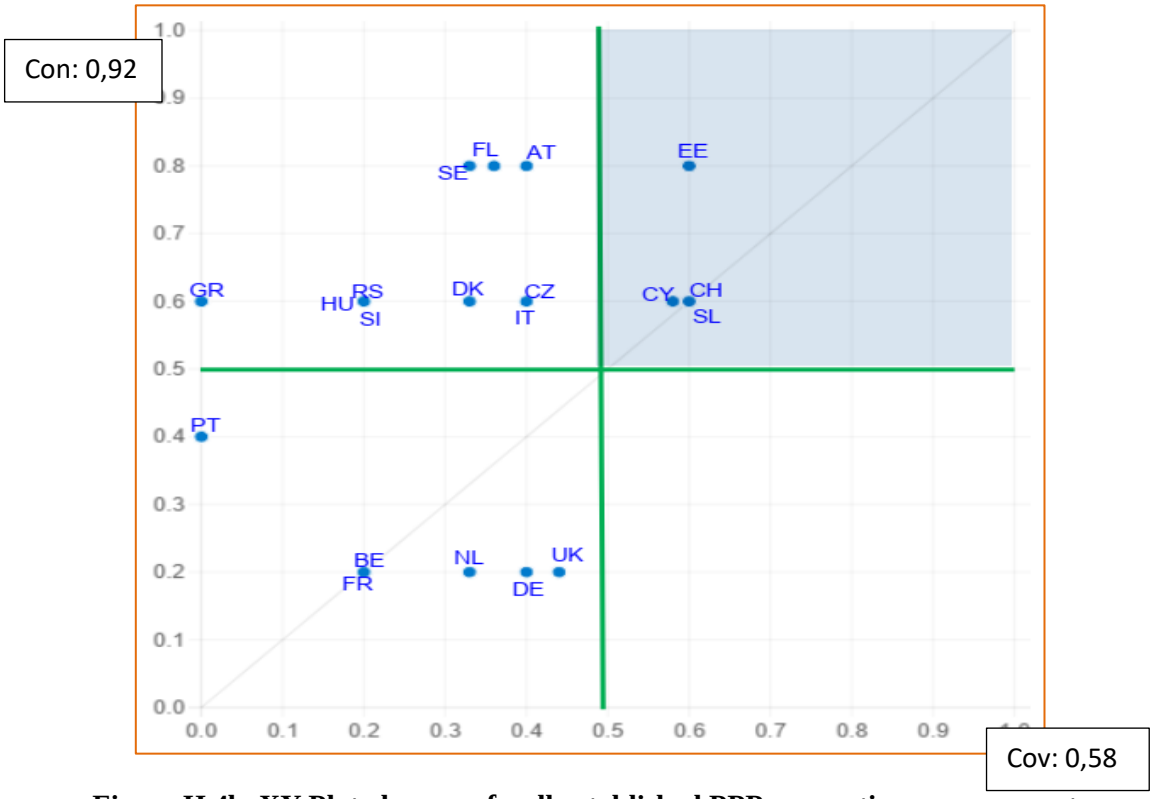

Figure H.4b. XY Plot absence of well-established PPP supporting arrangements

Annex I

Table. I.1: Mapping typology of countries referrring the configurations and dimensions of PPP GSI

Countries	Group	High Policy & political Commitment		High legal & regulatory framework		High Supporting Arrangements	
		Presence	Absence	Presence	Absence	Presence	Absence
Austria	4				~state*~ref		
Belgium-Flanders	1			debt*uai*state		debt*gdpp*uai*state	
Switzerland	5		~debt*~uai*~state*~ref		~state*~ref ~debt*~uai		~debt*~uai*~state*~ref
Czech Republic	2		~gdpp*~ref				~debt*~gdpp*~ref
Denmark	3				~debt*~uai		
Estonia	Non G		~debt*~gdpp*~uai		~debt*~uai		~debt*~gdpp*~uai
France	1			debt*uai*state		debt*gdpp*uai*state	
Greece	6		~gdpp*~ref	debt*uai*state			
Italy	4				~state*~ref		
Netherlands	3				~debt*~uai		
Portugal	6		~gdpp*~ref	debt*uai*state			
Serbia	2		~gdpp*~ref				~debt*~gdpp*~ref
Slovenia	2		~gdpp*~ref				~debt*~gdpp*~ref
Sweden	3				~debt*~uai		
United Kingdom	Non G	gdpp*~state*ref			~debt*~uai	gdpp*~state*ref	
Cyprus	Non G		~gdpp*~ref		~gdpp*~uai*~ref		~gdpp*~uai*~ref
Finland	3				~debt*~uai		
Slovakia	5		~gdpp*~ref ~debt*~gdpp*~uai ~debt*~uai*~state*~ref		~state*~ref ~debt*~uai ~gdpp*~uai*~ref		~gdpp*~uai*~ref ~debt*~gdpp*~ref ~debt*~gdpp*~uai ~debt*~uai*~state*~ref
Germany	4				~state*~ref		
Hungary	Non G		~gdpp*~ref				

SUMMARY:

GROUP 1 : High level of legal & regulatory framework and suporting arrangements: debt*uai*state AND debt*gdpp*uai*state →**BE & FR**
GROUP 2 : Low level of policies and supporting arrangements: ~gdpp*~ref AND ~debt*~gdpp*~ref → **CZ,RS, & SI**
GROUP 3 : Low level of legal & regulatory framework: ~debt*~uai → **DK,NL,SE & FL**
GROUP 4 : Low level of legal & regulatory framework: ~state*~ref → **AT, IT & DE**
GROUP 5 : Low level of all dimensions: ~debt*~uai*~state*~ref AND ~state*~ref **OR** ~debt*~uai AND ~debt*~uai*~state*~ref → **CH & SL**
GROUP 6: High level of legal & regulatory framework, but low policies : debt*uai*state AND ~gdpp*~ref → **GR & PT**

OTHERS:
High level of Policy & political commitment & high supporting arrangements, but low legal & regulatory framework:*:* gdpp*~state*ref AND ~debt*~uai → **UK**
Low level of all dimensions: ~debt*~gdpp*~uai AND ~debt*~uai → **EE**
Low level of all dimensions: ~gdpp*~ref AND ~gdpp*~uai*~ref → **CY**
Low level of policy & political commitment: ~gdpp*~ref → **HU**

Annex J. Table J.1: Calibration of outcomes and conditions

No	Projects	OUTCOME				PPP-GSI		Policies & political		Legal & regulatory		Supporting Arrangement		The level of country competitiveness		Quality of Tendering Process		Financing Scheme		Guarantees		Risk Allocation	
		Cost	Cal.	Time	Cal.	Val	Cal.	Val.	Cal.	Val.	Cal.	Val.	Cal.	Val.	Cal.	Val.	Cal.	Val.	Cal.	Val.	Cal.	Value	Cal.
1	Attiki Odos	On cost	0.8	On time	0.8	CL4	0.4	CL2	0.4	CL4	0.2	CL4	0.2	0.57	0.39	CL 3	0.4	Mostly not optimal financing	0.2	Full guarantee	1.0	Rather inappropriate	0.4
2	Bre Be Mi	Cost overrun	0.0	Delay	0.0	CL4	0.4	CL2	0.6	CL4	0.2	CL4	0.2	0.47	0.12	CL 3	0.4	Mostly optimal financing	0.8	No guarantee	0.0	Rather appropriate	0.6
3	Piraeus Container	On cost	0.8	Delay	0.0	CL3	0.6	CL2	0.4	CL2	0.6	CL4	0.2	0.46	0.11	CL 1	0.8	The least optimal financing	0.0	No guarantee	0.0	Rather appropriate	0.6
4	E75 Horgos Novi	Cost overrun	0.0	Delay	0.0	CL6	0	CL4	0.2	CL2	0.6	CL4	0.2	0.50	0.18	CL 1	0.8	Mostly not optimal financing	0.2	No guarantee	0.0	Mostly appropriate	0.8
5	Central Greece Motorway	Cost overrun	0.0	Delay	0.0	CL3	0.6	CL2	0.4	CL2	0.6	CL4	0.2	0.44	0.08	CL 2	0.6	The least optimal financing	0.0	Full guarantee	1.0	Mostly appropriate	0.8
6	BNRR (M6) Tollway	On cost	0.8	On time	0.8	CL1	1	CL1	0.8	CL4	0.2	CL2	0.6	0.66	0.71	CL 4	0.2	Rather optimal financing	0.6	No guarantee	0.0	Rather appropriate	0.6
7	M80 Stepps to Haggs	On cost	0.8	On time	0.8	CL1	1	CL1	0.8	CL4	0.2	CL1	0.8	0.63	0.61	CL 4	0.2	Rather optimal financing	0.6	No guarantee	0.0	Rather inappropriate	0.4
8	A19 Dishfort	On cost	0.8	On time	0.8	CL1	1	CL1	0.8	CL4	0.2	CL1	0.8	0.64	0.65	CL 4	0.2	Rather optimal financing	0.6	No guarantee	0.0	Rather inappropriate	0.4
9	Metrolink Manchester	On cost	0.8	On time	0.8	CL1	1	CL1	0.8	CL4	0.2	CL2	0.6	0.64	0.65	CL 1	0.8	Rather optimal financing	0.6	Partial guarantee	0.8	Fully appropriate	1.0
10	A22-Algarve	On cost	0.8	On time	0.8	CL5	0.2	CL4	0.2	CL2	0.6	CL2	0.4	0.56	0.35	CL 3	0.4	Rather optimal financing	0.6	Partial guarantee	0.8	Rather inappropriate	0.4
11	Radial 2	Cost overrun	0.0	Delay	0.0	CL3	0.6	CL1	0.8	CL2	0.6	CL2	0.4	0.64	0.65	CL 1	0.8	Rather not optimal	0.4	Partial guarantee	0.8	Mostly inappropriate	0.2
12	Eje Aeroporto	Cost overrun	0.0	Delay	0.0	CL3	0.6	CL1	0.8	CL2	0.6	CL2	0.4	0.65	0.68	CL 1	0.8	The least optimal financing	0.0	Partial guarantee	0.8	Rather inappropriate	0.4
13	M 45	Cost overrun	0.0	On time	0.8	CL3	0.6	CL1	0.8	CL2	0.6	CL4	0.2	0.64	0.65	CL 1	0.8	Mostly optimal financing	0.8	No guarantee	0.0	Rather inappropriate	0.4
14	Port of Sines	Cost underrun	1.0	Delay	0.0	CL5	0.2	CL4	0.2	CL2	0.6	CL2	0.4	0.59	0.46	CL 4	0.2	Mostly not optimal financing	0.2	Partial guarantee	0.8	Rather inappropriate	0.4
15	Velo ‘v	Cost overrun	0.0	On time	0.8	CL5	0.2	CL4	0.2	CL1	0.8	CL1	0.8	0.64	0.65	CL 4	0.2	The least optimal financing	0.0	Partial guarantee	0.8	Rather inappropriate	0.4
16	A23 Beira	On cost	0.8	On time	0.8	CL5	0.2	CL4	0.2	CL2	0.6	CL2	0.4	0.56	0.35	CL 1	0.8	Mostly not optimal financing	0.2	Partial guarantee	0.8	Rather inappropriate	0.4
17	E39 Orkdalvegen	On cost	0.8	On time	0.8	CL6	0	CL4	0.2	CL4	0.2	CL4	0.2	0.78	0.94	CL 1	0.8	Rather not optimal	0.4	Partial guarantee	0.8	Rather inappropriate	0.4
18	Elefsina Khorinthos	Cost overrun	0.0	Delay	0.0	CL3	0.6	CL2	0.4	CL2	0.6	CL4	0.2	0.44	0.08	CL 2	0.6	The least optimal financing	0.0	Full guarantee	1.0	Mostly appropriate	0.8
19	Brabo 1	Cost overrun	0.0	Ahead schedule	1.0	CL1	1	CL2	0.6	CL2	0.4	CL1	0.8	0.66	0.71	CL 1	0.8	Mostly optimal financing	0.8	Full guarantee	1.0	Mostly appropriate	0.8
20	Athena International Airport	On cost	0.8	On time	0.8	CL4	0.4	CL2	0.4	CL4	0.2	CL4	0.2	0.54	0.29	CL 2	0.6	Rather optimal financing	0.6	Full guarantee	1.0	Rather appropriate	0.6

21	Liefkenshoekspoorverbinding	On cost	0.8	Delay	0.0	CL1	1	CL2	0.6	CL2	0.4	CL1	0.8	0.65	0.68	CL 1	0.8	Mostly optimal financing	0.8	No guarantee	0.0	Mostly inappropriate	0.2
22	Metro de Malaga	Cost overrun	0.0	Delay	0.0	CL3	0.6	CL1	0.8	CL2	0.6	CL2	0.4	0.67	0.74	CL 1	0.8	Mostly not optimal financing	0.2	Partial guarantee	0.8	Rather inappropriate	0.4
23	M25 Motorway Orbital	On cost	0.8	Delay	0.0	CL1	1	CL1	0.8	CL4	0.2	CL1	0.8	0.62	0.57	CL 1	0.8	Rather optimal financing	0.6	No guarantee	0.0	Mostly appropriate	0.8
24	Moreas Motorway	Cost overrun	0.0	Delay	0.0	CL3	0.6	CL2	0.4	CL2	0.6	CL4	0.2	0.51	0.21	CL 4	0.2	Mostly not optimal financing	0.2	Full guarantee	1.0	Rather appropriate	0.6
25	Larnaca Ports & Marina Dev	On cost	0.8	On time	0.8	CL6	0	CL4	0.2	CL4	0.2	CL4	0.2	0.54	0.29	CL 3	0.4	Rather optimal financing	0.6	Full guarantee	1.0	Rather appropriate	0.6
26	Larnaca International Airport	On cost	0.8	On time	0.8	CL6	0	CL4	0.2	CL4	0.2	CL4	0.2	0.62	0.57	CL 3	0.4	Rather not optimal	0.4	Full guarantee	1.0	Rather inappropriate	0.4
27	SEVICI	On cost	0.8	On time	0.8	CL3	0.6	CL1	0.8	CL2	0.6	CL4	0.2	0.70	0.82	CL 2	0.6	Mostly optimal financing	0.8	No guarantee	0.0	Rather inappropriate	0.4
28	Fertagus	Cost Underrun	1,0	Delay	0.0	CL5	0.2	CL4	0.2	CL2	0.6	CL2	0.4	0.56	0.35	CL 1	0.8	Mostly not optimal financing	0.2	Partial guarantee	0.8	Rather inappropriate	0.4
29	E18 Muurla Lohja	On cost	0.8	On time	0.8	CL6	0	CL4	0.2	CL4	0.2	CL4	0.2	0.77	0.93	CL 1	0.8	Rather optimal financing	0.6	Partial guarantee	0.8	Rather appropriate	0.6
30	Lusoponte Bridge	On cost	0.8	On time	0.8	CL5	0.2	CL4	0.2	CL2	0.6	CL2	0.4	0.49	0.16	CL 1	0.8	Rather optimal financing	0.6	Partial guarantee	0.8	Rather inappropriate	0.4
31	Via Invest Zaventem	Cost underrun	1.0	Ahead schedule	1.0	CL1	1	CL1	0.8	CL2	0.4	CL1	0.8	0.66	0.71	CL 1	0.8	Mostly not optimal financing	0.2	No guarantee	0.0	Mostly appropriate	0.8
32	Deurgancklock dock	On cost	0.8	On time	0.8	CL1	1	CL2	0.6	CL2	0.4	CL1	0.8	0.62	0.57	CL 1	0.8	Rather optimal financing	0.6	Partial guarantee	0.8	Rather inappropriate	0.4
33	Metro sul do Tejo	On cost	0.8	On time	0.8	CL5	0.2	CL4	0.2	CL2	0.6	CL2	0.4	0.58	0.43	CL 3	0.4	The least optimal financing	0.0	Partial guarantee	0.8	Mostly appropriate	0.8
34	C-16 Terrasa-Manresa	Cost overrun	0.0	On time	0.8	CL4	0.4	CL2	0.6	CL4	0.2	CL4	0.2	0.64	0.65	CL 2	0.6	Rather not optimal	0.4	Partial guarantee	0.8	Rather inappropriate	0.4
35	Terminal Muelle Costa	On cost	0.8	On time	0.8	CL3	0.6	CL1	0.8	CL2	0.6	CL2	0.4	0.52	0.23	CL 4	0.2	Rather optimal financing	0.6	Partial guarantee	0.8	Rather inappropriate	0.4
36	Barcelona Europe Terminal	Cost overrun	0.0	Delay	0.0	CL3	0.6	CL1	0.8	CL2	0.6	CL2	0.4	0.61	0.54	CL 2	0.6	The least optimal financing	0.0	Partial guarantee	0.8	Rather appropriate	0.6
37	Depot City Pilsen	On cost	0.8	Ahead schedule	1.0	CL4	0.4	CL2	0.6	CL4	0.2	CL2	0.4	0.65	0.68	CL 1	0.8	Rather optimal financing	0.6	No guarantee	0.0	Rather inappropriate	0.4

Annex K.

Table K.1: Necessary conditions for project being 'on cost' and 'on time'

Conditions	Outcome: 'on cost'		Outcome: 'on time'	
	Presence	**Absence**	**Presence**	**Absence**
High levels of country competitiveness	0.62 (0.66)	0.58 (0.54)	0.66 (0.71)	0.54 (0.50)
Low levels of country competitiveness	0.57 (0.61)	0.64 (0.59)	0.54 (0.57)	0.69 (0.64)
High levels of PPP GSI	0.55 (0.57)	0.59 (0.54)	0.54 (0.56)	0.63 (0.57)
Low levels of PPP GSI	0.56 (0.61)	0.52 (0.50)	0.59 (0.64)	0.51 (0.49)
High quality of tendering process	0.70 (0.64)	0.71 (0.56)	0.69 (0.62)	0.72 (0.57)
Low quality of tendering process	0.52 (0.67)	0.53 (0.61)	0.53 (0.68)	0.52 (0.59)
More optimal financing scheme	0.57 (0.75)	0.44 (0.51)	0.59 (0.77)	0.42 (0.48)
Less optimal financing scheme	0.63 (0.56)	0.78 (0.61)	0.61 (0.55)	0.80 (0.63)
More appropriate risk allocation	0.61 (0.62)	0.66 (0.59)	0.61 (0.62)	0.66 (0.59)
Less appropriate risk allocation	0.60 (0.67)	0.57 (0.56)	0.60 (0.67)	0.57 (0.56)
More government guarantees	0.61 (0.56)	0.66 (0.53)	0.70 (0.64)	0.59 (0.47)
Less government guarantees	0.48 (0.62)	0.44 (0.49)	0.42 (0.55)	0.55 (0.61)
High levels of PPP-enhancing policies	0.58 (0.61)	0.67 (0.62)	0.59 (0.62)	0.67 (0.61)
Low levels of PPP-enhancing policies	0.64 (0.69)	0.57 (0.54)	0.63 (0.68)	0.58 (0.55)
High levels of PPP-specific regulations	0.45 (0.56)	0.65 (0.70)	0.46 (0.58)	0.64 (0.59)
Low levels of PPP-specific regulations	0.76 (0.71)	0.59 (0.49)	0.75 (0.70)	0.60 (0.50)
High levels of PPP-supporting arrangements	0.55 (0.70)	0.51 (0.57)	0.54 (0.69)	0.52 (0.58)
Low levels of PPP-supporting arrangements	0.67 (0.61)	0.73 (0.58)	0.68 (0.62)	0.72 (0.57)

*) necessary condition at level 0.90

ANNEX L.1. Truth table on-cost (analysis 1)

POSITIVE OUTCOME

COMP	PPP	TEND	GUA	FIN	RISK	OUT	n	incl	PRI	cases
1	1	0	0	1	0	1	2	0.819	0.662	7,8
1	1	0	0	1	1	1	1	0.819	0.635	6
1	1	1	0	1	1	1	1	0.778	0.550	23
0	0	0	1	1	0	1	1	0.778	0.627	10
0	0	0	1	1	1	1	1	0.778	0.627	25
0	0	1	1	1	1	1	1	0.778	0.627	20
1	0	1	1	1	1	1	1	0.777	0.605	29
1	1	1	0	1	0	1	3	0.754	0.560	13,21,27
0	0	1	1	1	0	1	1	0.752	0.593	30
1	1	1	0	0	1	0	1	0.742	0.498	31
0	1	1	0	0	1	0	1	0.733	0.468	3
0	1	0	1	1	0	0	1	0.676	0.465	35
1	0	1	0	1	0	0	1	0.663	0.435	37
0	0	1	1	0	0	0	2	0.636	0.492	16,28
0	0	0	1	0	0	0	2	0.621	0.465	1,14
1	1	1	1	1	0	0	1	0.613	0.381	32
1	0	0	1	0	0	0	2	0.612	0.400	15,26
1	1	1	1	1	1	0	2	0.608	0.389	9,19
1	0	1	1	0	0	0	2	0.602	0.423	17,34
0	0	0	1	0	1	0	1	0.586	0.428	33
0	0	0	0	1	1	0	1	0.517	0.200	2
1	1	1	1	0	1	0	1	0.513	0.286	36
0	0	1	0	0	1	0	1	0.503	0.231	4
0	1	0	1	0	1	0	1	0.471	0.241	24
0	1	1	1	0	1	0	2	0.465	0.253	5,18
1	1	1	1	0	0	0	3	0.421	0.208	11,12,22

Cut-off consistency ratio 0,752. No non-essential Prime Implicant

Note: Using R-software 3.1.6 yields the same results

This cut-off is still appropriate to analyse in QCA. We have conducted all prossible cut off consistency ratio by setting up higher 0,75. However, all values give us the non-essential prime implicant which some of them are very complex. Therefore, we did the analysis using cut-off consistency ratio 0,75.

NEGATIVE OUTCOME

COMP	PPP	TEND	GUA	FIN	RISK	OUT	n	incl	PRI	cases
0	0	0	0	1	1	1	1	0.879	0.800	2
0	0	1	0	0	1	1	1	0.851	0.769	4
1	1	1	1	0	0	1	3	0.848	0.792	11,12,22
0	1	0	1	0	1	1	1	0.832	0.759	24
0	1	1	1	0	1	1	2	0.819	0.747	5,18
1	1	1	1	0	1	1	1	0.805	0.714	36
0	1	1	0	0	1	0	1	0.765	0.532	3
1	1	1	1	1	0	0	1	0.762	0.619	32
1	1	1	1	1	1	0	2	0.750	0.611	9,19
1	1	1	0	0	1	0	1	0.744	0.502	31

1	0	0	1	0	0	0	2	0.741	0.600	15,26
1	0	1	0	1	0	0	1	0.741	0.565	37
1	1	1	0	1	1	0	1	0.729	0.450	23
0	1	0	1	1	0	0	1	0.718	0.535	35
1	0	1	1	0	0	0	2	0.709	0.577	17,34
0	0	0	1	0	1	0	1	0.690	0.572	33
1	1	1	0	1	0	0	3	0.687	0.440	13,21,27
1	1	0	0	1	1	0	1	0.685	0.365	6
0	0	0	1	0	0	0	2	0.671	0.535	1,14
1	0	1	1	1	1	0	1	0.659	0.395	29
0	0	1	1	0	0	0	2	0.648	0.508	16,28
1	1	0	0	1	0	0	2	0.646	0.338	7,8
0	0	1	1	1	0	0	1	0.639	0.407	30
0	0	0	1	1	0	0	1	0.626	0.373	10
0	0	0	1	1	1	0	1	0.626	0.373	25
0	0	1	1	1	1	0	1	0.626	0.373	20

Cut-off consistency ratio 0,805

Unfortunately, we found two non essential prime implicants ('model ambiguity') (Baumgartner & Thiem, 2017) being PI 1: ~COMP ~PPP ~GUA and PI II: ~PPP ~GUA RISK. As suggested by Legewie (2013) (see also User's Guide fsQCA by Ragin & Robinson, 2017), we select the prime implicant based on our substantive and theoretical knowledge which is PI 1. Then two parsimonious solutions arised, being PPP*GUA*~FIN and ~COMP*~PPP*~GUA with as intermediate solutions PPP*GUA*~FIN + ~COMP*~PPP*~GUA*~FIN + ~COMP*~PPP*~TEND*~GUA → ~On cost. As suggested by Baumgartner & Thiem (2017), we have further performed analyses by increasing and lowering the cut-off consistency ratio. Thus, we can conclude that this is the best model for explaining projects being over budget.

Note: Using R-software 3.1.6 yields the same results

Annex L.2. Truth table on-time (analysis 1)

POSITIVE OUTCOME

COMP	PPP	TEND	GUA	FIN	RISK	OUT	n	incl	PRI	cases
1	0	1	1	1	1	1	1	0.822	0.624	29
1	1	1	1	1	1	1	2	0.817	0.667	9,19
0	0	0	1	1	0	1	1	0.813	0.628	10
0	0	0	1	1	1	1	1	0.813	0.628	25
0	0	1	1	1	1	1	1	0.813	0.628	20
0	0	1	1	1	0	1	1	0.786	0.587	30
1	1	0	0	1	0	1	2	0.780	0.588	7,8
1	1	0	0	1	1	1	1	0.780	0.556	6
0	1	0	1	1	0	1	1	0.775	0.543	35
1	0	1	0	1	0	0	1	0.767	0.526	37
1	1	1	1	1	0	0	1	0.724	0.462	32
1	1	1	0	1	1	0	1	0.705	0.402	23
1	1	1	0	1	0	0	3	0.701	0.467	13,21,27
1	0	0	1	0	0	0	2	0.700	0.454	15,26
1	1	1	0	0	1	0	1	0.690	0.378	31
1	0	1	1	0	0	0	2	0.689	0.483	17,34
0	0	1	1	0	0	0	2	0.687	0.502	16,28
0	0	0	1	0	0	0	2	0.645	0.425	1,14
0	0	0	1	0	1	0	1	0.629	0.418	33
1	1	1	1	0	1	0	1	0.621	0.340	36
0	1	1	0	0	1	0	1	0.599	0.203	3
0	0	0	0	1	1	0	1	0.577	0.125	2
0	1	0	1	0	1	0	1	0.563	0.268	24
0	1	1	1	0	1	0	2	0.552	0.279	5,18
1	1	1	1	0	0	0	3	0.524	0.242	11,12,22
0	0	1	0	0	1	0	1	0.503	0.118	4

Cut-off consistency ratio 0,775 (see explanation in C.1)

Two non-essential prime implicants are PI 1: PI 1: ~COMP FIN ~RISK and PI 2: PI 2: ~COM GUA FIN. The prime implicant selected based on our substantive and theoretical knowledge is PI 2, which produces three parsimonious solutions PPP*~TEND*FIN; GUA*FIN*RISK and ~COMP*GUA*FIN with intermediate solutions ~COMP*GUA*FIN + COMP*PPP*~TEND*FIN + TEND*GUA*FIN*RISK → ~On Time. We have further increased and lowered the cut-off consistency ratio. Thus, we can conclude that this is the best model for explaining projects being over time.

Note: Using R-software 3.1.6 yields the same results

NEGATIVE OUTCOME

COMP	PPP	TEND	GUA	FIN	RISK	OUT	n	incl	PRI	cases
0	0	0	0	1	1	1	1	0.940	0.875	2
0	0	1	0	0	1	1	1	0.934	0.882	4
0	1	1	0	0	1	1	1	0.898	0.797	3
1	1	1	1	0	0	0	3	0.848	0.758	11,12,22
0	1	0	1	0	1	0	1	0.840	0.732	24
0	1	1	1	0	1	0	2	0.826	0.721	5,18
1	1	1	0	0	1	0	1	0.812	0.622	31
1	1	1	1	0	1	0	1	0.805	0.660	36
1	1	1	0	1	1	0	1	0.802	0.598	23
1	1	1	1	1	0	0	1	0.762	0.538	32
1	0	0	1	0	0	0	2	0.751	0.546	15,26
1	0	1	0	1	0	0	1	0.741	0.474	37
1	1	1	0	1	0	0	3	0.739	0.533	13,21,27
0	0	0	1	0	0	0	2	0.738	0.575	1,14
0	0	0	1	0	1	0	1	0.733	0.582	33
0	1	0	1	1	0	0	1	0.732	0.457	35
1	1	0	0	1	1	0	1	0.724	0.444	6
1	0	1	1	0	0	0	2	0.709	0.517	17,34
1	0	1	1	1	1	0	1	0.704	0.376	29
0	0	1	1	1	0	0	1	0.695	0.413	30
1	1	0	0	1	0	0	2	0.685	0.412	7,8
0	0	1	1	1	1	0	1	0.685	0.372	20
0	0	0	1	1	0	0	1	0.685	0.372	10
0	0	0	1	1	1	0	1	0.685	0.372	25
0	0	1	1	0	0	0	2	0.684	0.498	16,28
1	1	1	1	1	1	0	2	0.633	0.333	9,19

Cut-off consistency ratio 0,89

No non-essential Prime Implicant

Note: Using R-software 3.1.6 yields the same results

Annex L.3. Truth table on-cost (analysis 2)

POSITIVE OUTCOME

COMP	POL	SUPP	GUA	FIN	RISK	OUT	n	incl	PRI	cases
1	1	1	0	1	0	1	3	0.818	0.667	7,8,21
1	1	1	0	1	1	1	2	0.818	0.642	6,23
0	0	0	1	1	1	1	2	0.774	0.610	20,25
0	0	0	1	1	0	1	2	0.764	0.610	10,30
1	0	0	1	1	1	1	1	0.764	0.560	29
1	1	1	0	0	1	1	1	0.760	0.554	31
1	1	0	0	1	0	0	3	0.744	0.516	13,27,37
1	1	1	1	1	0	0	1	0.712	0.400	32
1	0	0	1	0	0	0	2	0.709	0.554	17,26
1	1	1	1	1	1	0	2	0.708	0.424	9,19
0	1	0	1	1	0	0	1	0.693	0.435	35
0	0	0	1	0	0	0	4	0.685	0.558	1,14,16,28
0	1	0	0	1	1	0	1	0.668	0.316	2
0	0	0	0	0	1	0	2	0.638	0.318	3,4
1	0	1	1	0	0	0	1	0.626	0.367	15
0	0	0	1	0	1	0	4	0.594	0.434	5,18,24,33
1	1	0	1	0	1	0	1	0.561	0.251	36
1	1	0	1	0	0	0	4	0.462	0.166	11,12,22,34

Cut-off consistency ratio 0,760 (see explanation in ANNEX C.1)

No non-essential Prime Implicant

Note: Using R-software 3.1.6 yields the same results

NEGATIVE OUTCOME

COMP	POL	SUPP	GUA	FIN	RISK	OUT	n	incl	PRI	cases
1	1	0	1	0	0	1	4	0.893	0.834	11,12,22,34
1	1	0	1	0	1	1	1	0.853	0.749	36
0	1	0	0	1	1	1	1	0.846	0.684	2
0	0	0	0	0	1	0	2	0.831	0.682	3,4
1	1	1	1	1	0	0	1	0.808	0.600	32
1	1	1	1	1	1	0	2	0.785	0.576	9,19
1	0	1	1	0	0	0	1	0.783	0.633	15
0	1	0	1	1	0	0	1	0.764	0.565	35
1	1	0	0	1	0	0	3	0.727	0.484	13,27,37
1	1	1	0	0	1	0	1	0.702	0.446	31
1	0	0	1	1	1	0	1	0.699	0.440	29
0	0	0	1	0	1	0	4	0.688	0.566	5,18,24,33
1	1	1	0	1	1	0	2	0.673	0.358	6,23
0	0	0	1	1	1	0	2	0.646	0.390	20,25
1	0	0	1	0	0	0	2	0.639	0.446	17,26
1	1	1	0	1	0	0	3	0.637	0.333	7,8,21
0	0	0	1	1	0	0	2	0.631	0.390	10,30
0	0	0	1	0	0	0	4	0.601	0.442	1,14,16,28

Cut-off consistency ratio 0,846

We found three non essential prime implicants ('model ambiguity') (Baumgartner & Thiem, 2017) being PI 1:POL~SUPP ~FIN; PI 2: POL GUA ~FIN and P3: COMP POL ~SUPP GUA. As suggested by Legewie (2013) (see also User's Guide fs QCA by Ragin & Robinson, 2017), we select the prime implicant based on our substantive and theoretical knowledge which is PI 1. Two parsimonious solutions are produced: POL*~SUPP*RISK and POL*~SUPP*~FIN with intermediate solution POL*~SUPP*~FIN + ~COMP*POL*~SUPP*~GUA*RISK→ ~On cost. As suggested by Baumgartner & Thiem (2017), we have further performed analyses by increasing and lowering the cut-off consistency ratio. Thus, we can conclude that this is the best model for explaining projects being over budget.

Note: Using R-software 3.1.6 yields the same results

Annex L.4. Truth table on-time (analysis 2)

POSITIVE OUTCOME

COMP	POL	SUPP	GUA	FIN	RISK	OUT	n	incl	PRI	cases
1	0	0	1	1	1	1	1	0.843	0.657	29
0	0	0	1	1	1	1	2	0.843	0.686	20,25
0	0	0	1	1	0	1	2	0.836	0.686	10,30
1	1	1	1	1	1	1	2	0.833	0.606	9,19
1	1	0	0	1	0	0	3	0.778	0.581	13,27,37
0	1	0	1	1	0	0	1	0.775	0.500	35
1	1	1	1	1	0	0	1	0.760	0.375	32
1	0	0	1	0	0	0	2	0.760	0.573	17,26
1	0	1	1	0	0	0	1	0.730	0.445	15
1	1	1	0	1	1	0	2	0.723	0.456	6,23
1	1	1	0	1	0	0	3	0.719	0.485	7,8,21
1	1	1	0	0	1	0	1	0.716	0.460	31
0	0	0	1	0	0	0	4	0.713	0.547	1,14,16,28
1	1	0	1	0	1	0	1	0.659	0.301	36
0	1	0	0	1	1	0	1	0.658	0.297	2
0	0	0	1	0	1	0	4	0.636	0.436	5,18,24,33
1	1	0	1	0	0	0	4	0.583	0.247	11,12,22,34
0	0	0	0	0	1	0	2	0.548	0.148	3,4

Cut-off consistency ratio 0,833

During the minimization process, we found two non-essential prime implicants ('model ambiguity') (Baumgartner & Thiem, 2017) which are PI 1: SUPP GUA RISK and PI 2: GUA FIN RISK. . As suggested by Legewie (2013) (see also User's Guide fs QCA by Ragin & Robinson, 2017), we select the prime implicant based on our substantive and theoretical knowledge which is PI 2. Two parsimonious solutions arised: ~POL*FIN and GUA*FIN*RISK, and they produced intermediate solutions ~POL*GUA*FIN + GUA*FIN*RISK → ON TIME. As suggested by Baumgartner & Thiem (2017), we have further performed analyses by increasing and lowereing the cut-off consistency ratio. Thus, we can conclude that this is the best model for explaining projects delivery on time. We do not select PI 1, because our results above (see analysis 1) show that a more optimal financing scheme is the most significant factor for explaining on time outcome. Also, taking into account PI 2 gives us more significant results in terms of consistency and coverage ratio.

Note: However, when using R-software 3.1.6 there is no non-essential prime implicant, and the results of using R316 show the same as with fsQCA 3.1 for selecting P2 (GUA FIN RIKS).

NEGATIVE OUTCOME

COMP	POL	SUPP	GUA	FIN	RISK	OUT	n	incl	PRI	cases
0	0	0	0	0	1	1	2	0.922	0.852	3,4
1	1	0	1	0	0	0	4	0.863	0.753	11,12,22,34
0	1	0	0	1	1	0	1	0.856	0.703	2
1	1	1	1	1	0	0	1	0.856	0.625	32
1	1	0	1	0	1	0	1	0.853	0.699	36
1	0	1	1	0	0	0	1	0.783	0.555	15
0	1	0	1	1	0	0	1	0.775	0.500	35
1	1	1	0	1	1	0	2	0.768	0.544	6,23
1	1	1	0	0	1	0	1	0.758	0.540	31
1	1	1	1	1	1	0	2	0.743	0.394	9,19
1	1	1	0	1	0	0	3	0.736	0.515	7,8,21
0	0	0	1	0	1	0	4	0.719	0.564	5,18,24,33
1	0	0	1	1	1	0	1	0.699	0.343	29
1	1	0	0	1	0	0	3	0.693	0.419	13,27,37
1	0	0	1	0	0	0	2	0.677	0.427	17,26
0	0	0	1	1	1	0	2	0.656	0.314	20,25
0	0	0	1	0	0	0	4	0.654	0.453	1,14,16,28
0	0	0	1	1	0	0	2	0.641	0.314	10,30

Cut-off consistency ratio 0,921

Unfortunately, we found three non essential prime implicants ('model ambiguity') (Baumgartner & Thiem, 2017) which are PI 1; ~POL*~GUA; ~SUPP*~GUA*FIN and ~COMP*~GUA*~FIN. We select the prime implicant based on our substantive and theoretical knowledge which is PI 2, subsequently two parsimonious solutions arised ~SUPP*~GUA*~FIN with as intermediate solution: ~COMP*~POL*~SUPP*~GUA*~FIN→ ~ON TIME. As suggested by Baumgartner & Thiem (2017), we have further performed analyses by increasing and lowering the cut-off consistency ratio. Thus, we can conclude that this is the best model for explaining projects being over time. Interestingly, all PI yield the same intermediate solution.

Note: Using R-software 3.1.6 yields the same results

Annex M

Table M.1: Scoring of the factor 'quality of tendering process'

Definition	Indicators	Success Criteria	Score			
			1	2	3	4
The extent tendering process delineate fair, competition, transparency and efficiency	To what extent information about tendering process can be accessed easily by bidders (fair-non discriminative)	Open tendering information	Negotiation	Competitive Dialogue	Negotiation open call	Open bidding
	To what extent tendering process can provide highly competitiveness among bidders (competition)	At least 4 bidders	No bidder	1 - 3 bidders	4 – 5 bidders	More than 5 bidders
	To what extent tendering process has promoted well-informed for all bidders in order to meet the standard for each step from inviting bidders to the final decision for the winner (transparency)	More complex tendering procedure with transparent information and thus can strengthening proposals of all bidders[48]	No complex	Low	Intermediate	High
	Timeliness of tendering processes or time from tender notice to contract closure (efficiency-timeliness)	Less than 2 years	More than 5 years	2 – 5 years	1 –2 years	Less than 1 years

Developed by the author based on:

Indicators :(1) Kwak et al (2009), (2) Solino & de Santos (2010), (3) Liyanage & Villalba (2015), (4) Voordijk et al (2015). (5) Kumaraswamy & Zhang (2001), (6) Winch (2002) ; (7) EC (2003); (8) OECD (2012),; (9) EPEC (2012)

Success criteria : (1) Zhang (2004); (2) Qiao et al., 2011; (3) Dixon et al. 2005 (4) Li et al. 2005; (5) Liyanage & Villalba 2015; (6) Vordijk et al, 2015; (7) Dudkin & Valila 2005; (8) Estache et al 2008; (9) Roumboutsos & Sciancalepore, 2014; (10) The World Bank & PPFIA (2012); (11) Garvin, 2010; (12) Mahalingam 2010; (13) Dinar & Subramanian 1997; (14) Reeves et al. 2013; (15) Carbonara et al, 2015; (16) HM Treasury (2012); (17) Grimsey & Lewis, 2007.

[48] Complexity in procedure can be distinguished into three main types: (1) Low: one-step procedure (bidders offer the final technical and financial proposals together), which can be conducted through open tendering or negotiated procedures; (2) Intermediate: Two stages tendering in which the technical and financial proposals from bidders are evaluated separately by the procuring authority. Bidders offer first technical proposals based on general performance specifications, followed by financial proposals. Such procedure can be carried out using open tendering and negotiated-open tendering, and (3) High: Two stages tendering, similarly, but which it is tendered by-shortlisted-negotiation and open tendering. Direct tendering is a non-complex tendering process.

Annex N. Check the solution paths using process tracing

1) The analysis using the condition of governmental PPP support

The solution formula should be linked back to cases, preferably through graphical representation tools (Schneider & Wagemann, 2010; Goertz, 2006). By applying X-Y plots, the combined QCA method and process tracing is used to find either typical cases for analysis of causal mechanism or deviant cases for improvement of theory (Schneider & Rohlfing, 2013; Rohlfing & Schneider, 2013).

Typical Case versus Typical Case

The aims of comparing the typical cases are to build or test the hypotheses on causal mechanisms. According to Schneider & Rohlfing (2013), a comparison of multiple typical cases should follow the *principle of max-max difference* and span the maximum range of membership in the outcome and the term. However, these two typical cases should be a unique membership which means that the involved case belongs to one solution path. As illustrated in figure E.1a, we compare two typical cases[49] being Liefkenshoekspoorverbinding (0.68,0.8) and E18 Muurla-Lohja (0.6, 0.8) (see box 1). When Liefkenshoekspoorverbinding refers to configuration COMP*PPP*~GUA*FIN and E-18 Muurla-Lohja mentions the configuration ~PPP*GUA*FIN. We can do the factoring as: FIN*(COMP*PPP*~GUA + ~PPP*GUA). Thus, having an optimal financing scheme is a crucial condition for the projects being on cost.

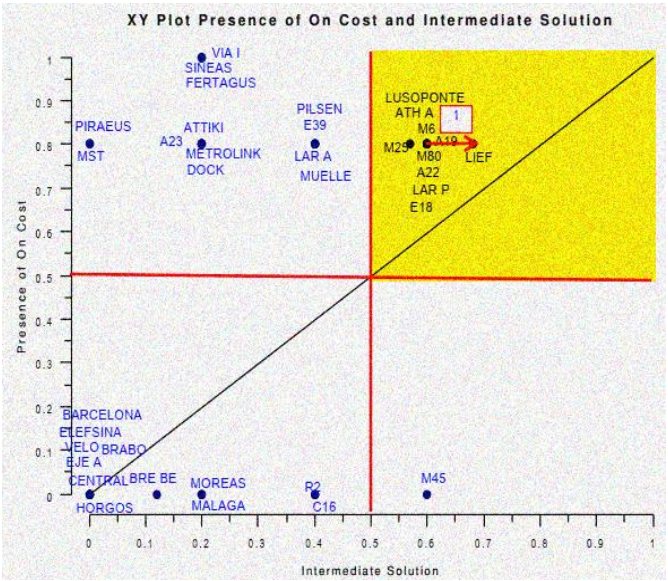

Figure N.1a: XY PLOT PRESENCE OF ON COST

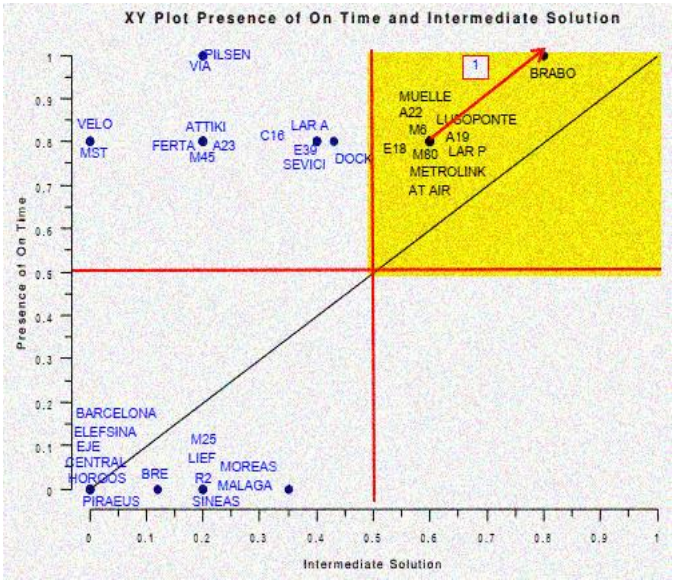

Figure N.1b: XY PLOT PRESENCE OF ON TIME

Concerning on-time projects, we compare two typical cases being Brabo 1 (0.71, 1.0) and A22 Algarve (0.6, 0.8) (see box 1). Whereas the configuration TEND*GUA*FIN*RISK mentions to Brabo 1, A22 motorway refers to the configuration ~COMP*GUA*FIN. By factoring, these combinations can be

[49] M25 motorway (0,57;0.8) is fullfiled the maxi-maxi. however, when compared to a single case being Liefkenshoekspoorverbinding (0.68,0.8), this can not be examined, because it belong to the same classification.

expressed into the formula GUA*FIN*(TEND*RISK + ~COMP). Thus, the on-time projects can mostly be explained by the combination of provided government guaratees and a more optimal and prudent financing scheme. Other conditions being the quality of tendering process, risk allocation and government guarantees are less important factors for explaining the on-time outcome.

2) The analysis using three dimensions of governmental PPP support as conditions

As to the 'on cost' outcome, the comparison can be conducted between two typical cases which are M-25 Motorway (0.57,0.8) and Via Invest Zaventem (0,71,1). The configuration expressing COMP*POL*SUPP*~GUA*FIN points M25 Motorway, and Via Invest Z can he illustrated by COMP*POL*SUPP*~GUA*RISK. The factorization of the combination of conditions delineate as follows: COMP*POL*SUPP*~GUA (RISK + FIN). It implies that the on cost outcome can be explained by high levels of country competitiveness together with a high level of PPP-enhancing policy and a high level PPP supporting arrangement, but without government guarantees.

As to the 'on time' outcome, using the *principle of max-max difference.* we compare two typical cases being Brabo 1 (0.8, 1.0) and E18 Muurla-Lohja (0.6, 0.8). Two configuration GUA*FIN*RISK and ~POL*GUA*FIN that can be factored as FIN*GUA* (RISK + ~POL). Thus, the combination of a more optimal financing scheme and having a guarantee can explain robustly the presence of on time.

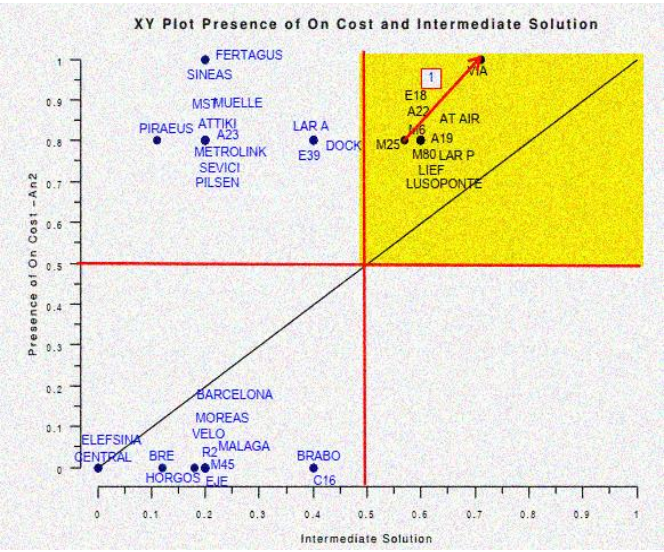

Figure N.2a: XY PLOT PRESENCE OF ON COST

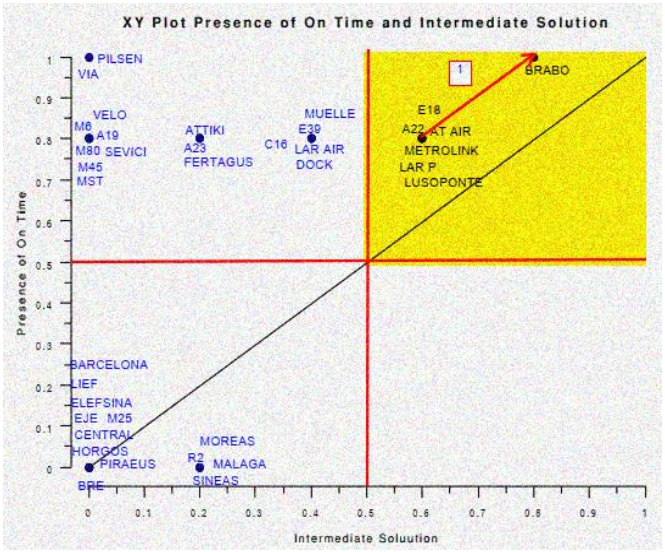

Figure N.2b: XY PLOT PRESENCE OF ON TIME

Annex O

Table O. 1 Contribution to literature explaining project success (on time & within budget)

Conditions	Detail success factors found in literature	Sources	Findings (confirmation with proposition)	
			On cost	On time
Result 1: governmental PPP support - in general				
Macro-institutional & economic (country competitiveness)	Macro-institutional: Political stability, regulatory quality, favourable legal framework, less corruption,	Hammami et al (2006); Galilea & Medda (2010); Percoco (2014); Osei-Kyei & Chan (2015); Moszoro (2010)	Confirmed, to some extent	Confirmed, but somewhat negated
	Macro-economic : the stability in macro-economic, high public debt, larger market size	Mota & Moreira (2015); Zagozdzon (2013); Osei-Kyei & Chan (2015)		
	Financial Conditions: availability of financial market	Chan et al (2010a),		
governmental PPP support	PPP-enhancing policies: political support, detail project pipeline/planning	Jacobson & Choi, (2008); Tam, (1994) ; Mladenovic et al (2013	Confirmed, but somewhat negated	Confirmed in less extent
	PPP-enabling regulations: appropriate legal regulation, sound legal and strong regulatory framework, guarantees provided by government	Zagozdzon (2013); Jamali (2004); Azis (2004); Tam, (1994); Liu (2013) ; Ng (2012)		
	PPP-supporting arrangements: PPP Unit, transparency in process, a good feasibility study, clear project brief and design development, standardization process and documents.	Zagozdzon (2013) ; Jamali (2004) ; Azis (2004) ; Mladenovic et al (2013) ; Jefferies (2002) ; Jacobson & Choi (2008) ; Tam (1994)		
Financing scheme	Financial capability of private sectors	Osei-Kyei & Chan (2015)	**Fully confirmed**	**Fully confirmed**
Tendering process	Transparent and competitive procurement process	Osei-Kyei & Chan (2015)	Negated, to some extent	Confirmed, but somewhat negated
Risk Allocation	Appropriate risk allocation	Mota & Moreira (2015); Chan et al. (2010a); Iossa et al (2007); Flyberg et al (2002)	Confirmed, to some extent	Confirmed, to a less extent
Guarantee	Government providing guarantee	Osei-Kyei & Chan (2015); Chan et al (2010a)	Confirmed, to some extent, but somewhat negated	Confirmed, to a high extent
Result 2: Dimensions of governmental PPP support				
PPP-enhancing Policies & political commitment	See above	See above	Confirmed, but somewhat negated	Negated, to some extent
PPP-supporting arrangements	See above	See above	Confirmed to a high extent	Absent

Annex O.1 presents the success factors found in literature and their relationships with our findings. However, this is not fully comparable. While the literature covers the definition of success in general as well as for infrastructure projects in general, this study focuses on the success of specifically PPP transport infrastructure projects in terms of on time and within budget.

Annex O.2: Contribution to literature explaining project failures (delayed & cost overrun)

Conditions	Detail failure factors found in literatures	Sources	Findings (Confirmation with proposition)	
			Cost Overrun	Delayed / over time
Result 1: governmental PPP support-in general				
Macro-institutional & economic (country competitiveness)	Macro-institutional: bureaucratic indecision, uncertainty political issues, unconducive regulatory environments	Chan et al (2010b); Shibani & Amurugam (2015); Yang et al (2010)	Confirmed, to a high extent	**Fully confirmed**
	Macro-economic: the instability macro-economic, currency devaluation, price fluctuation, rises in interest rates	Kaliba et al (2009); Foucacre et al (1990); Shibani & Amurugam (2015); Yang et al (2010); Chan & Park (2005); Nida et al (2008); Mansfield (1994)		
	Financial conditions: non-conducive financial market	Chan et al. (2010b); Yang et al (2010)		
Governmental PPP support	PPP-enhancing policies & political commitment: inappropriate government policies, risks of optimism biases in project selection, poor project design.	Chan & Park (2005);); Chan et al. (2010b)	Confirmed, to a high extent, but somewhat negated	Confirmed, to a lesser extent
	PPP-enabling regulations: lack of well-established legal framework	Chan et al (2010b)		
	PPP-supporting arrangements: Low institutional PPP capacity, inappropriate organizational structure of public sectors, improper contract planning, longer negotiations of signing contract	Estache & Saussier (2014); Morris (1990); Yang at al. (2010)		
Financing scheme	Poor project financing, problem in financing and project payment, wrong method of cost estimation, debt problems	Flyberg et al (2003); Chan & Park (2005); Nida et al (2008); Morris (1990)Odeck (2004); (Doloi et al (2013); Mansfield (1994)	Confirmed, to a high extent	Confirmed, to a lesser extent
Tendering process	High transaction cost and lengthy lead time	Chan et al. (2010b); Nida et al. (2008)	Confirmed, to a lesser extent	Confirmed, to a lesser extent
Risk Allocation	Misallocation of risk, cost of unforeseen service and utility, unforeseen ground condition, equipment in-availability, change of work, force majeure	Chan et al (2010)b; Chan & Park (2005); Kaliba et al (2009); Nijkamp & Ubbels (1999); Odeck (2004)	Absent	Absent
Guarantee	Not already shown in literatures		Confirmed, to a high extent, but somewhat negated	**Fully confirmed**
Result 2: Dimensions of governmental PPP support				

PPP-enhancing Policies & political commitment	See above	See above	Fully negated	Confirmed
PPP-supporting arrangements	See above	See above	**Fully confirmed**	Confirmed

Annex O.2 presents the failure factors found in literature and their relationships with our findings. The failure factors can be compared and be linked to the literature rather straightforwardly in terms of having cost overruns as well as being delayed.

About the author

Raden Murwantara was born on January 14, 1971 in Bantul, Indonesia. He completed his Bachelor Degree in Accounting at The State College of Accountancy, The Ministry of Finance Republic of Indonesia in 1992 (junior accountant) and 1998 (accountant). He also obtained Bachelor Degree in Management from Open University of Indonesia in 1998. He completed his master degree in Economic Development (M.Ec. Dev.) with predicate cumlaude at Gadjah Mada University, Indonesia in 2009. He has worked as a government auditor at the Financial and Development Supervisory Board of the Republic of Indonesia (Badan Pengawasan Keuangan dan Pembangunan – BPKP) since 1992 or more than 30 years. His experience is heavily involved in duties as an auditor and a consultant of public sector as well as state owned enterprises in performing good governance, accounting, performance management, standard operating procedures, risk management, public procurement and so on. Before continuing his PhD program, he served as a senior auditor at the BPKP in The Deputy of Economic Affairs Supervisory. In January 2013, he started his PhD trajectory at the Research Group of Public Administration and Management, Faculty of Social Sciences, University of Antwerp, Belgium funded by *the Scholarship Program for Strengthening the Reforming Institution* (SPIRIT) BAPPENAS. After he has served as a Chief Representation Office of the Financial and Development Supervisory Board of the Republic of Indonesia, Gorontalo for two years, he is now a Director of Financial and Economic Supervisory at the same institution.

Note on contributors to chapters

This dissertation adheres to faculty regulations and common practices on the role performed by doctoral researchers in writing their dissertation. Article 19 of the additional doctoral regulation of 29-08-2018 requires that a table in an appendix on the doctoral student's contribution to each paper is included in the dissertation. These chapters were included in the dissertation as they (1) all featured a substantial contribution of the doctoral student and (2) form a coherent whole with the first- and single-authored chapters. The inclusion of these chapters is in conformance with the faculty common practice as these chapters are in excess of the minimal amount of first-authored and single-authored chapters.

Additional Information on Authors' Contributions to the various chapters

Chapter titles	Contribution of author
Chapter 1: Introduction	Single-authored
Chapter 2: How do governments support the development of Public-Private Partnerships? Measuring and comparing PPP governmental Support in 20 European Countries (Published in Verhoest, K., Petersen, O. H., Scherrer, W. & Soecipto, R. M. (2015). 'How do governments support the development of Public Private Partnerships? Measuring and comparing governmental PPP support across 20 European countries. *Transport Reviews*, 35 (2), 118-139)	Author 1: Koen Verhoest (supervisor): introduction and idea, coordination, methodology, data gathering (Cost Action TU1001), analysis, theoretical framework, conclusion, revision, and reviewer responses Author 2: Ole Helby Petersen: theoretical framework, data gathering (COST Action TU1001), data cleaning, analysis, reviewer responses. Author 3: Walter Scherrer: theoretical framework, data gathering (Cost Action TU1001), data cleaning, analysis, reviewer responses Author 4: Raden Murwantara Soecipto: introduction, collecting, updating and validating data country template, methodology, theoretical framework, analysis, conclusion, revision and reviewer responses
Chapter 3: Diverging and converging PPP Policies, regulations and supporting arrangements? A comparative analysis of twenty European countries (Published in Soecipto, R..Murwantara., Verhoest, K.., Petersen, O.H., Scherrer, W. (2016). Diverging or converging PPP policies, regulations and supporting arrangements? A comparative cluster	Author 1: Raden Murwantara Soecipto: Introduction and idea, methodology, theoretical framework, data cleaning, quantitative and qualitative analysis, conclusion, reviewer responses Author 2: Koen Verhoest (supervisor): contributing to coordination, methodology, theoretical framework, conclusion, reviewer responses Author 3: Ole Helby Petersen: contributing to theoretical framework, analysis, reviewer responses

analysis of twenty European countries. In Roumboutsos, A. (ed.) *Public-private partnership in transport – trends and theory*. Oxford: Routledge, 19-43)	Author 4: Walter Scherrer: contributing theoretical framework, analysis, reviewer responses
Chapter 4: Why do countries differ in terms of governmental support for public private partnerships (PPPs)? Explaining variations in PPP support in twenty European countries (Presented in International Conference in Public Policy (ICPP), Milan, Italy, 1st to 4th July, 2015).	Author 1: Raden Murwantara: introduction and idea, methodology, theoretical framework, data gathering, data cleaning, qualitative comparative analysis (QCA) analysis and interpretation, conclusion, presenting in ICPP conference 2015. Author 2: Koen Verhoest (supervisor): introduction, coordination, methodology, theoretical framework, analysis, intensive revision off all parts. Author 3: Ole Helby Petersen: contributing to theoretical framework, interpretation of results and discussion, presenting in ICPP conference 2015 together with author 1. Author 4: Walter Scherrer: contributing to theoretical framework, interpretation of results and discussion.
Chapter 5: Contract Stability in European road infrastructure PPPs: How does governmental PPP support contribute in preventing contract renegotiation? (Published in Soecipto, Raden Murwantara and Verhoest, Koen, (2018), Contract Stability in European road infrastructure PPPs: How does governmental PPP support contribute to preventing contract renegotiation? *Public Management Review*, Vol. 20 No 8, page 1145-1164, https://doi.org/10.1080/14719037.2018.1428414)	Author 1: Raden Murwantara: introduction and idea, methodology, theoretical framework, data gathering, data cleaning, qualitative comparative analysis (QCA) analysis and interpretation, conclusion, reviewer responses Author 2: Koen Verhoest (supervision): introduction, methodology, theoretical framework, data cleaning, data gathering, analysis, conclusion, intensive revision all parts, reviewer responses Author 1 and author 2 share an equal contribution in this chapter
Chapter 6: How government support can help to deliver PPP projects on time and within budget: a qualitative comparative analysis of Infrastructure Projects in different European Countries	Single-authored, all parts written, qualitative comparative analysis (QCA) and process tracing (PT) performed by Raden Murwantara. Reviewed and commented by supervisor

Chapter 7: Conclusion	Single-authored

LIST OF PUBLICATIONS

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1. Verhoest, K, Petersen, Ole H., Scherrer, W. & Soecipto, **Raden Murwantara** (2015). "How do governments support the development of public private partnerships? Measuring and comparing PPP governmental support in 20 European Countries", *Transport Reviews Journal* Vol. 35 No. 2. Taylor & Francis. **Impact factor 2018: 6,648**.
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1. Soecipto, Raden Murwantara, Verhoest, K., Scherrer, W, & Petersen, Ole H. (2015). "Chapter 2 Diverging and Converging PPP policies, regulations and supporting arrangements? A comparative analysis of twenty European countries". In Public Private Partnerships in Transport: Trends and Theory. Roumboutsos, A. (Eds). Routledge Book Series. Published 28 July 2015
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