

Evaluation of PPP Road Projects in Greece

Abstract

Purpose: The purpose of this paper is to explore and evaluate the problems encountered by five major road projects recently implemented in Greece as Public Private Partnerships (PPP) and make recommendations for improvement of the relevant managerial practices and contractual clauses for the benefit of similar future projects.

Design/methodology/approach: A qualitative approach was adopted in this research as only senior engineers with specific managerial experience were deemed suitable for the purposes of this research. Fifteen semi – structured interviews were conducted with CEOs of the PPPs and Heads of Independent Engineers involved in the projects' implementation as well as with senior officials of two Greek Ministries.

Findings –The experts identified different areas of weakness relevant to the revenue risks, the planning of the scope, the management of designs and legal permits as well as the toll policy selected. They also made specific recommendations for the streamlining of the relevant procedures in the future.

Practical Implications: The experts' opinions and recommendations constitute a solid basis for the achievement of higher efficiency in the management of future PPP projects worldwide.

Originality/value: This research offers a holistic perspective to PPP project management as it sheds light to the problems encountered by the Greek PPP programme as a whole and incorporates the experience gained at the contracts' renegotiation. The research draws from the experience of experts and offers recommendations for systemic improvements which can be widely applied in any geographical context.

Keywords: Concessions, Contracts, Greece, Motorways, PPP, Project Management, Risk

Research Paper

1. Introduction

A Public Private Partnership (PPP) can be described as any form of co-operation between contracting authorities and private sector economic operators, often with the aim of ensuring the funding, construction, renovation, management and maintenance of infrastructure (works) and/or the provision of a service. The participating organisations are often referred to as “partners”, which is a term generally used in a non-legal sense. A key feature of PPPs tends to be the sharing or transfer of risk to the private sector partner, and PPPs are often, but not always, of long duration (OECD 2011). PPPs have been widely used as an infrastructure delivery model by many governments, especially in the transport sector, where transportation capacity was needed to facilitate, support and respond to economic growth (Nikolaidis and Roumboutsos, 2013). Despite the accumulated experience however, numerous national PPP programs including those of Portugal, Spain, Greece, Hungary, Czech Republic, Poland, Croatia, Romania, Serbia, Bulgaria, Slovakia, Mexico, Colombia and Chile

ended with a significant gap between the expected outcomes and the actual results. Actually, the frequency of renegotiations appears to be beyond the expected or reasonable levels, raising serious questions about the viability of the concession model (Guasch *et al.*, 2008) and compromising the credibility of the countries involved (Guasch, 2004).

The majority of the aforementioned national PPP programmes in Europe and Latin America have attracted research interest in line with Guasch and Straub's (2006) view that it is crucial to develop a better understanding of the mechanisms enabling successful private participation in infrastructure. Nevertheless, the research theme of contract termination and renegotiation is still neglected in the literature, compared to other PPP relevant themes. This is a major gap for governments, and also for the private sector, that are now facing the difficulties of early termination of PPP contracts (de Castro *et al.*, 2016).

This paper is the first piece of research holistically evaluating the Greek PPP programme's implementation and renegotiation based on the experience of experts who were involved from key positions in both the private and the public sector. Specifically, this research sheds light to the causes behind the programme's costly derailment and makes recommendations for the improvement of the contractual and managerial practice in future PPP projects.

The remaining of the paper is structured as follows: in section 2, the background and context of the research are presented; in section 3, the research methodology is detailed; in section 4, the experts' opinions on the main areas of failure are summarised; in section 5, the experts' recommendations for avoidance of the relevant inefficiencies in the future are provided; section 6 includes the conclusions of the paper.

2. Background and research context

PPP is an evolving concept and such projects take many forms around the world, though in all cases they consist of the pursuit of public policy through a long term agreement between a public agency and a private sector partner. Crucially, a PPP involves the purchase of a stream of services defined in a detailed service agreement under specified terms and conditions (Koskela *et al.*, 2016). PPPs in infrastructure sector typically involve a concession contract which grants a private firm the right to operate an infrastructure service for a specified period and to receive revenues deriving from it (Guasch, 2004). Concession contracts are highly exposed to exogenous risks like traffic forecasts, stakeholder positions and macroeconomic factors, mainly due to their inherent nature of ex ante incompleteness (Nikolaidis and Roumboutsos, 2013; Macario *et al.*, 2015; Carbonara *et al.*, 2015; Guasch *et al.*, 2008). These can lead to contract renegotiation i.e. a major revision not envisioned in the original contract. Athias and Saussier (2018) note that when uncertainty is high, contract flexibility within a stable and efficient regulatory framework is crucial. Guasch (2004) provides a detailed

description of such a framework emphasising the need for the strongest possible legal grounding.

In the context of projects' failure and renegotiation, previous research devoted to the PPP programmes of Spain and Portugal (Vassallo *et al.*, 2012; de los Angeles Baeza and Vasallo, 2010; Cruz *et al.*, 2014; Cruz and Marques, 2013), Central Europe (Carpintero, 2010; Brenck *et al.*, 2005) and Latin America (Carpintero and Gomez-Ibanez, 2011; Carpintero and Barcham, 2012; Carpintero *et al.*, 2014; Guasch, 2004, Guasch and Straub, 2006; Guasch *et al.* 2008; Guasch and Straub, 2009), identifies an array of causes including aggressive bidding and opportunism, inadequate regulation, insufficient coordination of the government, political and financial instability, poor contractual design, erroneous cost estimation, optimism bias at the anticipated traffic level, delays and cost overruns in expropriations, high tolls and negative public reaction.

In Greece, the promotion of road concession projects was triggered in the '90s by the EU's initiative for the development of the Trans-European Network of Transport (TEN-T) and the subsequent endorsement of PPPs as a means to secure the financing of the projects. The first generation of PPP projects includes two road projects: The first one, 'Attiki Odos' is a 52 km-long urban motorway which with its 13km-long spur 'Hymettus Peripheral Road' connect together over 30 municipalities of Athens Metropolitan Area as well as the Athens International Airport with the main national highway Patras - Athens – Thessaloniki (PATHE) (Figure 1). The second project is the 2.8 km long Rion-Antirion suspended Bridge in the mouth of Corinthian Bay near Patras, which effectively connects the northern-west motorway 'Ionia Odos' and the southern 'Olympia Odos' (Figure 1).

Both projects were associated with the 2004 Athens Olympic Games; this ensured timely completion through an unusually streamlined implementation of all the processes controlled by the State (expropriations, environmental licensing etc). Furthermore, despite the financial crisis, both projects enjoy high public acceptance and satisfactory revenues (Villalba-Romero *et al.*, 2015; Liyanage and Villalba-Romero, 2015; Roumboutsos and Anagnostopoulos, 2008), as they improved tremendously the everyday transport experience of their users.

<Figure 1>

The success of the first generation projects led to the ambitious second generation which included five TEN-T motorways and an urban submerged tunnel in Thessaloniki. The tunnel project was terminated due to archaeological findings (Marinelli *et al.*, 2017) and the State was obliged to compensate the Concessionaire with the amount of €110 million. Therefore, further analysis will be limited to the motorway projects tendered in 2005 (Figure 1). In total, the five concession contracts included the construction of 742 km of new motorway, the upgrading of 522 km of existing national

roads to motorway standards and the operation of 1,404 km (including new sections constructed by the State) (Table 1).

<Table 1>

The construction activities commenced between December 2007 and March 2008 and had been planned to be completed by 2014 while the concession period was fixed at a 30-year period. The projects were subsidised by the State through the State Financial Contribution (SFC), the 65% of which was contributed by the EU. The Concessionaires were responsible for the financing of the construction beyond the SFC and the 30-year period of operation of the projects, including the relevant risks. They were also entitled to the collection of toll fees from the beginning of the construction period in existing motorway sections (cross subsidy), as well as on sections to upgrade. However, due to the unprecedented economic crisis in Greece, in 2010, the traffic volumes had collapsed. As a result, the Lending Banks temporarily withheld financing and requested the review of the financial models. Following the updated traffic volume forecasts which were 40% lower, the Lending Banks suspended the drawdown payments in late 2010/ early 2011 and construction activities were consequently suspended.

In early 2011, the Ministry for Infrastructure - General Secretariat for Concessions started negotiations with the Concessionaires, the Lending Banks and the European Commission. Following a long period of political instability, the renegotiated concession agreements were finalised and ratified by the Parliament in November 2013; these included substantial scope reduction, interest rates increase, additional SFC and claims remuneration of €1,100 million approximately. New claims were raised in the following years and additional remuneration of €500 million approximately was paid. The “transformed” projects were finally completed in 2017.

The success of PPP projects can be seen from three different perspectives: project management (time, cost and quality), stakeholders (public, private and user) and contract management (contract, process and results) (Liyanage and Villalba-Romero, 2015). Taking this approach, the second generation PPP projects in Greece undoubtedly failed as they experienced major delays, demanded extensive renegotiations and in many cases faced the local communities’ opposition. In this context, it is worth exploring the causes of the observed problems as well as the lessons learnt in light of improving the planning of future PPP projects.

3. Methodology

The qualitative research generally falls within the process of the scientific method which following the selection of the topic includes the examination of the literature, collection and analysis of data and presentation and discussion of results (Creswell, 2013).

3.1 Examination of the literature

In this research, a selective review of previous studies directly related to the topic of study, method and data source was conducted. Such a review enables the sharpening of the preliminary considerations (Yin, 2016) and identification of concepts which serve as background ideas offering frameworks through which researchers see, organise and experience the research problem (Taylor *et al.*, 2016). In addition, other documents (governmental reports, legislation, contractual documents) were reviewed to inform the interview questions and help document the importance of the research problem (Creswell, 2013).

3.2 Data collection

Data serve as the foundation for a research study. In qualitative research, the relevant data may come from four data collection methods: interviewing, observing, collecting and examining and feeling (Yin, 2016). Interviews are very common and provide opportunities for understanding, reflection, and explanation (Tracy, 2013).

Different interview “types” have been introduced by various scholars; they differ depending on the goals of the research, on the participants, on the researcher’s epistemological leanings, and on the structure of the interview (Tracy, 2013). This research is based on semi-structured interviews with knowledgeable interviewees selected to provide specific facts, descriptions of events or examples to answer a focused research question. This description typifies the category of topical interviews (Rubin and Rubin, 2012). The technique of semi – structured interviews gives participants time and opportunity to reconstruct their own experiences and reality in their own words (Yin, 2016). The interviews lasted from 40 to 80 minutes each and were carried out in December 2017 – January 2018 via telephone, as the geographical distance would not allow for face-to-face meetings. Mediated interviews present several strengths including cost-effectiveness, reduced coordination needs and increased engagement and sharing (Tracy, 2013).

For the identification of interviewees, the principle of purposeful sampling (Creswell, 2013) was used, i.e. individuals with high expertise and long experience in key managerial positions in the concessionaires and the supervisory public entities were selected as they could purposefully inform an understanding of the research problem. However a purposive sample is not necessarily a representative sample. The principle of maximum variation sampling suggests the selection of sources offering the broadest possible range of information (Yin, 2016). Towards this, interviewees representing both the private and the public sector and particularly all the five different PPP projects were selected. Regarding the total number of the interviews, the redundancy principle informed the final number, i.e. data collection was concluded when no genuinely new insights were forthcoming from additional instances and the responses of the interviewees were predictable (Yin, 2016; Taylor *et al.*, 2016; Tracy, 2013).

In the above context, the sample included 15 experts of high seniority (with more than 25 years professional experience in construction project management) who had held

key managerial positions in the Greek PPP projects throughout the period 2007 – 2017. Specifically,

- Four CEOs and one Technical Director representing the five Concessionaires.
- Two Heads of Independent Engineers (entity responsible for design checking and construction supervision) for two different concessions.
- The Director and a Deputy Director of the Managing Authority of the Ministry of Development, responsible for the financing of Concessions.
- From the Ministry of Infrastructure and Transport:
 - the Director General for Transport Infrastructure and two Directors of Managing Services responsible for road Concessions.
 - an ex-Director General, responsible for the First Generation of Road Concessions.
 - two ex-General Secretaries responsible for infrastructure projects who participated in the negotiations between the Greek State and EU for the concessions' restart.

The experts were identified and initially contacted through senior contacts in the professional and academic network of the researcher. This approach is endorsed by Taylor *et al.* (2016) who note that a researcher's personal contacts usually know a surprising number of different persons. As Rossman and Rallis (2012) and Tracy (2013) note, interviewing elites deserves special consideration; the interviewer should be knowledgeable about the topic and must establish competence projecting an accurate conceptualisation of the problem through shrewd questioning. For this purpose, a wide range of scientific and other sources of literature including the relevant concession agreements and other technical reports were thoroughly studied prior to the interviews.

Regarding the interview process, as per Tracy's (2013) suggestions, a brief introduction with the interview's purpose, length, topics covered and confidentiality assurance was first made. The main discussion was based on an interview guide, i.e. a list of general areas representing the researcher's mental framework to be covered with each informant (Taylor *et al.*, 2016; Yin, 2016). This included areas pointed in the literature as potentially influential for the projects' performance like risk and stakeholder management, design procurement, project financing, planning and scheduling, organisation and coordination. As Yin (2016) and Rubin and Rubin (2012) suggest, the interviewees' views were investigated in depth through open-ended questions, follow-up questions, clarification requests and probes for specific examples. The responses were audio recorded with the participants' consent and brief notes were also taken.

3.3 Data analysis

Data analysis in qualitative research consists of preparing and organising the data for analysis, then reducing the data into themes through a process of coding and condensing the codes into broader categories or themes and finally using the reassembled material to create a new narrative (Creswell, 2013; Yin, 2016). For instance, when asked for factors which contributed to the observed performance gaps of the PPP projects, the

interviewees repeatedly made explicit references to the incomplete land expropriations, the slowly progressing archaeological investigations, the cumbersome environmental licensing processes and the inadequate legislation. Following methodic organisation of the transcripts, these factors were isolated and combined so as to form a larger conceptual model, i.e. the theme of inefficient administrative procedures for the obtainment of various legal permits and consents. Working this way, i.e. inductively from particulars to more general perspectives, the five different themes constituting the skeleton of the new narrative emerged (financial crisis and traffic risk; project scope, planning and internal stakeholder coordination; legal permits and consents; design and external stakeholder management; toll policy). It is to be noted that each of the aforementioned five themes was highlighted as area of criticism and potential improvement by at least 12 out of the 15 interviewees while three themes (financial crisis and traffic risk; legal permits and consents; toll policy) were stressed by all the 15 participants. This effectively marks the fact that cognitive saturation was reached.

The persuasive credentials and first-hand experience of the interviewees and the implementation of the above framework, as previously described, provide assurance that, as per Rubin and Rubin (2012) and Yin (2016), the participants were appropriate, the data were properly collected and the findings accurately reflect what was studied. This demonstrates this research's credibility, trustworthiness and authenticity.

4. Results and Discussion

4.1 Financial crisis and traffic risk

According to the contracts, the traffic risk had been fully undertaken by the Concessionaires. In this context, during the period 2002-2003, the State conducted traffic studies for all the motorways to be constructed and allowed the prospective Concessionaires to access the primary data. After adapting these and conducting their own traffic counts, the bidders elaborated traffic forecasts and used them to calculate revenues in their bids. Most of the experts commented that these estimates reflected the over-optimism prevailing at that time for the growth perspectives of the Greek economy. The Lending Banks and each Concessionaire agreed a financial model which included a low case scenario based on traffic data reduced by 15% - 20% (MoT, 2011). However, as traffic demand and respective revenues are vulnerable to macro-economic impacts (Roumboutsos and Pantelias, 2015), by 2011 the financial and credit crisis resulted in unprecedented reduction of the traffic volume, reaching up to 55% in some toll stations (MoT, 2011). Eventually, the Greek State had to undertake the traffic risk and compensate the Concessionaires accordingly, on the ground that the financial crisis of this extent was equivalent to a long-lasting force majeure event. The above confirm the observation by Guasch and Straub (2009) that renegotiations are often a way for firms and governments to socialise losses, while gains are kept private. Similarly destructive impact of traffic risk has also been highlighted in the literature for the PPP projects in Spain, Portugal, Poland, Czech Republic, Romania and Bulgaria, Chile and Mexico.

All the experts agreed that the financial crisis had tremendous impact on the course of the projects and its massive and destructive consequences were beyond the realm of the cost-benefit analyses, traffic forecast studies and financial models prepared before the concessions' award. However, the experts also unanimously agreed that there were other areas of failure, beyond the unpredictable financial crisis, which require radical improvement before any other PPP projects are launched.

4.2 Project scope, planning and internal stakeholder coordination

Some of the experts backed the view that the technical scope of the projects was too ambitious for the contractually set duration of construction works. This also led to the involvement of an excessive number of internal stakeholders (lending banks and constructors) in each project and resulted in increased coordination and decision making difficulties which added to the delays observed.

Furthermore, the experts expressed the opinion that regardless of the crisis, the construction of some of the new sections was not justified by the traffic forecasts. The inclusion of these sections resulted in considerable unnecessary increase of the projects' budgets and loans which in turn increased the financial risk and enhanced the need for the financial models' update and eventually payment suspension and contract renegotiation. The motives identified by the experts behind state decisions promoting clearly unviable sections are mainly political. This is in line with Guasch's (2004) observations about cases of opportunism by newly elected governments, as well as with the experience from Portugal, where the government launched unnecessarily large infrastructure projects predicting that they would not be accountable when costly renegotiations would be required (Macario *et al.*, 2015). In the case of Chile, in order for the Concessionaires to undertake additional investment in many of the motorway concessions, a pre-fixed amount of guaranteed revenues was determined and the duration of the renegotiated concession shifted from being fixed to being variable (Carpintero and Barcham, 2012; Carpintero *et al.*, 2014).

4.3 Legal permits and consents

The experts supported very strongly the view that the inefficiency of the administrative and judiciary procedures for the obtainment of various legal permits and consents have had an extremely adverse impact on the progress of the PPP projects, especially given the unrealistically optimistic State commitment to deliver the site within 12 months. Indicatively, in the Concession of Ionia Odos only 53% of the land had been delivered in more than 3 years from its starting date (MoT, 2011). Furthermore, environmentalists and local financial interests in many instances abused the legal procedures and delayed significantly or even annulled parts of projects for environmental reasons. Further to the above, the archaeological investigations as well as the relocation of Public Utilities' networks, both required at numerous locations along the various axes, also led to further delays. For all the above reasons, at the end of 2010, i.e. after the 50% of the total contractual construction period had elapsed, the actual work progress of Central Greece Motorway, Olympia Odos and Ionia Odos corresponded to the 14%, 24% and 25% of

the planned progress (MoT, 2011). Given the fact that the State had fully undertaken the associated risks, the constructors raised claims of more than €1,000 million.

The above confirm Roumboutsos and Anagnostopoulos' (2008) view that the public decision making and approval processes as well as the archaeological findings are considered to be the most risky issues in Greece. Similarly, Macario *et al.* (2015) support that compared to other countries, Greece has a heavier and more confusing legislative framework requiring the involvement of many different public entities. However Greece is not the only country facing such problems. Similar phenomena of inefficiencies induced by administrative procedures have also been reported in the PPP projects in Portugal (Cruz *et al.*, 2014; Cruz and Marques, 2013) and Poland (Carpintero, 2010). Besides, regulatory and administrative frameworks as well as the rule of law and bureaucracy quality have also been reported by Guasch and Straub (2009) as factors affecting the efficiency of infrastructure concessions in Latin America.

4.4 Design and external stakeholder management

The majority of the PPP motorway projects required a great multitude of post award design modifications which, according to the experts, were associated with the poor basic design of the State, the delay in expropriations, the need to minimise archaeological investigations or avoid findings. Furthermore, in some instances, alternative technical solutions of greater cost and time efficiency were identified (e.g. replacement of bridge by embankment following a slight shift of the alignment). For instance, 14 such design optimisations were approved for 'Ionia Odos' and another 15 for 'Central Greece Motorway' (MoT, 2011). Extensive design changes have also been reported for similar reasons for the projects of Portugal (Cruz *et al.*, 2014; Cruz and Marques, 2013), while Carpintero and Barcham (2012) also criticise the quality of designs for the projects in Mexico.

In addition, the experts also highlighted the fact that the local communities in many instances hampered the projects' progress with unrealistic and/or unreasonable requests for design changes with no strategic value. The above confirms Verweij's (2015) view that external stakeholders can hamper or advance project implementation.

The overall poor design and external stakeholder management resulted in considerable delays as in some sections even two years had to elapse for designs to be completed.

4.5 Toll policy

The commencement of the new motorways' construction entailed the opening of numerous toll stations in the existing motorway sections in an attempt to decrease the respective borrowing needs (cross-subsidy). However, as the experts highlighted, the toll policy implemented by the State was largely unfair for three reasons: the level of service provided in the existing sections was not always high enough to justify the collection of toll fees; the selected open toll system involved too high charges for the

local users who had no alternative road network to use; the applied charge was not proportional to the length of motorway used.

However, the demand for services and users' willingness to pay is highly correlated to social acceptance and the feeling of fairness (Roumboutsos and Pantelias, 2015). Actually, when the repayment mechanism is considered 'unfair', the success of the project in social terms is questioned (Liyanage and Villalba-Romero, 2015). On the top of the above, from 2010 onwards the financial crisis had dramatically reduced the spending ability of Greeks. For all these reasons, a massive refuse-to-pay movement was developed with regular protests and toll stations' occupation. This movement further reduced the toll revenues as thousands of drivers who were willing to pay were very frequently obstructed to do so. For instance on January 2011, almost 20% of the drivers refused to pay the toll fees at stations along the 'Aegean Motorway' (MoT, 2011).

5. Lessons learnt and Recommendations

The experts' observations confirmed the view by Verhoest *et al.* (2015) that the level of PPP maturity in Greece is not commensurate with the respective investment. Clearly this applies to the majority of the countries with extensive PPP programmes, as the relevant literature reveals. In this context, the experts were asked to draw from their long experience and make recommendations addressing the areas of weakness previously identified. This section includes a synthesis of their recommendations. As Yin (2016) notes, recommendations backed up with evidence from interviews ensure the research's transparency.

5.1 Financial crisis and traffic risk

Beyond the fact that the exact consequences of a financial crisis are almost impossible to predict, an advisable practice composed by different experts' opinions would be for the State to determine in the tender documents an acceptable minimum and a maximum traffic threshold which would represent the boundaries of a 'normal' range of traffic for the project. Within this range, the commercial risk should be borne by the Concessionaire; in case of lower traffic levels the State should fully compensate the Concessionaire for the respective shortfall; in case of higher traffic levels the Concessionaire and the State should share the respective revenue gain at a predetermined percentage. Had this provision existed, the Lending Banks would not have suspended the drawdown payments, the projects' construction would not have stopped and the interest rates would have been lower.

5.2 Project scope, planning and internal stakeholder coordination

The recommendations for this theme were various and diversified. Several experts backed the view that the total scope of the five projects should have been broken down into smaller contracts of €500 - €700 million each; this would have allowed for smaller construction schemes involving fewer stakeholders, better handling of the lending needs and a more streamlined decision making process. The majority however opposed

this approach supporting that the viability of the projects was inextricably linked to their scope as tendered; any different fragmentation would lead to possibly non-viable projects due to much bigger overhead costs, loss of economies of scale, multiple different approaches and claims on behalf of the constructors for the State to deal with.

Regarding the sections with low traffic forecasts and marginal financial viability, the experts in their majority backed the view that these should have not been included in the scope of the PPP projects. Instead, they should have been constructed by the State under the terms of usual public work contracts or not constructed at all. The scenario of an agreement enabling the Concessionaires to defer the additional investment for a time when a guaranteed level of revenues would be achieved, as happened in Chile, was only supported by a small minority of the experts interviewed.

5.3 Legal permits and consents

The experts unanimously supported the view that a different legislative framework is the only feasible way for any improvement in the field of legal permits and consents to be achieved. For the issue of expropriations, they suggested that the State should:

- Make use of the existing legislation allowing for fast-track procedures and completion of the judicial process within a much shorter period.
- Establish the preparation of land valuation reports by independent accredited experts and not by Public Services.
- Hire suitably qualified checkers to ensure that the topographic maps used to determine plot boundaries and owners are correct.
- Give the Concessionaire the right to rent and occupy the site before the determination of the final compensation by the Courts which could take months or even years.

For the archaeological investigations and public utilities' networks relocation, the experts' recommendations included:

- Closer and more active cooperation of the Ministry of Infrastructure and the Concessionaires with the Archaeological Services / Public Utilities with the aim to timely identify areas to be avoided at the stage of preliminary design.
- Immediate commencement of investigations/relocations as soon as the alignment has been finalised.
- Improved legislation framework mandating the Archaeological Services to actively participate in public consultation and commit to a specific schedule and budget for the investigations before the commencement of the construction period.
- The cost of the works should be borne by the State; the Concessionaires would proceed to advance payments in order to eliminate delays associated with low availability of State funds.
- Alternatively, the State should tender these preliminary works separately, through small contracts awarded immediately after the alignment's finalisation. The Concession period would only start after their completion.

5.4 Design and external stakeholder management

According to the experts, the consequences of the extensive design changes could have been minimised with the implementation of the following:

- Selection of the procurement procedure of the Competitive Dialogue to enable the evaluation of many alternative alignments and eliminate the influence of local interests and political pressures.
- Establishment of stricter procedures for the evaluation of the technical quality of designs with the involvement of independent, internationally sourced evaluators.
- Clear deadlines within which the constructor can propose design optimisations and the State can either accept or reject them.
- Clear description in the tender documents of the socio-economic priorities of the State according to the principles of value management so as for non-compliant changes to be discouraged in advance.
- Clear description in the tender documents of the distribution mechanism of the benefits that may occur as a result of the design changes, between the State and the Concessionaire.

Regarding the additional delays resulting from the requests of the local communities, according to the experts, these could have been mitigated to a significant extent with proper planning based on:

- Compulsory involvement of a private technical consultant as a mediator responsible to discuss with the local community and properly justify their requests according to reasonable socio-economic criteria.
- Strict deadline for the local communities to respond with any suitably justified requests for changes, after the expiration of which their consent would be automatically assumed.
- Allocation of funds by the State for the execution of proper compensatory projects for the local communities (e.g. anti-flood works). These could be sourced from the savings created by previously accepted cost-efficient design changes.

5.5 Toll Policy

The experts agreed that it was the State's responsibility to select a more suitable toll policy. They unanimously supported the introduction of charges proportional to the length of the motorway used by each vehicle as in their opinion the sense of unfairness is the major cause of the public protests. Some of them also criticised particularly strongly the practice of subsidization of revenues through toll collection along existing motorways, as the users of the latter pay for the construction of a project that they may never use. Other recommendations included:

- Discounts for frequent users and subsidisation for some sensitive groups of users (e.g. for disabled persons).

- Application of greater charges for the heavy vehicles as they are responsible for the greatest part of the road's wear and maintenance required.
- The payment to be effected at the end of the section used so as for the driver to get the service before they need to pay.

6. Conclusions

PPP programmes have been applied worldwide for the last 25 years and in numerous cases they have ended unsuccessfully with a significant gap between the expected outcomes and the actual results. This research evaluated the problems encountered by the recently completed PPP programme in Greece encompassing five new motorway axes with a total length of 1,404 km. Fifteen semi – structured interviews were conducted with CEOs of Concessionaires and Independent Engineers as well as with senior officials of Greek Ministries. The experts supported that the main causes behind the failure of the projects were the unforeseen revenue collapse due to the financial crisis as well as various contractual, technical and regulatory inefficiencies. Drawing from their long experience they made recommendations for key improvements in the aforementioned fields, offering thus a concrete basis for the development of a more efficient and streamlined framework of procedures for future PPP undertakings worldwide. As the current research does not include details on the contracts' renegotiation, research could be further expanded with the participation of State officials who led the renegotiation process towards a deeper investigation of the State's strategic priorities during the contracts' 'reset' period. Furthermore, given that the current research is based on the limited number of PPP projects actually taken place in Greece, it would be useful for an international quantitative survey to be conducted around the themes highlighted as areas of failure for the Greek PPPs. This survey's target group should be limited to organisations members of the European Association of Operators of Toll Road Infrastructures (ASECAP) and the International Bridge, Tunnel and Turnpike Association (IBTTA), so as to ensure that the participants do hold the experience and expertise required.

7. References

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