

ENDOGENOUS DETERMINANTS FOR
RENEGOTIATING CONCESSIONS:
EVIDENCE FROM LOCAL
INFRASTRUCTURES

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Abstract

There is a global trend for local governments to engage in public-private partnerships (PPPs) to provide infrastructures and public services. Light rails, water systems, waste management, schools, sport centres, social housing, are just a few examples of sectors where the private sector is becoming more actively involved with local authorities. Most of these engagements are done through mixed companies and contractual concessions. Both suffer from a major shortcoming – renegotiations. Contracts are often renegotiated within few years after signature, and some evidence show that the results might not protect the public interest. This paper tries to understand how and why renegotiations of local concessions happen by looking at the specific characteristics of contracts (endogenous determinants). To illustrate the discussion, a case study from a light rail system is analysed, exemplifying the effect of a contractual renegotiation. The authors argue that contractual renegotiation can be useful in decreasing contract incompleteness, but a poor design of these clauses can allow for opportunistic behaviour by concessionaires.

Keywords: Concessions; renegotiations; public infrastructures; local government; light rail services.

ENDOGENOUS DETERMINANTS FOR RENEGOTIATING CONCESSIONS: EVIDENCE FROM LOCAL INFRASTRUCTURES

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1. Introduction

Local authorities have been dragged by the potential benefits of public-private partnerships (PPPs) to develop infrastructures and provide public services, surpassing strong budgetary constraints. Although initially developed by Central Governments, rapidly became an important instrument of infrastructure delivery by municipalities. The Portuguese municipalities first started using PPPs in water and wastewater services, in the mid 1990's, but over the last decade they were expanded to urban transportation, schools, social housing, sports centers, cultural centers/services, solid waste management, car parking facilities, among other types of infrastructure and/or services. In developing these partnerships, both institutionalized and contractual PPPs were carried out. This classification was first adopted by the European Commission: institutionalized PPPs are those where a mixed capital (public and private) firm is created while contractual PPPs concern those cases where the relationship between the two parties is set under a contract. Several authors have studied institutionalized PPPs for the provision of local services and infrastructures (e.g., Bel and Fageda, 2010; Cruz and Marques, 2011; Marques and Berg, 2011a), but the focus of this paper will be the contractual PPPs.

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Infrastructure concessions are a mechanism to bring competition into natural monopolies, as in most infrastructures (Demsetz, 1968). What seemed to be the solution to overcome the lack of competition in public service provision was rapidly questioned by the contributions on contract incompleteness, particularly the seminal work of Williamson (1976). Opportunist behavior becomes a concern, mostly due to barriers to entry and large sunk investments, leading to several renegotiations.

The issue of renegotiation is becoming increasingly important since PPP arrangements are more frequently used, at both the local and national level, and empirical evidence supports the thesis that most concessions end up being renegotiated. Recently, in May 2011, the UK government announced the intention of renegotiating 150 schools PFI contracts signed by local authorities, and establish common frameworks to develop these schemes, since the heterogeneity among contracts was not having good results. These renegotiations often entail large costs for both users and local governments (Gagnepain et al., 2010; Cruz et al., 2011).

Renegotiations are vulnerable to opportunism by both parties. Some authors have analyzed the main reasons behind governmental opportunism (Guasch and Straub, 2009; Engel et al., 2006; Estache and Wren-Lewis, 2008) while others have adopted the concessionaires' perspective (Guasch, 2004; Bajari and Tadelis, 2001; Bajari et al., 2007). Local governments can leverage their bargaining power on the high sunk investments made by the concessionaires in most concessions. These large barriers to exit mean that they cannot just "walk away" from the contract. On the other hand concessionaires often engage in "under-bidding" to win the concession (or over bidding, depending on the award criteria). If the likelihood of renegotiation is high, especially in the first years, the concessionaire main goal is just to get the concession, and open the renegotiation to break-even. This takes place in a non-competitive environment, and a low probability for contract recapture by the government, due to high transaction costs, and public claim of failure (Guasch, 2004).

This paper is a sequel of another work by the authors that looked into the exogenous determinants of renegotiations. For this purpose *endogenous* means

imbedded in the concessions' contract, like the renegotiation clauses that define the rules by which the process can be triggered. Those might be directly related to the renegotiation process, e.g. if the one of the parties acts unilaterally, then the contract proceeds to renegotiation, or related to the risk sharing of some variables – e.g. if the demand is lower than X , then the concessionaire is entitled to a renegotiation. The focus of the paper is renegotiations in contractual PPPs (concessions), although renegotiations can also occur in institutionalized PPPs. We believe this distinction between endogenous and exogenous might provide a useful framework for those working on renegotiations. Besides, the extensive theoretical overview on the different types of endogenous determinants, is also valuable both for practitioners as for academia.

The paper is organized as follows. Section 2 provides a global literature review on renegotiation of concessions, showing how academic works have been evolving towards empirical analysis of real data from the countries experience. In Section 3, the authors make a theoretical discussion on the main determinants, both endogenous and exogenous, that affect and lead to contract renegotiation. In Section 4, endogenous determinants are analyzed and discussed in more detail. Section 5 presents the case study – a light rail system developed in Portugal – and is analyzed under the theoretical framework previously developed. Section 6 contains the main conclusions and some policy implications for local governments.

The issue of what drives renegotiations has occupied several academics over the last 7 years. Initially, in the 1990s, several authors made theoretical contributions to this area, like Green and Lafont (1992), Crocker and Reynolds (1993), Aghion et al. (1994), Artana et al. (1998) and Hart and Moore (1999). These theoretical contributions were essentially aiming at studying agents' behavior under incomplete contracts, and identifying incentives for opportunistic behavior. In the 1970s and 80s, literature on renegotiations looked essentially at the relation between concessionaires and public grantor agencies or governments, from the perspective of contract theory and contract incompleteness (Williamson, 1976; Tirole, 1986; Dewatripont, 1988; Hart and Moore, 1988).

The renegotiation process

Overview

A renegotiation takes place when the contract is no longer able to cope with present circumstances. The parties, the government and/or the concessionaire, ask for the renegotiation when they can no longer comply with the contract terms.

Over the last decade, the countries' experience with PPPs was enough to provide relevant data, and several empirical contributions were made, for example: Engel et al. (2003), Guasch (2004), Nombela and Rus (2004), Guasch et al. (2005 and 2008), Estache et al. (2009b), and more recently, Cruz et al. (2011).

Table 1 shows the major contributions to renegotiations over the last three decades. Following important theoretical models and contributions over the 80s and early 90s, while, simultaneously, several programs of infrastructure development through concessions have been made all over the world, but particularly in Europe and Latin America, more recently the literature has been providing more empirical evidence of the phenomenon, especially over the last 5 years. This type of research provided invaluable evidence on how renegotiations are effectively tackled by governments and concessionaires, and, most of all, how often they take place.

The literature does not provide much evidence of local concessions. One of the reasons might be related to the difficulty in obtaining information. While concessions granted by the national government are usually more scrutinized by public opinion, and even, by supervisory bodies like Courts of Audit, in local concessions there is much less transparency. This problem is not exclusive of Portugal or Latin America, but it also applies to wealthier economies like Canada, the UK or Australia.

Table 1 – Summary of Literature Review on Renegotiations

Theoretical Models/Contributions	Williamson(1976, 1979); Klein et. al (1978); Holmstrom (1982); Tirole (1986, 1999); Dewatripont (1988); Hart (1988); Hart and Moore (1988, 1999); Green and Laffont (1992); Aghion et al. (1994); Edlin and Hermalin (1997); Masking and Moore (1999); Tirole (1999); Nombela and Rus (2004); Hart and Moore (2007); Bajari et al. (2007); Estache and Wren-Lewis (2008); Casas-Arce (2009) and Engel et al. (2009).
Empirical Contributions	Crocker and Reynolds (1993); Artana et al. (1998); Bajari and Tadelis (2001); Engel et al. (2003); Estache et al. (2003); Guasch (2004); Guasch et al. (2005); Bennet and Iossa (2006); Estache (2006); Vassallo (2006); Guasch et al. (2008); Brux (2009); Estache et al. (2009a, 2009b); Guasch and Straub (2009); Littlechild (2009a, 2009b); Gagnepain et al. (2010); Marques and Berg (2010); Baeza and Vassallo (2010), Marques and Berg (2011a) and Cruz et al. (2011).

The process for developing renegotiations is highly asymmetrical from country to country, and among different sectors. In some cases, the regulator has an important role in supervising the process (in the UK through the Partnerships UK, or in Partnerships Victoria - Australia), while in others there is no third agent, and the process becomes just a bilateral negotiation (e.g. light rail systems, roads and water sector in Portugal). As one might expect, the existence and intervention of a regulator while supervising the contract design and renegotiation process can decrease the incidence of renegotiations (Guasch, 2004; Cruz et al., 2011). In bilateral negotiations agents can engage in opportunistic behaviors more easily, and problems with information asymmetry are more acute.

Exogenous determinants for renegotiations

The authors define exogenous determinants as factors external to the contract, i.e., more related to the external environment, sector, regulator, or even some project features, but not to contractual clauses that influence the likelihood of renegotiation. These last are considered endogenous.

The next sub-sections will present a theoretical list of the main exogenous determinants for renegotiations. Some of the determinants may not be applied on a certain country or to some types of projects, rather representing various possibilities.

External environment

a) Macro-economic environment: most infrastructure concessions are not immune to economic cycles, though one may argue that public service concessions, like public transit, water systems or hospitals/health services are less affected. The economic down or upturns can impact in one or both sides of the financial equation: demand and costs.

b) Justice system: The justice systems can play a determinant role in renegotiations, but this issue has been poorly treated in the literature. When the renegotiation fails, i.e., the parties cannot reach a common understanding, courts are the ultimate solution for the conflict resolution. Taking the renegotiation into courts can only solve the problem if the justice system is reliable, fair and fast. If, for any reasons, the system cannot be trusted, and/or works poorly, agents (grantor or concessionaires) can be forced to accept solutions that do not increase their welfare.

c) Political stability: Political stability can interfere with renegotiations at different levels. In Guasch (2005), the author argues that newly elected officials are more likely to renegotiate contracts. The rationale is that the more instable the political environment, with more elections, the higher the probability of renegotiation. Different political parties can have different ideas for the project, and engage in unilateral contractual changes. On the other hand, a majority government, or

municipal executive, can have a higher degree of independence when signing contracts, and therefore engage in less transparent renegotiations, compensating the concessionaire in a non-competitive and non-transparent way. An example of this behavior is the extension of a seaport concession in Lisbon Port. The Government extended the concession, for the second time, for a period of 27 years. The total concession is now 57 years. The parliament, where the Government did not had majority, decided to annul the contract, since it was harming the public interest. In countries where the local government model has an executive body and a municipal chamber elected separately (a type of bi-chamber model), this issue can be particularly sensitive.

d) Political bias: political bias happens when politicians want to develop projects without economic viability. In order to launch the project, local, regional and central governments are over-optimistic in forecasts and NPV, biasing the process. Baeza and Vassallo (2010) found that the main reason for renegotiating Spanish toll road concessions was due to excessive optimism in traffic forecasts. The same happened in several types of concessions in Portugal (light/commuter rail, water systems and roads).

e) Force majeure: force majeure events are usually a risk not assumed by concessionaires, and that can originate renegotiations. The probability of occurrence is relatively low in most countries, but the impact of these events can be demolishing. The recent earthquake in Japan was responsible for the destruction or significant disruption of several critical infrastructures.

f) Likelihood of repeated business: in a sector, or country, where the concessionaire expects to engage in several contracts in the future, it may be willing to accept renegotiations (or avoid them, depending on the initiator), to keep “the reputation”. This phenomenon is known in the literature on psychological economy as “reputation mechanisms” or “value of reputation” (see more in Curhan et al., 2006; Fombrum, 1996).

Procurement process

a) Type of award: concessions can be awarded through public tenders or directly. Nowadays in most developed economies, contracts are awarded through international tenders, but some of the first concessions, or at some specific sectors (e.g. ports), they were awarded directly without competition. Cruz et al. (2011) found a positive correlation between tenders and probability of renegotiation, i.e., concessions awarded through public tenders are more likely to be renegotiated, than those directly awarded. This can be interpreted as a form of “winners’ course” or aggressive bidding (Hong and Shum, 2002; Ubbels and Verhoed, 2008; Baeza and Vassallo, 2010). The “winners’ course” effect tends to increase with the number of bidders.

b) Number of bidders: The purpose of public tenders is to ensure that competition will allow governments to select the best bid. The higher the number of bidders, more competition is ensured, and therefore the probability of maximizing the *value for money*, increases. On the other hand, intense competition can result in the referred “winners’ course” (Hong and Shum, 2002; Ubbels and Verhoed, 2008). Excessive competition can lead to underbidding, if bidders believe it will be likely to renegotiate the contract to break-even.

c) Award criteria: The criteria used to choose the best bid, can have a direct impact in the probability of renegotiation. If the main criteria used is the lowest bid (or higher, depending on the type of award), there can be perverse incentives to concessionaires to underbid, expecting to break-even in posterior renegotiations.

Financing scheme

a) Type of remuneration scheme: a concessionaire can be remunerated through user charges, payments by the grantor (in availability schemes for example: used in many schools PPPs), or a combination of both. When the revenues do not depend on demand, and are based on availability, the likelihood of renegotiation is smaller, since there is no relevant uncertainty in revenues. On the other hand, if revenues are exclusively, or depend largely, on users charges, uncertainty is much higher, thus the contract is more likely to be renegotiated.

b) Ratios debt vs. equity: a higher percentage of debt in the portfolio of financing sources can increase the exposure of projects to external financial market shocks. For example, with the recent crises in sovereign debts of some European countries, like Ireland, Greece, or Portugal, bonds issued by these governments suffered dramatic increases, as did the bond insurance. To prevent concessionaires to hold the entire financial risk, some contracts in the Portuguese concessions, placed a cap in the Euribor (Euro Interbank Offered Rate), the indexing rate usually used in most European projects. Though this relation is not linear, one may argue that a higher exposure to debt can increase the risk of renegotiation.

Project characteristics

a) Investment/duration: The literature on contract theory enforces the idea that longer concessions will tend to be renegotiated more often, mostly due to the difficulties in forecasting for long periods, particularly as far as demand is concerned. Since demand affects revenues, and its estimation becomes more difficult in the long run, the projects' return and profitability have a significant underlying degree of uncertainty. Likewise, larger concessions, with higher investments, can be more exposed to risk, especially because of cost overruns, well-known in infrastructure construction.³ Larger projects are usually more complex and atypical, consequently less standardized and more prone to contingencies. This helps explaining why renegotiations tend to happen very early in the contract life. In the first years of operation the two most relevant uncertainties, construction and demand are already known. In many concessions this leads to a refinancing of the project, since at this stage, risk is lower, and, under normal circumstances, more affordable financing conditions can be found.

³ The construction of large infrastructure like highways, metro systems, water supply systems, oil and gas pipelines, airports, hospitals, among others, is exposed to a great deal of risk regarding duration, costs and quality control (see more in Skamris and Flyvbjerg, 1997; Flyvbjerg *et al.* 2003).

Regulatory environment

a) Existence of regulator: The urge of local and central governments in developing PPPs, can affect the establishment of a strong regulatory body to supervise the award process and contract design. As a consequence, many concessions were signed without any supervision from a regulatory body. The literature provides some evidence that the absence of a regulatory body when contracts are signed has a positively influence on the probability of renegotiation (Guasch, 2004; Cruz et al. 2011).

b) Type of regulation: The existence of the regulator *per se* is not sufficient to ensure the protection of the public interest during the renegotiation process. The type of regulation or mechanisms to enforce the regulator recommendations and directives play an essential role (Estache et al., 2009b). For example, in the Portuguese transportation sector, though an analysis of the renegotiation is mandatory by the regulator, it is not binding. Therefore, concessionaires and grantors are completely “free”.

The literature provided important statistical evidence of the main exogenous drivers for renegotiations. For example, concessions with large investments are more likely to be renegotiated. The regulatory environment also has an important role in the process (Guasch, 2004, Cruz et al., 2011), as does corruption (Estache et al., 2009b; Guasch and Straub, 2009), or the political pressure due to election (Guasch et al. 2008).

The patterns for renegotiation have also been studied, though it is difficult to define a common framework for the renegotiations that happened worldwide, except for the fact that the global likelihood for renegotiations is always high (41% in Guasch, 2004; and 67% in Cruz et al., 2011). There is some convergence about the sectors most likely to suffer from renegotiations: transportation infrastructure and water services.

Endogenous determinants for renegotiations

As earlier explained, for the purpose of this paper endogenous determinants are those imbedded in the contract: contractual clauses with direct impact on the course of the renegotiation, either in opening the process, managing it, or terminating the contract. The last can also be considered a form of renegotiation, the most radical one.

Risk sharing agreement

Risk sharing is intrinsically related to the likelihood of renegotiation. When the private sector assumes all the risk, or most of the risk of the concession, it will less likely ask for renegotiation. On the other hand, when the public sector limits some risks, such as demand and the reality turns to be worse than expected, then the concessionaire will ask for the renegotiation of the contract. For example, in highways concessions where the traffic risk is all assumed by the concessionaire, the fact that traffic is lower than expected does not entitle the concessionaire to the right of renegotiating. However, in some of those cases, it can still try to renegotiate. On the other hand, if the concessionaire only assumes the risk of a small percentage of deviation in traffic it can only claim the renegotiation of the concession if the traffic is below that lower limit.

Termination clauses

The termination clauses essentially influence the bargaining power of the government in renegotiations. If termination clauses overprotect the concessionaire, e.g. by determining that all future profits until the end of the contract should be paid if the contract is terminated, the government does not have the real possibility for capturing the concessions if the due time is still far away.

Re-equilibrium clauses

Re-equilibrium clauses define how the financial re-equilibrium of the concession should be restored. In cases where some event triggered the renegotiation, some contracts have specific clauses stating which should be the indicators that the renegotiation should fulfill, e.g., most of the Portuguese contracts specify that the Internal Rate of Return (IRR) of the concessionaire has to be guaranteed. This strongly limits the outputs of renegotiation.

KPIs for triggering the renegotiation

In some contract it is possible to find a list of key performance indicators (KPIs) to monitor the contract performance, and, if the lower (or upper depending on the KPIs) is reached, the concessionaire can automatically initiate the renegotiation. Some of these KPIs are related to demand, e.g., traffic volume in highways, while others are financial IRR, Debt Coverage Ratio, etc.

Summary

Table 2 summarizes the main determinants of renegotiation and presents a qualitative assessment of the impact of each determinant on the probability of renegotiation.

Table 2 – Summary of the renegotiation determinants

Type of determinant			Impact on the probability of renegotiation ⁽¹⁾
Exogenous determinants	External environment	Macro-economic environment	++
		Justice system	+
		Political stability	++
		Political bias	+++
		Force majeure	+
		Likelihood of repeated business	+
	Procurement process	Type of award	+
		Number of bidders	+
		Award criteria	+
	Financing scheme	Type of remuneration scheme	++
		Ratios debt vs. equity	+
	Project characteristics	Investment/duration	++++
	Regulatory environment	Existence of regulator	+++
		Type of regulation	+++
Endogenous determinants	Risk sharing agreement		+++++
	Termination clauses		++
	Re-equilibrium clauses		+++++
	KPIs for triggering the renegotiation		+++++

⁽¹⁾Qualitative assessment

Contractual triggers for renegotiation: “opening” the contract

Most concession contracts developed in Latin countries have a list of events or “key performance indicators” (KPIs), for clarifying the conditions under which the renegotiation process can be initiated. Some are related to actions taken by agents, e.g. unilateral contractual changes, but can also be quantified as thresholds for some indicators, e.g., variations in demand.

This set of contractual clauses is defined as “contractual triggers” for renegotiation. The authors propose a two level classification for these triggers: qualitative and quantitative.

Qualitative “triggers”

Qualitative triggers are related to actions or changes that affect the contract performance, and can have different forms. A well-known “trigger” is the unilateral contractual change. Municipalities or national governments, after signing the contract can introduce changes in contract: a) in the concessions scope, adding or removing services, e.g., removing a metro line or stops by offering other alternatives; b) changing the investment plan, anticipating or delaying investments, or even changing the configuration of the project itself, e.g., changing the location of stations on a local transit system project.

Some changes are not a direct responsibility of the grantor, but also allow for renegotiations: *i)* changes in the legal framework, usually a responsibility of central or federal governments, able to rise costs or decrease revenues; *ii)* deficiencies in services upstream, usually services that influence the performance of the concession, but are not under control of the concessionaire, e.g., in transit systems problems with energy supply (most common in developing economies), or in local water services concessions, problems related to water supply by the wholesale provider can allow for the contract renegotiation.

Quantitative

Quantitative indicators are associated with measurable changes in some indicators.

There are two sets of indicators, related to *i)* key inputs of the concession, and *ii)* general financial indicators concerning the overall financial and economic performance.

The first types of indicators are usually related to demand/consumption. In road concessions, for example, these indicators usually are variations in traffic. Vassallo (2006) showed how Chilean road concessions have mechanisms to deal with traffic variations, lower and upper limits in traffic volume, and when the traffic is below the lower limit the concessionaire is entitled the right to renegotiate. The same model is sometimes found in local transit services, considering as variable passengers.quilometer, or in water services (water consumption). Later, in this article, a case study of a light rail service will be presented.

Another important “input” to the economic performance of the concession is the cost of capital. Usually the cost of financing is an exclusive responsibility of the concessionaire, but in some Portuguese concessions it is possible to find a cap in interest rates. The proxy used in the case study for the cost of capital was Euribor 6 months. Any deviation higher or lower than 20% will initiate a renegotiation process.

The second type (general financial indicators) usually includes the IRR, DSCR, or LLCR. In case any change happens under the responsibility of the public sector that might impact the economic performance of the concession over the thresholds defined to each of the indicators, the renegotiation process is opened.

Rules for restoring the economic and financial re-equilibrium

The previous section analyzed the main triggers for “opening” the contract. Despite their relevance, it is not less important to assess the set of rules that manage the process of restoring the economic and financial re-equilibrium which might favor the opportunistic behavior. After the contract is opened, how does the renegotiation proceed?

Discretionary renegotiation

At this point, several different schemes can be found, in different sectors and from different projects. One of the models can be described as a discretionary type of renegotiation. The concessionaire and the grantor analyze together the main reasons for “contract unfitting”, and try to reach a common agreement on the new features of the contract. No specific sets of rules are pre-defined, and both parties are supposed to find new terms for the concession that they both agree on. The results of the renegotiation will be, or should be, supervised by a regulatory agency that checks the “fairness” of the agreement. This is the most common type of renegotiation process and it gives the regulatory body a significant power, but to ensure positive results, it requires a significant level of preparation and know-how by the regulatory agency. It is, however, subject to the traditional problem raised by the literature of “regulatory capture” (Gomez-Ibanez, 2003). This happens when the regulator is not impartial when supervising. It does not mean necessarily to benefit the concessionaire (which leads to the problem of corruption) but, for example, the regulator can be captured by groups of users or even by the government or political parties.

This discretionary type of renegotiation is not exclusive for concessions developed under discretionary regulation regimes. It can exist in contractual renegotiation, as long as the contract does not enclose specific rules for the renegotiation process.

Contractual renegotiation

Renegotiation can be contractually set. In some cases, the same global financial indicators presented earlier, for triggering the renegotiation, are now used as a benchmark in the financial re-equilibrium of the concession. This model is particularly used in several local concessions in Portugal, like light rail systems or water services, but also in some concessions granted by the central government, like roads or railways. On the other hand, this type of renegotiation is easier to supervise, since the rules are set a priori. In a poor regulatory environment this could be an advantage since the regulator, or the court of audit, just has to verify the compliance with the rules. However, it requires much more attention *a priori* when designing the contract. Tightening the renegotiation process by incorporating several KPIs and sets of rules in the contract can be seen as a mechanism to decrease contract incompleteness. Facing the impossibility of foreseeing every possible contingency, this set of rules establishes in advance how to deal with them. Nevertheless, it also reduces the amount of risk assumed by the concessionaire, and explicitly assumes that renegotiations are very likely to happen, particularly if the KPIs do not have a substantial margin for variability.

a) "Tight" contracts

With tight contracts, renegotiation is easily started. Any small deviations from forecasts will allow the concessionaire to ask for renegotiation. With the contract open, two things might happen. First, the re-equilibrium is reestablished only accounting for the event that triggered the renegotiation. For example, demand is below forecast, in order to restore the IRR and/or the DSR, the grantor will have to pay a compensation (usual in light rail systems and roads) or, for example, allow for an extraordinary increase in the service prices (used often in water services). If the event triggering the renegotiation is, to some extent, out of the control of the concessionaire, e.g. ridership in transit services, or water consumption, these renegotiations are inevitable. To avoid this type of renegotiation, the grantor could transfer all the commercial risk for the concessionaire, but that would probably result in extremely high risk premiums paid to the concessionaire. If the

renegotiation only accounts for the event that triggered it, then the renegotiation can in fact be useful to both parties.

b) Permissive contracts

The same is not valid if, under the pretext of a certain event, other changes are allowed. After the contract is opened, due to a specific event, or set of events, the concession economic and financial re-equilibrium instead of being adjusted just for those events, is also used to update other costs that were poorly estimated when bidding. For example, if the concessionaire underestimated the staff, construction costs, administrative costs, or financial costs, and tries to recover losses in the renegotiation process. This phenomenon is the origin for the “winners’ curse”. The bargaining power for the concessionaire to try recover some losses arises from the fact that usually the renegotiation is triggered by an event outside its own responsibility (demand or unilateral contractual changes by the grantor are the most common) and because it is very unlikely that the grantor goes into courts or tries to re-capture the concession.

There is a second set of problems that can arise from local concessions granted by municipalities. In the specific case of local concessions, when there is no independent supervision by a regulator, or a third party, can raise problems related to corruption. Local public officials are not among the best paying jobs in public administration. Nevertheless, they have a tremendous power when renegotiating multi-million euros contracts with multi-national companies. With no formal regulation or supervision by an independent third party, the problem of corruption becomes inevitable.

Case study: Light rail system of Tagus South

Project overview

The Light Rail System of Tagus South is located in the South bank of the Tagus River (Lisbon, the Portuguese capital, is located in the North bank). This transit system is developed across the municipalities of *Almada* and *Seixal* and consists of 13.5 km with 19 stations. The main goal of the project was to improve local mobility, and also to provide a connection between the center of *Almada* and the commuter rail, linking the south bank to the center of Lisbon. The total investment was above 350 million Euros, though the initial forecast was around 268 million Euros, awarded in 2002, for a 30-year period, including construction, maintenance and operation. Due to the large investment, the Central Government provided 260 million Euros to finance the construction of the system, and acted as the grantor of the concession, even though the municipalities had the major role in planning and designing the system. The construction was scheduled to finish in 2005, but only ended in 2008. The delay was due to the lack of enforcement of the grantor's obligations, which led, among other events, to the renegotiation of the contract. Next, the mechanisms and clauses in the contract that deal with renegotiations will be presented. This contract is an example where contractual rules were set to manage renegotiations, including quantitative indicators to trigger renegotiation when certain events take place.

This case study is an example of real application of the financial and re-equilibrium model, where pre determined KPI had triggered the renegotiation, and helped managing the renegotiation process.

Risk-sharing and contractual rules

The development of a light rail system incorporates a large variety of risks, most of them common to other infrastructures: planning, demand, financial, *force majeure*, construction, technological, among others (see Marques and Berg, 2011b). Each of these risks can determine the occurrence of a renegotiation, and the contract contains “rules” to manage each of the risk, and to guide how a renegotiation can take place if any of those risks reach the threshold defined by renegotiation triggers.

Table 2 shows how different risks in the contract allow, or not, for *a posteriori* renegotiations.

Table 3 – Contractual clauses for managing the main risks

(Source: Adapted from the Court of Audit)

<i>Type of risk</i>	<i>Contractual clauses in contract</i>	<i>Mechanism for renegotiation</i>
Network planning	11.7 Object	Compensation for changes in layouts
Financial	13.2 Duration	Compensation through contract extension
<i>Force majeure</i>	22.2 Force majeure	Compensations for unforeseen events
Demand	14.2b Remuneration of the concessionaire	Compensation for insufficient demand
Planning	24.4 Contract capture 30. Economic and financial <i>re-equilibrium</i>	Compensations for unilateral contract changes
Construction planning, legal and environmental	32.7 Construction schedule	Compensation for delays
Archeological	35. Impediments to construction	Compensation for delays
Technological	45. Modernization	Compensation for technological changes

For each risk, the contract explicitly presents a compensation mechanism. But only if the event triggering the renegotiation reaches a pre-determined threshold, there

can be an economic and financial *re-equilibrium*. The next sub-section will present more detail about them.

Demand risk, as one the most critical to the concessions economic sustainability, had a more detailed model to clarify each partner's responsibility on the eventual deviations from forecast. The system used was of "demand bands", particularly common on highway concessions (Vassallo, 2006).

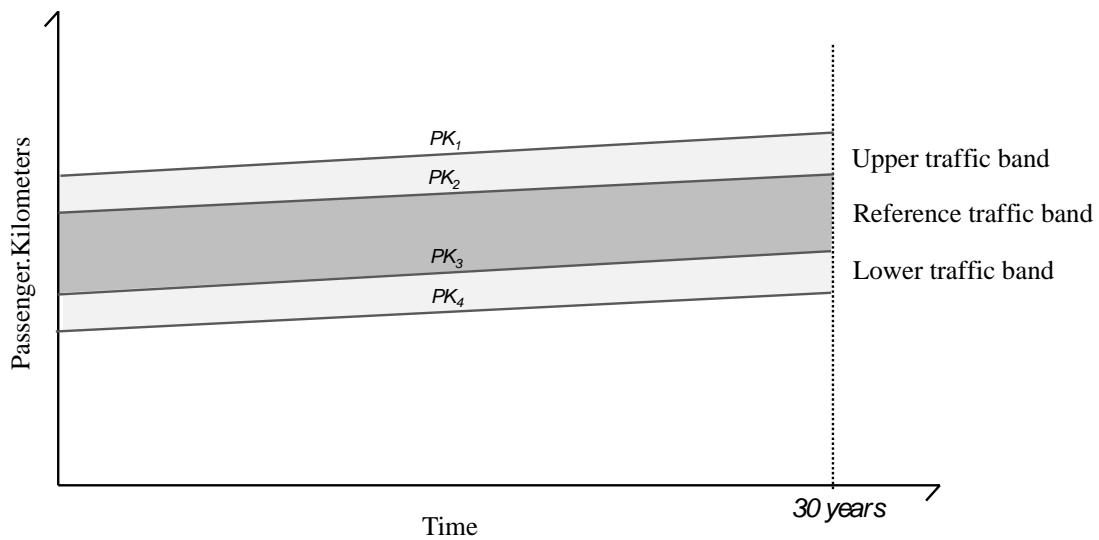


Figure 1 – Band system in Light Rail System of Tagus South

The project revenues are not sufficient to cover operation costs and debt service, even considering that the government paid a lump sum for financing the infrastructure (265 million euros). The public grant was forecasted for a reference band (between lines PK_2 and PK_3). If the demand is higher or lower than those limits, the compensation formula changes. Table 3 presents the formulas for calculating the compensation paid to the concessionaire.

Table 4 – Compensation scheme calculation

<i>Real demand vs. forecast</i>	<i>Formula for calculation</i>
If $PK_n > PK1_n > PK2_n$	$Compensation = RPK_n \times (PK_n - PK1_n) \times 0.15 + (PK_n - PK2_n) \times 0.1$
If $PK1_n > PK_n > PK2_n$	$Compensation = RPK_n \times (PK1_n - PK2_n) \times 0.1$
If $PK_n < PK3_n$	$Compensation = RPK_n \times (PK3_n - PK_n)$
<p>If the traffic is systematically below $PK4$ in the first 3 years of operation, then the concessionaire can request that the grantor takes possession of the concession, and claim a compensation that would result from the following considerations:</p> <p>If $PK_n < PK4_n$ in the first 3 years of operation,</p> <p>Assumption by the grantor of all existing loans; Sum of the following <i>i</i>) reimbursement of the shareholders equity, at the Euribor (6M) rate, and <i>ii</i>) NPV of cash flows, discounted at Euribor (6M), for the remaining period of the concession until the 15th year since contract signature.</p>	

Notes:

- (1) RPK = Revenue per Passenger.kilometer, $RPK = \frac{FR}{PK}$, where FR is the fares revenue and PK is passenger.kilometer
- (2) PK_n , real traffic measured in Passengers.kilometers
- (3) $PK1_n$, upper limit of the upper band
- (4) $PK2_n$, lower limit of the upper band
- (5) $PK3_n$ lower limit of the reference band
- (6) $PK4_n$ lower limit of the lower band
- (7) RPK_n , is the revenue per Passenger.kilometer in year n .

The compensation mechanism defines a decreasing marginal compensation for passenger.kilometer as traffic increases (upper traffic band and higher).

Dealing with contingencies and ex-post renegotiation

What type of events did trigger the renegotiation?

The contract stated that the concessionaire can ask for the contract renegotiation when only one, or more, of the following events take place: *i)* unilateral change or decision by the government that increases costs or decreases revenues, *ii)* any *force majeure* event, *iii)* when some circumstances affect the risk-sharing agreement (e.g., as far as demand forecasts are concerned). If any of these events causes a decrease of 0,03% in one of the following ratios: *a)* Debt service coverage ratio (DSCR); *b)* Loan life coverage ratio (LLCR); *c)* Shareholder's internal rate of return (IRR). In the case of this project, several reasons lead to renegotiation.

Government changing its mind: After the contract was signed, the grantor made 6 physical changes to the project, leading the concessionaire to claim for compensations based on three arguments: cost overrun related to the physical changes, to delays that resulted from changing the project and to postponing of the beginning of the operation. These changes were essentially related to political disputes between the two local officials (from the two municipalities) and the central Government

Lack of enforcement of grantor obligations: the contract stated that the grantor should provide access to the public space within specified dates (construction of a surface light rail system requires a heavy and long occupation of urban public space), and was also responsible for obtaining all the environmental permits in due time. None of the former was fulfilled.

Optimism bias: the reference band was excessively optimistic. In the first year, demand was already significantly below forecasts, and at the end of the second year of operation, the real traffic was 35.000 passengers per day, while the forecast was 80.000.

What type of “remedies” is there for renegotiation?

Once the process is open, the contract establishes explicit rules for managing the process. The concessionaire is entitled the right to restitution of the Debt Service Coverage Ratio (DSCR), and one of the following two indicators: *i)* Loan life coverage ratio (LLCR), or *ii)* Shareholder’s internal rate of return (IRR).

The compensation can be made according to one, or more, of the following options: fare increases, direct compensation by the grantor and/or contract extinction.

What were the results?

In the case of the Light Rail System of Tagus South, the preferred option to compensate the concessionaire was through direct compensations. Increasing prices in public transportation is always politically difficult, and can generate inequalities in the metropolitan area. The fare cannot be calculated just based on the concession, but has to be seen as part of a large intermodal system. On the other hand, increasing the contract extension would not allow reinstating the ratios that “rule” the renegotiation process. Table 4 presents the direct compensations paid by the grantor to the concessionaire. The compensation was calculated for each event that triggered the renegotiation, but there is no information on how those costs were estimated.

Table 5 – Compensations to the concessionaire after renegotiation (in 2005)

(Source: Court of Audit)

<i>Event</i>	<i>Costs (million Euros)</i>
Low Demand	14 ⁽¹⁾
Delay in the environmental permit	3.6
Change in line layout 1	0.8
Change in line layout 2	1.8
Change in line layout 3	3.1
Improvement of accessibility	1.7
Car parking facilities	31.4
Other costs	9.5
TOTAL	62.3

⁽¹⁾ Estimation based on available public information.

The compensations paid to the concessionaire reached 62.3 million Euros, representing 17.8% of the total project. Out of this, 77.6% of the compensation was related to construction costs for changes in the project, and those costs were negotiated in a non-competitive environment – a bilateral negotiation. Since the reasons for the change in the initial project were mostly political, with the subsequent delays, the bargaining power of the government was damaged. Any dispute over the new compensations would lead to increasing delays, which was not an option for political decision-makers at the time.

Even though this contract was “tight” relatively to what could be renegotiated – just the events triggering the renegotiation – the benefits of competition “for the concession” were significantly eroded when 13.4% of the investment (77.6% of the total compensation of 17.5%) was awarded without competition.

Contract management

Academia and practitioners in general, place an important amount of attention in contract design phase, often neglecting the importance of managing the contract. Renegotiations are an extreme example of an interaction between grantor and concessionaire after the contract signing. The responsibility of the grantor does not end with the award of the contract, but instead, the grantor, or the regulatory body, should monitor and manage the contract in a continuous, or at least, frequent way. Not only it allows verifying the compliance of the concessionaire responsibilities, as also decreases the problems with information asymmetry during renegotiations. This case study is an example of how most contracts deal with this issue: there are no formal guidelines for ensuring the management of the contract. The options for managing the contract can vary significantly, from having a dedicated “contract manager” with the responsibility of following the concession, to a more light model of an automatic reporting system for the regulator (or grantor). In any case, most local infrastructure concessions lack these mechanisms, weakening the public sector bargaining power when facing renegotiations.

Main findings

In a complex system like a light rail, the planning and design of the system is surrounded by uncertainties. First, different political leaders have different ideas for the project, and when elections change local officials or governments, it is very likely that the project under construction will suffer changes. Second, the difficulty in forecasting the ridership based on stated-preferences models, for a system that does not exist, is often biased, leading to excessively optimistic forecasts. And finally, the complexity of public works involving the use of large urban public space areas can have impacts in delays and cost overruns. The management of these uncertainties would not be accepted by the private sector, which is not able to control them, or the risk premium required would be prohibited.

Under these circumstances, and to decrease the degree of contract incompleteness, the initial contract stated the rules for managing the renegotiation process, as well as automatic mechanisms to trigger the renegotiation. One can argue whether or not those “triggers” were reasonable since the deviations are extremely low (0.03% in the KPIs). This means that virtually any change will initiate the process.

Renegotiation in public transit system rarely involves an extraordinary price increase in fares. The fare prices of a local light rail should not reflect just the costs and investments of that system, but also have a social implication, and need to be balanced with equity concerns among different suburban areas of a metropolitan system. Since the renegotiation costs were mostly supported by the Central Government, there can be a discussion on whether a local system, benefiting residents and workers of two municipalities, should be supported by all national taxpayers. The project has clearly a local impact and a local dimension, and its beneficiaries are essentially the passengers and the car users. There are some equity questions involved. Direct compensations become inevitable and, in fact, if calculated properly, they can provide a fair solution to the renegotiation. The question relies on how to calculate them. The calculation of the compensation was developed in a bilateral negotiation, without any competition (e.g. in the public works), and therefore with no guarantees of a fair and competitive price.

Conclusions

Renegotiations per se are not a problem. The process of adjusting the contract to new conditions unveiled over time can increase the welfare of both agents (private and public), as long as opportunistic behaviors are prevented. The problem arises when, under renegotiations, the advantages of the competitive bidding disappear. In bilateral negotiations, there is no competition, neither is there any incentive for the concessionaire to present competitive prices. The incentive is precisely the opposite: trying to take the highest compensation possible.

Defining rules for the renegotiation is in fact the most effective way to reduce, or to deal with the incomplete nature of contracts. Accounting for the high transaction costs of foreseeing all possible contingency can be a solution to define, *a priori*, the rules to manage renegotiations that are extremely likely to happen. Nevertheless, the process requires some attention. If the triggers are so low that any uncertainty will initiate the renegotiation, and if the concessionaire can use the process to recover some losses arising from aggressive bidding, then the potential success of the concession is jeopardized. In fact, in this case, when a contractual renegotiation is established protecting the IRR, DSCR or LLCR, the concessionaire is protected against losses, which can have a perverse incentive when bidding.

Even considering that the renegotiation will only attend the events that triggered it, like in the case presented, there is no certainty that the compensation paid will, in fact, be a competitive one. Since the mechanism ruling the renegotiation is to reestablish the IRR, DSCR or LLCR, the concessionaire has a perverse incentive to over-estimate the costs of the changes in the project.

Finally, regarding PPP projects developed by local governments, it was found that there is a significantly lower level of transparency when compared to concessions granted at the national level. In fact, in Portugal it is not even possible to have a complete list of PPP projects carried out by the local authorities, and so, it is virtually impossible to monitor and assess the full impact of the procurement model for municipalities. PPPs have high transaction costs, and the relative weight

of these costs in local concessions is much higher than in national concessions. Are the local governments able to cope with these transactions costs, or are they avoiding them, jeopardizing the ability to effectively manage these processes? Both situations can be found, but the financial constraints on local public budgets increases the difficulties in dealing with these high transaction costs.

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