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Relationship between Regulation and Contract in Infrastructure Industries

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THE RELATIONSHIP BETWEEN REGULATION AND CONTRACTS IN INFRASTRUCTURE INDUSTRIES

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Abstract

This paper discusses the relationship between regulation and contracts in infrastructure industries and the role of economic regulation, including the relationship between contracts and licences. The paper starts with a short survey of the relevant economic and legal issues. The main part of the paper presents examples of how infrastructure contracts, including concession contracts, have been combined with monitoring and enforcement by external regulatory agency. The examples discussed include UK railways and electricity supply from 1840 onwards, French water and toll road concessions and their regulation, as well as experience with contracts and regulation for private finance in infrastructure in developing countries over the last 25 years. These examples provide evidence of both successes and failures from which lessons are drawn. The paper concludes with a short discussion of the role that regulatory agencies can potentially play in supporting private finance in infrastructure, enabling simpler contracts, resolving contract misunderstandings and providing processes for ordered renegotiations.

THE RELATIONSHIP BETWEEN REGULATION AND CONTRACTS IN INFRASTRUCTURE INDUSTRIES¹

1. Introduction and Scope of Paper

It is *contracts* that dominate market economy transactions, not spot market transactions. In addition, for industries with high fixed costs - like oil, steel or pharmaceuticals – it is *long-run contracts* (eg for up to 25 years or more) that are the basis for trading. Spot markets (like in oil and gas) play an important but marginal role in balancing markets, albeit price trends in spot markets provide key information for new contracts and contracts that need to be renewed or updated.

In infrastructure industries², long-run contracts have always played a dominant role, with the sometimes exception of nationalised infrastructure industries. Going back 250 years in the UK and elsewhere, toll roads and then canals and then railways operated under the equivalent of concession contracts. Concession contracts are still hugely important in infrastructure industries in Continental Europe, Latin America and elsewhere – particularly in the water and sewerage industry. In addition, although current and recent UK infrastructure industry privatisations typically involved the use of regulatory licences, as I will demonstrate below, these licences are essentially contractual documents. They are in many ways very similar to concession contracts in terms of their function and content.

However, all long-run contracts have one fundamental problem. No long term contract can possibly imagine all possible contingencies let alone adequately cover them. Aside from known risks, there are just huge uncertainties. In consequence, major economic and commercial surprises will arise, both positive and negative. Hence, *all* long-term contracts are seriously ‘incomplete’. As a result, they need monitoring and review processes that allow the modification of contracts and contract terms in an ordered and accountable way. That is where, for infrastructure industries, ‘regulation’ comes in.

In private sector contracts, disputes between the parties can always be taken to court. However, this is very rare and typically reflects a complete breakdown of trust between the parties (e.g. when Marks and Spencer was - unsuccessfully - taken to court by William Baird for termination of its unwritten but 30 year old supply agreement). To avoid this, long-term private contracts typically have review and modification procedures built into them. Besides annual review and updating, as in ‘open-book’ contracting, these frequently include clauses that allow for arbitration, involvement of external experts, etc.

¹ This paper was written with the financial support of the Water Industry Commission for Scotland. However, the views expressed in the paper are solely the responsibility of the author and do not necessarily represent the views of the Commission, nor of any of its Members or staff.

² Infrastructure industries include electricity, natural gas, water and sewerage and telecoms, although the latter (thanks to network competition) is increasingly becoming more like a standard industry than an infrastructure industry. See also Section 2.

In the resource industry, contracts between multi-national oil, gas and mining companies with national governments typically include binding arbitration in a neutral venue such as Geneva, London or New York under internationally agreed arbitration rules and procedures. This is a weak form of ‘regulation’ in that it involves an external agency to resolve contractual disputes but does not allow for regulatory involvement beyond dispute resolution. However, for infrastructure concession contracts, one frequently finds – particularly in developing countries - that governments establish semi- independent or independent monitoring and enforcement agencies for concession contracts. Some of these agencies also have the power to review and, in particular, to *modify* these contracts following a review instituted by buyer or seller. At this point, the concession contract monitoring agency (or specialist court) is at least as much of a ‘regulator’ as the PPP Arbiter and arguably not very different in its core responsibilities from Ofwat or Ofgem. As I will suggest below, this seems to be what has happened regarding the French water industry.

Following the argument above, the key distinction that I draw³ is between:

(a) Regulation by Contract

Franchise or other long-term supply contracts (including network access contracts) whether between private companies or a private company and a state owned entity, *where there is no regulatory or equivalent agency providing external review and revision of terms* (particularly on prices); and

(b) Regulation by Agency

Utility service providers operate within a framework which provides ex ante regulation *by external agency* for at least some elements of supply, whatever contracts may be in place. This is typically (but not always) associated with private investment and competition on non-monopoly elements.

The argument above is set out in general terms. However, for infrastructure industries there are two major additional reasons why contracts are likely to need to be supplemented by regulation. These are:

- (i) *Infrastructure industries typically have at their centre a monopoly, physical network along which the relevant commodity (water, electricity, natural gas) is transported and distributed. Setting, monitoring and enforcing access terms for this monopoly network is much better done by a regulator than by bilateral contract negotiations between the typically monopoly network provider and the users. Hence, regulated third party access is far more efficient than negotiated third party access.*
- (ii) *The services provided by infrastructure industries are sold to virtually every business and household in the country. Their quality and price are therefore crucial for social welfare and economic performance. In*

³ See Stern (2003) for a full discussion.

consequence, standard terms and speedy disputes procedures are highly desirable, if not essential.

This is most effectively provided by a regulator negotiating and specifying the relevant contract terms rather than leaving it to bilateral negotiation and court enforcement. In general, regulatory reviews are crucial for protecting the interests of *consumers*, particularly small consumers, unless there is significant competition in both upstream bulk supply markets and downstream retail markets.

Bearing in mind these considerations, we will in subsequent discussions set out more clearly the relationship between regulation and contracts in infrastructure industries.

The plan of the paper is as follows. In Section 2, I discuss some underlying economic and legal issues affecting the relationship between contracts and regulation. In section 3, I firstly discuss historical experience (e.g. with nineteenth century English railways). In Section 4, I review French water regulatory developments as well as some lessons from developing country experience with concession contracts and a short discussion of the role of regulation in developing trust between bargaining parties.

One important point is that I do not intend to cover PPP/PFI contracts in this paper. That is partly because they are private contracts between governments and contractors where (unlike standard concession contracts) large parts of the contract, including commercial terms, remain confidential between the parties; but also because they rarely involve external ‘regulatory’ involvement beyond arbitration or similar. In consequence PPP/PFI contracts are special cases of concession contracts, but typically much more rigid, primarily because of the associated back-to-back financing contracts. The London Underground PPP contracts were unusual in that they did have a quasi-regulator in the PPP Arbiter and, because of that feature, I will include that within the scope of this paper⁴.

⁴ Note that one has to be careful about definitions. Much of the literature on French water industry arrangements discussed in Section 3 below labels standard concession contracts but with investment covered in the contract as a ‘PPP contract’. However, they would not be given this label in the UK.

2. Economic and Legal Issues Affecting Infrastructure Regulation Choices

In general, long-term contracts without regulation by external agency may work well or badly. The table below lists some of the main factors which determine when they are most likely to work well or badly. It is intended as a general perspective for all industries with high sunk costs⁵. This includes water and most other infrastructure industries but also includes other capital intensive industries (e.g. steel, chemicals, etc), albeit usually to a lesser extent.

Table 1: Likely Sustainability of Contract Provision With and Without External Regulation

Contract sustainability likely without external regulator	Contract sustainability unlikely unless external regulator in place
<p>1) There are two large and experienced parties to the contract (government and firms or consortia of firms) –</p> <ul style="list-style-type: none"> - there exists a balance of bargaining power and low risks of contract hold-up⁷ <p>2) Demand and demand growth is for a defined product and is relatively predictable –</p> <ul style="list-style-type: none"> - arises with low own-price elasticities and low cross-price elasticities for the product (e.g. water, electricity) <p>3) The technology involved is stable and slowly evolving</p> <ul style="list-style-type: none"> - implying predictably evolving operating costs (e.g. water) 	<p>1) Many parties are involved in the contractual arrangements</p> <p>Major potential hold-up problems:</p> <ul style="list-style-type: none"> - if many contracts need to be negotiated and concluded simultaneously or at around the same time; - if there are large and small parties with varying experience and amounts of bargaining power <p>2) Demand conditions and growth are uncertain and very difficult to predict -</p> <ul style="list-style-type: none"> - raises major questions about revenue recovery plus volume and timing of additional investment (e.g. toll roads) <p>3) There are major technological uncertainties – particularly over future technological possibilities</p> <ul style="list-style-type: none"> - a major issue in 19th century railways and current high technology projects (e.g major IT projects)

⁵ Sunk costs are costs which cannot be recovered once they have been incurred such as investments which cannot be moved or for which no significant second-hand market exists.

<p>4) Investment needs are very largely up-front <i>or</i> failing that, straightforward to predict and agree on - - implying cost predictability and readily achievable contract review</p> <p>5) Construction costs are reasonably certain - - implying a narrow and well-defined risk distribution for construction cost overruns (e.g. repeat standard construction contracts)</p> <p>6) Supply prices (for any target rate of return) are likely to be stable in real domestic terms - and in foreign currency - - implying low risk of major cost/price divergencies from high inflation or major exchange rate shocks</p>	<p>4) Investment needs are distributed over the life of the project and are difficult to predict and agree - - implying major scope for disagreement on ‘need’ for new investment and its financing</p> <p>5) Construction/investment costs are highly uncertain - - implying major uncertainties and wide scope for disagreement on reasonable costs and on risk assignment (e.g. London Underground PPPs)</p> <p>6) Prices may need to be varied sharply in ways that cannot readily be predicted - - eg because of major commodity price shocks and/or exchange rate crises.</p>
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Source: Stern (2005)

The last factor is much more of an issue for developing countries and for the energy industries. But, the previous five are all relevant for UK infrastructure industries.

At first glance, it may seem from Table 1 that there is *less* need for regulatory intervention in water and sewerage relative to contracts than for some other industries. However, that does not take into account two major sets of external effect that are very important for water. These are:

- *public health effects* from inadequate quality or volume of water and sewerage services; and
- *environmental effects* from over-abstraction of water or excess discharge of polluted water.

The importance of these two factors means that the regulatory oversight of water and sewerage provision and contracts needs to be more developed than a simple consideration of Table 1 would suggest. It does *not*, however, mean that it is very difficult or impossible to decentralize via increased use of contracts. As market mechanisms develop for handling externalities – as is happening to a considerable extent with environmental externalities – there may be considerable scope for the unbundling and decentralization of the water and sewerage supply chain. However, water and environmental regulators are likely to have to play a more pro-active role in

defining, monitoring and enforcing the resulting contracts than for the regulated energy or telecom industries.

One other general economic issue is that the existence of an external regulatory entity allows – indeed encourages – the use of *simpler, better written and shorter* contracts. This arises because the existence of an effective regulator can compensate to a considerable extent for the problem of the incompleteness of contracts⁶. The existence of a regulator allows buyers, sellers (and governments) to institute a regulatory review in the face of an unanticipated shock.

In contrast, in the absence of a regulator, a review of contract terms has to depend *either* on contract review/reopener clauses being defined within the contract *and/or* on the agreement of both parties for a review and potential rewriting of key clauses. The problems arising from this issue have been very important for the success or failure of infrastructure concession contracts in developing countries - and were also important in the breakdown of the London Underground Metronet PPP contract.

We discuss these issues further below, concentrating on infrastructure industries like water. We also briefly discuss some legal considerations. Typically, contracts are perceived as *private law* whereas regulation is seen as an area of *public law*. However, as we shall see, in the infrastructure industry area among others, this distinction is far too simplistic.

2.1 Economic Issues Affecting the Need for Regulation in Infrastructure Industries

Even though an infrastructure industry may have a dedicated regulator, for a commercialised industry⁷ most economic transactions (a) between suppliers and (b) between supply companies and final consumers operate via contracts.

For instance, I (like all other UK consumers) have a contract with an electricity supply company for the power supplied to my home. The supply company has contracts, firstly, with generating companies for the bulk supply of that power; and, secondly, with transmission and distribution companies for the transmission and delivery of that power as well as for metering and billing. Finally, the relationships between generating, distribution and supply companies are ruled by a set of contracts and codes that play a major role in the commercial relationships that bind the companies.

So, what is the role of the regulator? In the UK, the electricity regulator:

- (i) typically agrees (and, if necessary, can impose) standard clauses in the contracts between suppliers and final consumers e.g. on quality standards, dispute resolution, interruptions and reconnection, etc;

⁶ See Stern (2003) and the papers cited there. See also Guasch, Laffont and Straub (2007) as well as Brown, Stern and Tenenbaum (2006), pp 77-85 and the papers cited there

⁷ By a *commercialised* industry, I mean an industry where the key elements are all privately owned *or* a publicly owned industry operating with effective commercial autonomy an governed by a board of directors. See Annex 1 for a listing of a set of criteria used by the World Bank for assessing the degree of commercialisation of public enterprises.

- (ii) typically agrees (and, if necessary, can impose) common standards e.g. over frequency and other quality aspects. In particular, the regulator has a crucial role in setting terms, conditions and prices for network access and use;
- (iii) plays a crucial role in agreeing subsidiary codes (like use-of-system agreements), observation of which is a licence condition, and the regulator may have initiating powers regarding these.

The boundary between regulation and contracts is similar in other regulated UK infrastructure industries, although in telecoms – especially mobile telecoms – more is left to contracts and less is regulated. In other countries and network infrastructure industries, the boundaries between regulation and contracts occur at similar points but are handled in various ways. Nevertheless, it is always the same areas that are regulated:

- network access and pricing; and,
- the terms of supply to small (particularly household) consumers.

In general, the table above and other work suggests that the need for regulation to underpin explicit contracts is greater where there are potential major trust issues between commercial companies making large, sunk investments and buyer governments or regulators⁸. Trust - and trust perception - issues are most likely to arise:

- (i) where there are major uncertainties on demand, costs and technology;
- (ii) where there are major new developments in previously unexplored market structures or commercial investment developments in infrastructure industries. These include, for instance: before the first regulatory review of a newly commercialised infrastructure industry, after a major industry and/or market restructuring/unbundling, with a major and untried new technology or commercial model, etc); and
- (iii) in potentially problematic countries/areas (e.g. major infrastructure industry investments in countries with weak institutional environments and/or a previous history of poor treatment of commercial investors).

The last of these is very largely a developing country issue which I will not discuss further here but both (i) and (ii) can be – and have been – important in UK infrastructure industry history. Of these, (ii) could be highly relevant for water industry developments in the UK⁹.

⁸ Regulators do not, of course, buy water or any other infrastructure industry services directly. But, they can usefully be thought of as *either* procuring them on behalf of consumers (e.g. where the supplier is a monopolist like a vertically integrated water company) *or* at least setting the terms under which they are supplied to consumers. This procurement perspective, deriving from the work of Laffont and Tirole, underpins the use of ‘menu regulation’ first by Ofgem and now by Ofwat. See Laffont and Tirole (1993), Crouch (2006) and Stern (2006).

⁹ It is worth remembering that it was to protect the future shareholders in the newly privatised BT (and hence ensure a successful flotation at a reasonable initial share price) that was the single most important reason why the Thatcher Government accepted the need for an independent telecom regulator. For more on trust and trust perceptions in infrastructure industries, see Dassiou and Stern (2008).

2.2 Some Legal Points on Contracts and Regulation

The key reference in this area is the major 1999 book by Hugh Collins “Regulating Contracts”, the implications of which for infrastructure industry regulation are discussed at some length in Stern (2003)¹⁰.

A major theme of Collins work is that contracts should not be seen as primarily rigid control and sanctioning tools but as summarising commercial relationships and providing an ongoing basis for continued commercial collaboration. Hence, they are negotiated primarily as a basis of incorporating a long term commercial understanding and provide the basis for regular updating. Of course, the emphasis on contracts primarily embodying trust does not mean that they are irrelevant in providing sanctions if things go seriously wrong between the parties – either in legal or in economic terms. Collins provides good theoretical and practical evidence to support the notion of contracts as providing a reference point for working out solutions to problems or mistakes, even if they are not solutions obtained by legal process in the courts.¹¹ In addition, the ability to go to the courts also clearly provides some long-stop sanctions against gross misbehaviour or breach of trust.

The other major theme of Collins book that is relevant in the context of infrastructure regulation is that contracts can (and do) include public regulatory law elements. Conversely, utility regulatory agencies embody major elements both of public law (eg judicial review of actions by the regulator) together with major elements of private law.

The relevant set of contracts for infrastructure industries like water can include long-term contracts either:

- (a) between private companies; or
- (b) concession contracts between national or local governments or state-owned companies/agencies and private companies.

For infrastructure industries, the former can include network infrastructure access and use agreements (eg third party access arrangements and telecom interconnection agreements) as well as oil and gas production contracts, power purchase agreements, etc. The latter can include long-term concession or franchise contracts between state or local governments or state-owned companies/agencies and private companies (eg road and bridge concessions, electricity distribution franchises, cable television franchises, etc)¹².

¹⁰ See also Chris Bolt (2003) and (2007) who uses Collins’ analysis to discuss practical issues concerning the role of contracts in the railway industry and for the London Underground PPPs

¹¹ See Collins op cit Chapter 5.

¹² We use the terms *concession* or *franchise* contracts interchangeably to denote long-term (eg 20-year or longer) contracts with control of the assets of the business for the duration of the contract. The distinction between concession and franchise contracts is that, under concession contracts, the ownership of the assets always remains with the national or local government and reverts to them at the end of the concession, although the concession may be retendered for a fixed period or permanently. Franchise contracts can be a prelude to permanent privatisation.

TEXT BOX 1

Observed Types of Infrastructure Contracts Licences and Combinations

The practical consequence of the relationship between ‘contracts’ and ‘regulation’ is that it can in many cases be handled by a variety of legal instruments depending on the relevant legal, political and commercial circumstances - whatever the regulatory substance or content for the particular infrastructure industry.

In the UK and Australia, we typically observe infrastructure industries operating under regulatory ‘licences’ issued and enforced by the regulator. But, these are contract-type licences and not simple permits as are almost all other licences (e.g. business licences, driving licences, etc). In France and much of continental Europe as well as Latin America, we observe concession contracts rather than licences. In the US, we observe utilities operating under indefinite franchises under Federal and State regulators where the latter operate primarily under administrative law.

We also observe mixed systems. For instance, UK railway regulation involves a significant mixture of contracts and licences while the London Underground PPPs operate primarily by contracts. In developing countries, the regulatory law and licences can be written to mirror the terms of concession contracts so that the regulatory agency becomes a concession contract monitoring and enforcement agency (e.g. Uganda electricity distribution, Jamaican telecoms 1988-98). In some cases, we even observe concession contracts and licences for the same industry (e.g. Belize water and electricity distribution in Lesotho, Turkey and Uganda, among others). However, this is a difficult model to sustain, not least because the contracts and licences can diverge in their content unless they are monitored and enforced by a single agency – as happens in Uganda but not Belize.

Under this perspective, according to Collins, the key distinction between regulation by private law and regulation by agency or by government is that private law regulation “differs from other kinds of business regulation ... simply in the *generality of rules* which only become specific when applied by private ordering and adjudication” [my emphasis].¹³ In other words, it is not that contracts and private law cannot cover aspects of public policy and regulation; rather it is that it is difficult (and very costly) for them to do so when many parties are involved.

Private law is much less efficient at resolving problems when there are issues of general standard-setting, monitoring and enforcement. However, contracts can also be more rigid and harder to modify than licences, a concern expressed in Bolt (2007), where he takes a markedly less optimistic view on the equivalence of contracts to licences in their practical operation than in his 2003 Beesley Lecture. However, this may, at least in part, reflect particular issues with these contracts plus the relationship between the various parties to them. In general, these issues are likely to be more of a

¹³ Collins op cit, p. 59.

concern where there is relatively little trust and/or goodwill between the contracting parties – as was clearly the case with the London Underground contracts and the Ken Livingstone Mayoral administration.

If private law and contracts increasingly including public interest elements, should we also retain the view that utility (or other) regulation by agency is part of public law and outside the remit of private law? Collins argues convincingly that utility regulatory agencies embody major elements both of public law (eg judicial review of actions by the regulator) and major elements of private law. There is no question that regulatory agencies can impose particular obligations in contracts involving regulated companies so that the “commercial relations [of regulated companies] have been constituted within a confined space set by considerations of the public interest”¹⁴.

However, given the mixture of public and private law elements, it is not surprising that the boundary between contracts and regulation is far from clear-cut. There have been problems with this e.g. with the natural gas Network Code which operated as a set of contracts between the network operator (Transco) and the shippers. Codes and changes to the Code had to be approved by the regulator (Ofgem), but Ofgem could not directly initiate Code changes. In addition, appeals against Ofgem approved Code changes could only be made to the courts under judicial review. This was in contrast to Transco’s regulatory licence where Ofgem could propose licence changes but appeals on substance had to be made to the Competition Commission.

Summarising this sub-section, we find that the legal framework discussed above suggests that in utility service industries what we should *expect* to observe is that:

- (i) most transactions involving licensed utility companies are carried out on the basis of private law and contracts (which may include regulatory elements); *but that*
- (ii) contracts with small customers are likely to include requirements laid down by the regulator; *and that*
- (iii) general requirements, standards, codes and provisions are approved, monitored and enforced by the regulator under powers derived from general legislation.

This is what I would argue we observe, not just in the UK, but in the US, the EU and other OECD countries.

¹⁴ See Collins op cit, p. 307-8.

3. Historical and Contemporary Experience

In this section, I discuss the lessons for the relations between contracts and regulation from:

- (i) UK late 19th and early 20th century history with the development of the railways and electricity supply;
- (ii) The French water industry; and
- (iii) Concession contracts in developing countries.

I conclude with some short observations on the role of regulatory entities in helping resolve trust misperceptions between purchasing authorities and contractors.

3.1 UK Railways and Electricity Supply 1840-1948

The history of UK railway contracts and the failure to devise ways of reviewing and modifying them provides a cautionary lesson in what can go wrong. The railway regulatory commission put in place in 1873 (which continued in operation until 1955) must be a strong candidate for least effective regulator in UK history. With electricity, 50 years later, some of the same problems arose but less acutely. However, whereas the US found reasonably effective regulatory solutions to these problems in the 1920s and 1930s, the UK failed to do so until the 1980s.

In what follows, I discuss the railway example at some length and the electricity case in much shorter form.

3.1.1 UK Railways 1830 - 1947

Until their nationalisation in 1947, UK railways operated as private companies under franchise/concessions. They operated for their first 30-40 years under a standard model where the owners were granted a limited period franchise under a specific parliamentary act but without any external regulatory oversight. The acts provided a contract that was enforceable in the courts and specified the main conditions for the franchise.

This model originated with the 18th century arrangements for toll roads and, later, for canals. Typical conditions for these franchises were:

- A 21-year franchise (renewable by passing a new act);
- Dividend payout limitation of 10%;
- Toll rates specified in the Act.

This model worked adequately for infrastructure *facilities* in a world of low inflation but worked very badly indeed for the new nineteenth century infrastructure *industries*. The fundamental point was that the canal users were people who used their horses (or their own strength) to transport the barges along the canal. The contrast with the railways was huge. For the railways, the trains and engines were owned by the railway track-owners. In addition, inter-connection between lines was much more important – and required detailed harmonisation of track gauges, standards, signalling, etc. Finally,

there was no effective competition for rapid transport until the arrival of petrol driven vehicles after 1900. Hence, railways had enormous market power both nationally and locally.

The history of British railways is the story of how there was continued failure to provide adequate regulation of the railway franchise contracts in the sense of being able to review and revise them in the light of new information. The result of this was that the railway companies earned very large monopoly profits up to 1900 and increasingly lower profits - and with correspondingly declining investment thereafter. In consequence, there was probably little choice post 1945 other than to nationalise them. It was a classic regulatory failure.

A detailed account and analysis of this sad story is set out in Stern (2003) which draws very heavily on the account by Christopher Foster¹⁵. The underlying economic problems were:

- (i) Long franchises – much longer than 21 years – were necessary to allow the railway companies to operate post-construction and earn a reasonable rate of return;
- (ii) For the first 30-50 years, technical progress meant that there were strongly decreasing costs of running trains and railway systems. Thereafter, technical progress became progressively slower and the cost advantages of rail were rapidly eroded by technical progress in road transport.
- (iii) There were strong incentives on the railway companies to over-invest and limit competition. This led to serious national and regional monopoly problems.

A major incentive for the earliest railways was the construction of lower cost alternatives to compete with canals eg the 1830 Liverpool to Manchester railway competed against the Duke of Bridgewater's canals. Hence, in the absence of price regulation, railway companies set prices against what the market could bear i.e. the price of horse-drawn stagecoaches, carts, canal barges, etc. But, railway costs were much lower so that such prices allowed significant profits. Hence, by the 1850s, the only real threat to prices was the threat of new entry from competing lines but this threat was low, particularly as the system matured. This was primarily because the incentives for excess track expansion investment meant that, in most cases, new entrants faced the threat of a rates war that they would almost certainly lose – particularly when it was so difficult to obtain price comparisons. Hence revenue sharing, price collusion and merger dominated over competition. Where competition did exist, (eg London to Liverpool from steam ships), freight rates were lower, but competition was the exception rather than the rule, particularly when the railway companies vertically integrated through the purchase of canal and dock companies.

¹⁵ See Foster (1992), '*Privatization, Public Ownership and the Regulation of Natural Monopoly*'. Chapters 1 and 2 are the key part for this account.

If the weak price comparisons and an absence of effective price regulation allowed a bloated, high-cost and high-priced UK railway system in the nineteenth century, it also hastened its decline in the twentieth. When costs started rising sharply and inflation became more prevalent, there was no mechanism by which the higher wage and other costs could be passed through into higher rates so that railway companies share prices fell by 30 per cent between 1896 and 1911¹⁶. But, after 1900, there was growing and real competition – not from within the railways but from lorries, cars, buses, etc. Aside from any difference in operating costs, the absence of road pricing meant that railways found it increasingly difficult to compete because well over 50% of their costs were track-related.

In consequence, after 1920, railway companies found it virtually impossible to raise rates without lowering total receipts, primarily because of demand responses. The railway companies and shareholders that prospered in the nineteenth century because of cost advantages and an absence of regulation became progressively and rapidly squeezed in the twentieth century because of the absence of any regulatory agency to relate prices to costs as competition from other transport modes intensified. This profit squeeze was worsened by the problems of an over-extended and high-cost network.

The fundamental regulatory problem was that there were no adequate mechanisms to review and realign costs with prices. In particular, there were no standard accounting requirements on the railways and no information disclosure obligations. There was no accounting separation (let alone management separation) between track and train services and, of course, no separation of prices between network and services.

This lack of any information disclosure requirements was particularly damaging. This seems to have largely arisen because the price offered to each customer was considered as a separate (private) contract. There was no obligation on railway companies to publish any prices until the 1870s and this allowed prices to diverge very substantially from costs, not least because of railway companies' abuse of their market power in the railway freight and related markets. Indeed, as late as 1914, there were huge uncertainties as to what railway costs actually and consistent definition cost comparisons between companies were still virtually impossible.

¹⁶ See Foreman-Peck and Millward op cit, p 82.

TEXT BOX 2

Nineteenth Century UK Railway Regulation

By 1887, Great Northern railways had 13 million rates and North Western had 20 million and there was widespread price discrimination. Rates were particularly high where railways had merged with (or had no competition from) shipping or canals. In addition, there was widespread growth of costs from excessive investment and padding of capital employed – not least because it was for consumers to demonstrate via contract procedures in the courts that rate rises were unjustified. So long as the 10% dividend payout was unbreached, companies were at perfect liberty to raise rates¹.

The first attempt to provide effective regulation was in the 1844 Railways Act but, for various reasons, this was totally ineffective. The response to its failure, plus and the representations and continued pressures from freight users, was the establishment in 1873 of the Railways and Canals Commission. This ‘railway regulatory agency’ – the first independent national railways regulator - persisted in various guises until 1956.

It was decided to institute a commission because:

- Parliament could not provide a review body with continuity - and the threat of review by Parliament under the 1844 Act had demonstrably failed;
- the Board of Trade (the relevant Ministry) was rejected because it had insufficient judicial character; and
- the courts were rejected as they were deemed to have insufficient practical knowledge or administrative facility.

The 1873 commission did not resolve the regulatory problems because:

- (a) there were still very limited obligations on companies over publishing rates and no common accountancy requirements or other informational obligations;
- (b) the onus of proof remained on consumers to demonstrate why general or specific rate increases should not be allowed; and
- (c) the commission (and its successors) only considered rates on individual lines not averages or indices of rates.

These failures led 1894 to the reversal of the onus of proof for rate rises so that, after 1894, the railway companies had to demonstrate to the Commission why they should be able to raise rates. This looks much more like a modern regulatory regime – except that it still only applied to individual rates, not to rate baskets. Unfortunately, the impact of the 1894 revised arrangements was to ossify rates and to increase the incentives for collusion and the merger of rail companies.

This was the regulatory position at the time when the government had loaded the railways with significant numbers of public service obligations, when railway technical progress had slowed dramatically and when competition from road transport was beginning to become serious.

The key point to emphasise is that all the attempts at establishing regulatory agencies for the UK railways in the nineteenth century were failures of regulatory design. Their designers recognised the inherent problems of relying solely on long duration franchise contracts and private law remedies for railway regulation. In particular, they recognised the inability to review and revise the prices in the initial contracts or to impose general conditions without the assistance of an external independent regulatory body.

It is not that contracts and the private law provisions would have done better – for most of the period, that was the system effectively in place. Rather, it is because the regulatory regime could and should have been better designed. In particular, the UK government should have been more thorough-going over imposing proper and regular regulatory review by an independent agency rather than making the concessions it did to the supposed sanctity of contracts. This would have required proper information disclosure on prices and a prohibition on undue discrimination and other predatory practices.

Ironically, imposing more thorough-going information disclosure and regulatory review might well have allowed the survival of contracts eg between railway companies and large freight customers.

3.1.1 UK Electricity 1880-1948

For electricity, similar sorts of issue arose over the 1880-1940 period as with railways 50 years before. However, some lessons had been learned and the system worked with moderate rather than extreme lack of success¹⁷.

The first regulatory agency, the Electricity Commissioners, were established in 1919 i.e. about 40 years after the first local electricity supply companies started operation. After 1926, they operated jointly with the (state-owned) Central Electricity Board enforcing standardisation via the construction of a National Grid. The construction of the Grid was based on early standardisation of the voltage at 132 Kv.

This is in striking contrast to the problems of achieving standardisation of distribution level voltage and frequency – or even between AC and DC – at regional and local level. Standardisation of those was only achieved after nationalisation in the 1940s. That delay (which imposed significant costs e.g. on electricity appliance users and manufacturers) represents a major regulatory failure arising from the inability of the electricity regulatory agency to intervene in or renegotiate franchise contracts.

At the retail level, the UK electricity franchise contracts did not allow for renegotiation of maximum prices. Pre-1914, low inflation and rapid technical progress meant that there was no need for price increases. After 1919, franchise holders could appeal to the Electricity Commissioners for price increases to reflect higher costs but all other terms of the franchise contract were left unaffected. In general, the Commissioners'

¹⁷ See Stern (2003) for a much fuller account. That draws heavily on Byatt (1979) and Hannah (1979).

powers were heavily qualified and they had no authority to make price increases or other approvals (eg sanction for new generating plant) conditional on other actions.

In contrast to the UK position where franchisee's rights were heavily protected, US electricity and other franchise contracts often made *explicit provision for renegotiation in response to changes in circumstances*, subject to arbitration or reference to an independent committee. These independent committees, which developed from around 1910, could take the responsibility for monitoring service quality. These arbitration or review committees gradually evolved in the 1920s and 30s into state Public Utility Commissions with substantial power to extract concessions from the utility as a condition of maintaining their franchise without competitive entry¹⁸.

The absence of any explicit contract review powers in the UK meant that there was no equivalent provision for explicit franchise review to change the requirements on franchise holders or even to trade changes in return for concessions eg on price rises. This, together with the continued monopoly status of mainly local, vertically integrated, electricity companies was a major cause of the pre-nationalisation stagnation and low cost efficiency at the retail level

3.2 French Water Industry and Other French Infrastructure Contracts and their Regulation

We discuss below in some detail the 'regulation by contract' arrangements that have developed in France and how they have, in many respects, become increasingly similar to UK infrastructure regulation. This is followed by a very short discussion of some relevant contract regulation and renegotiation issues for toll roads.

3.2.1 French Water Industry Contracts and their Regulation

The French water supply industry is organised at a local level.

In the nineteenth century, it was primarily organised via local monopoly private concession contracts that seem to be very similar to UK pre-1914 concessions for railways and electricity. Disputes (primarily between Municipalities and concession holders) were adjudicated by the Conseil d'Etat. These were full concessions where the concessionaire was responsible for investment as well as operation¹⁹. However, connection rates were very low (around 2% in 1900). After 1900, public management via the Régie system grew substantially and this period showed huge increases in connection rates, which rose to 65% by 1950 and 90% by 1970²⁰.

In France, unlike in other countries, private management of water companies never died out and the nineteenth century concessions mutated into lease contracts (affermages). However, under these lease contracts, the municipality had the primary responsibility for investment. Affermages have been growing relative to régies since 1950, particularly since 1970. In addition, in recent years, there has been considerable

¹⁸ See Newbery (1999), p. 23 for a description of the evolution of US municipal regulation.

¹⁹ Sewerage appears to be separately organised and handled by different companies/entities from water supply.

²⁰ This account, and much of what follows, is drawn from Pezon (2003).

growth in 'pure' concessions where the concessionaire is responsible for investment and its finance as well as for operating costs. However, the assets always remain in public ownership so that the ownership of the assets reverts to the municipality at the end of the concession – following which it is normally retendered. There are also some intermediate management and delegated management contracts.

The key features of the main types of contract and their incidence are as follows²¹:

- (i) *Direct management contracts*
Under these *régie* arrangements, the public authority carries out all water supply functions.

In 2001, *régies* accounted for 31% of all French water supply contracts but, primarily for small communities.

- (ii) *Delegated and intermediate management contracts.*
Delegated 'gérance' contracts provide simple management contracts for the entire service in return for a fee. Intermediate management contracts are the same except that they give a small performance related reward. They are short term contracts with little or no risk transfer to the operating companies.

These two types of contract accounted for 7% of all French water supply contracts in 2001.

- (iii) *Lease contracts*
Affermage (lease) contracts provide medium term contracts (e.g. 7-12 years) where the investor is compensated via customer receipts and is responsible for maintenance of the network and minor investments but not for major investments. Hence, the concessionaire takes on operating risks but not investment risks which remain with the Municipality.

These contracts accounted for 57% of all French water supply contracts in 2001.

- (iv) *Concession contracts*
These are operated under long term contracts (e.g. 15-20 years) and the operator undertakes and finances a large part of investments over the duration of the contract. These contracts involve a substantial degree of risk transfer. Operators have considerable decision rights and significant incentives to cut costs under these contracts.

In 2001, these contracts accounted for 5% of all French water supply contracts in 2001. However, they have become much more important than this suggests as many large towns and water supply areas have converted to them in the last 20 years or so. In 1995, they covered

²¹ See Saussier et al (2006) and Menard and Saussier (2003).

about 15% of the population and were the dominant type of contract in the main cities. This figure may well have increased since then.

The legal framework under which the French water sector operates has three main laws: firstly, on water quality standards; secondly, laws on transparent operation of water companies (including, since 1993, a law requiring compulsory auction tender of new lease and concession contracts, at least of their first stage – only with no obligation to accept the lowest bid); and, thirdly, environmental laws. All water companies, public and private, are co-ordinated and partially supervised by regional agencies (Agences de l'Eau). In addition, all lease and concession contracts (which account for over 60% of contracts around 80% of customers) fall under the purview of the Conseil d'État, which increasingly acts in similar ways to a 'standard' infrastructure regulator.

The choice of which type of contract is chosen by the relevant authority is not random nor by any means wholly political. Menard and Saussier (2003) show that, controlling for other relevant factors, areas were more likely to choose direct public management where more upstream investment was needed, particularly where more specialist water treatment investment was needed. The larger the population – and the more seasonal population variability, the more likely were authorities to delegate to a lease or concession operator.

Concession contracts perform two functions in a single document. A typical concession document will transfer *operating rights* to the private operator while at the same time also imposing *regulatory obligations* on the operator. Under the first function, the contract will transfer many of the property rights that would normally be associated with full ownership of the assets. For example, most concession contracts provide private operators with full management discretion in deciding how to operate existing assets and what new investments should be made²². Under the second function, the concession contract imposes regulatory standards, targets and obligations on the operator with respect to maximum tariff levels, required quality of service standards, obligations to serve new and existing customers and procedures for the transfer and disposal of assets.

The municipality is, in effect, both a buyer of services and a *de facto* first level regulator. This does not mean that the specific terms and conditions of the concession contract are developed *de novo* by each municipality. Most French municipalities still rely to a considerable extent on “model” concession contracts developed by central government municipality or an association of French municipalities²³.

Because there is no formally designated regulator, the French model is sometimes described as “regulation without a regulator.” Even though there is no formally designated water regulator, this does not mean that the two parties to the contract—the municipality and the private operator—have total freedom in designing the contract.

²² For affermage contracts, the decision on whether or not to build these investments rests with the local authority, but there seems to be surprisingly little disputes on this. See Pezon (2003)

²³ Before 1982, nationally standardised contracts were required but, since then, local authorities can choose their own contractual terms. However, perhaps not surprisingly, they seem to differ little between areas.

Just as US regulators are constrained by a body of law that interprets the meaning of “just and reasonable” and “not unduly discriminatory,” French municipalities and water companies are constrained by several general legal doctrines that have been developed or accepted by the Conseil d’État. These include an operator’s right to receive tariff adjustments for adverse government action (*fait du prince*), hardship (*imprévision*) and unexpected constraints (*sujétions imprévues*).

The Conseil d’État functions as a “quasi regulator” or “super regulator,” even though it is a court, because it performs at least one of the traditional functions of a regulator: it resolves disputes between customers (the municipalities) and suppliers (the private operators).²⁴ Further, over the last 20 years, the Conseil d’État has increasingly taken on cases where *consumers* have raised complaints against the municipality and/or the lease-holder/concessionaire- something it was not prepared to do before. However, this system seems not to have developed as far for consumer interests regarding drinking water as it has for general water supplies²⁵.

In general, from 1920 onwards, the Conseil d’État has gradually but continuously increased the degree to which it has been prepared to modify water supply contracts following court review of a complaint. This is something that UK infrastructure regulation never succeeded in achieving until the development of independent regulators with the 1980s privatisations.

There is some evidence on the relative performance of the different types of French water governance and, in particular, of full concessions. However, when looking at this evidence, it needs to be remembered that:

- (i) The water concessions and leases are local monopolies with at least business integration between water supply and network services;
- (ii) Three major operators account for over 90% of the market share of the industry so that incumbents have a considerable advantage in monopoly franchise contract renewals relative to competitors. In 2001, only 11% of renewed contracts resulted in a change of operator²⁶; and
- (iii) It seems that there is still considerable public funding by subsidy (national and local) of the French water system and it is unclear whether or not this varies between types of operator.

The evidence on the relative performance of different types of French water contract (which needs to be interpreted in the light of the comments above) is set out in Annex 2.

²⁴ See Frilet (2004) and Pezon (2003).

²⁵ See Pezon (2004).

²⁶ See Chong, Huet and Saussier (2006).

3.2.2. *Other French Infrastructure Contracts: Toll Roads, Renegotiation and Institutional Quality*

Stéphane Saussier and his research team have published a number of important papers on contracts, their properties and determinants, both theoretical and empirical. Some of these were discussed above in the context of French water arrangements. Others include papers on French (and British) bus contracts, EU farm contracts, etc. However, the work I wish to highlight here is a 2006 paper by Athias and Saussier on toll road concession contracts²⁷. This uses the economic theory of incomplete contracts, which is combined with transaction cost economic theory. However, the most significant feature is that they can test the predictions of their theories against an extraordinarily appropriate and rich data set.

The Athias-Saussier paper is important, primarily because – very unusually – they had access to the full details of 71 toll road concession contracts, 45 original contracts and 26 renegotiated, ‘supplemental’ contracts. All were contracts with a French contractor. About 75% of these contracts were in France and the rest were spread across a range of developed and developing countries. These contracts are very long term (typically 30 years or longer) and there were major uncertainties, most obviously on traffic flows over the concession period.

The importance of the paper is that it shows that for these contracts:

- The road concession contracts were much more flexible than the authors had expected in terms of including built-in or potential price renegotiation once the road had been built. Of their 71 contracts, 18% were fully flexible or very flexible in terms of expecting price renegotiation and 28% had considerable in-built price flexibility and scope for renegotiation;
- Higher uncertainty (as measured by uncertainty regarding predicted traffic flows) significantly increased the probability of having a more flexible contract;
- The longer were duration contracts the more flexible they were in terms of price renegotiation;
- Repeat contracts with the same commissioning authority were more flexible; and, ***most importantly***
- Stronger country regulatory quality (intended to capture the reliability of contract enforcement in each country) was found to ***increase*** the flexibility of the contracts.

This last result is very important and shows how, in practice, a pre-existing ‘regulatory’ facility to review and modify infrastructure contracts allows simpler and more flexible contracts. The estimated effect was not only found – and found strongly and highly significantly in all their estimated equations - but the finding was also counter to the initial expectations of the authors and to most of the economic theory of contracts and negotiation.

²⁷ Athias and Saussier (2006)

From bargaining theory, Athias and Saussier predicted that stronger institutional quality would lead to *more rigid* contracts (e.g because the operating environment was less uncertain); although, at one point in the paper, they also recognized that stronger institutional quality could potentially reduce the costs of renegotiation for any given degree of ‘maladaptation’ for either party. However, the second effect clearly dominated in the empirical work.

Athias and Saussier interpreted their results as evidence that strong institutions provide ‘an important impediment’ to opportunistic behaviour by either purchaser or contractor. That may be a factor. I would also like to emphasise the role that stronger political and legal institutions have in encouraging simpler and better quality contracts, not least by providing external review. This is something that is also shown by developing country experience, which is discussed in the next section.

3.3 Evidence from Developing Countries on Concession Contract-Regulation Synergies

There is a huge body of empirical work on developing country infrastructure concession contracts and on the effectiveness of regulation. In what follows, I will briefly summarise the key results of the most relevant work for this survey.

The work on which I will focus is by J. Luis Guasch and associates at the World Bank. The first set of this concerns data set of over 1,000 infrastructure concession contracts established in Latin America and the Caribbean between 1982 and 2000. The second is a more recent study of Latin American and Caribbean electricity distribution and the impact on performance of regulation and the introduction of private capital over the 1995-2005 period.

The first part, on the fate of Latin America and the Caribbean concession contracts concluded in the 1980s and 1990s is most noted for its finding of a very high – and typically very early - renegotiation rate for these contracts²⁸. Excluding telecoms (where renegotiation was rare), over 40% of these contracts were renegotiated at least once. Electricity renegotiation rates were also relatively low (10%), but the renegotiation rates for transportation (mainly toll roads) was high (at 55%) and, for water and sewerage concessions, it was 74%. In addition, the time before renegotiation was very low.

The contracts were very largely long-term concession contracts but the average time before renegotiation on toll road contracts was 3 years and, for water and sewerage contracts, only 1.6 years. This last is in spite of (or, in some cases, because) the fact that over 95% of the water concessions were awarded by competitive tender. Of the renegotiations, around 25% were initiated by the government, about 60-65% by the operator and 10-15% by both parties²⁹.

Worldwide, developing country water and electricity concession contracts have high failure rates. These represent contracts where renegotiation was either not possible or

²⁸ See Guasch (2004).

²⁹ Guasch (2004), Chapter 1.

failed. Across all developing countries, 13% of all 1990-2005 electricity distribution concessions were no longer operational – 47% in Sub-Saharan Africa and over twice the rate of generation contracts. In water and sewerage, 11% of *projects* were cancelled or in distress but these accounted for over 34% of the *value* of investment commitments. Hence, there were very high failure rates for the large, full concession contracts which, for water, seem largely to have disappeared apart from the most favourable country environments. Instead, private investment in water in developing countries has focused in recent years almost exclusively on treatment plants and short-term management contracts – and similarly for electricity distribution³⁰.

In many cases, the need for major renegotiation and the high rates of cancellation for concession contracts involving investment commitments represent major *regulatory* failures. These are sometimes failures to establish effective regulatory regimes (as in 19th century Britain) and sometimes an unwillingness of governments to give regulators genuine independence – particularly if significant tariff increases were necessary and/or at times of national economic difficulty.

3.3.1 The Impact of Regulation on Concession Contract Renegotiation Rates on Latin American and Caribbean Water and Transport Concession Contracts 1982-2000

Given the potential ambiguity of the term, it is worth setting out in full the definition of a ‘renegotiation’ as given by Guasch. This is as follows:

“Renegotiation has occurred if a concession contract underwent a significant change or amendment not envisioned or driven by stated contingencies in any of the following areas: tariffs, investment plans and levels, exclusivity rights, guarantees, lump-sum payments or annual fees, coverage targets, service standards and concession periods. Standard scheduled tariff adjustments and periodic tariff reviews are not considered renegotiations.” (Guasch (2004), p.12.)

This looks unproblematic but, of course, contracts can vary in the degree to which contract terms are rigid or flexible on these issues. Indeed, as we have seen on French toll road contracts, the contracts do vary quite considerably on the degree to which these issues are pre-specified and fixed in the contracts. I will return to this below when discussing the apparently strong impact of regulation on contract renegotiation rates for this Latin American sample.

In two very influential papers, Guasch and his co-authors investigated the determinants of contract renegotiation³¹. Their sample was of 307 water and toll road projects over 12 years in five Latin American countries (Argentina, Brazil, Chile, Colombia and Mexico). The first paper dealt with contractor firm initiated renegotiations and the second with government initiated renegotiations.

³⁰ See Marin and Izaguirre (2006) for developing country water and sewerage experience and Tenenbaum and Izaguirre (2007) for developing country electricity experience.

³¹ Guasch, Laffont and Straub (2003) and Guasch, Laffont and Straub (2007). The empirical results of the two papers are summarised in Guasch and Straub (2006)

The main result was that, in both firm-led and government-led renegotiations, the presence of a pre-existing regulator before the contract was concluded *significantly reduced the probability of a renegotiation* (where renegotiations were defined as above). The effect was about twice as large for firm initiated renegotiations. Interestingly, for government initiated renegotiations, the beneficial impact of the regulator was reduced by about one-third if the regulator was part of a government ministry.

These results are important and potentially powerful. In their first 2003 paper on firm-led renegotiations, the reasons given for the renegotiating reducing impact of a regulator were as follows³²:

- Better designed regulation in place “... will reduce the scope for obvious mistakes and lessen the need for later disruptive modifications.... *[unexpected contingencies can] be dealt with through a normal revision process inside the existing regulatory framework*”. [My emphasis]
- Effective regulation allows, better, simpler and more transparent concession contracts with less scope for opportunistic behavior (“gaming”) by either party.
- The existence of regulatory bodies means that the specific contract clauses are better tailored to the specific circumstances and context of the concession.

The paper emphasizes the last of these three effects³³. My view is that the first two are the key ones. (These two are, of course, closely related).

However, the evidence presented above does need to be interpreted with a degree of caution. This is for three reasons:

- (a) *It is not clear what precisely Guasch and colleagues mean by a ‘regulator’.*
In some cases, it will be a genuinely independent infrastructure regulator (like Ofgem or Ofwat). In other cases, we know that it is a Ministry regulator and it may be a small, provincial regulator with no little or no effective independence. In still other cases, particularly for toll roads, it will be a concession contract monitoring and enforcement agency.
- (b) *Contracts will vary in how much ‘regulation’ and contract modification is done under the terms of the contract and how much by the regulator.*
We have seen this with the French toll road contracts. Here, more will presumably left to the regulator under the simpler contracts.
- (c) *What is included in the contract and what left to the regulator will affect whether or not a significant contract change is classified as a ‘renegotiation’*

³² Guasch, Laffont and Straub (2003), pp 26-30.

³³ They do so because of sensitivity testing on the econometric specification where the regulatory variable is (somewhat doubtfully) included at both stages of a two-stage estimation.

If the contract is simple and leaves more to the regulator, the resulting changes probably will not be classified as a ‘renegotiation’. However, for a different contract which specifies reviews and modifications inside the contract, the same changes may well be classified as a ‘renegotiation’.

In conclusion, the results of this work provide considerable empirical support to the hypothesis that regulation assists in the sustainability of concession contracts through providing for their orderly modification in the face of unforeseen and/or unexpected changes in circumstances. However, the results, although very persuasive, are not cut-and-dried; their reliability will depend on the quality and consistency of the handling of the source data – which we cannot know.

3.3.2. *Impact of Regulation and Quality of Regulatory Governance on Electricity Distribution in Developing Countries*

There have been a number of papers on the impact of regulation on telecom performance in developing as well as developed countries. Recent ones (e.g. Gutierrez (2003) have focused on not just whether the *existence* of a regulator has an impact but, in addition, on whether the *quality of regulatory governance* (e.g. licence fee funding, transparency, accountability via appeals, etc) significantly improves performance. For electricity, Cubbin and Stern (2006) explore this issue for investment in generation in developing countries. Now, a 2008 paper by Andres, Guasch and Azumendi (AGA) investigates the impact of a regulator and of the quality of regulation on a sample of 216 Latin American and Caribbean electricity distribution companies from countries that had *either* had a change in ownership *and/or* introduced a regulatory agency over the period 1995-2005.

The relevance of the AGA paper is, firstly, that this is a very comprehensive study of the impact of regulation on electricity – and the distribution network-retail supply combination that is also common in water supply. Secondly, the change in ownership is almost always to involve private capital but it is clear that a large percentage of the private sector participation for these electricity distribution companies was via various types of concession contract (leasing-affermages, franchises and pure concessions). In 1993, only 3% of Latin American and Caribbean connections were supplied by other than by a publicly owned and managed company. By 2005, this had risen to 65%. Similarly all the countries in the study introduced an electricity/energy regulatory agency during the 1990s – except for Chile which had done so in 1978.

The measures of performance for the distribution companies include residential connection rate per employee, distribution losses, coverage rate, energy sold per connection, duration and frequency of interruptions, Opex per connection and per megawatt hour sold (i.e. average tariff), average industrial and average industry tariff and the utilities’ cost recovery rates.

Summarising the results, the main findings were:

- (i) private sector participation (mainly by concession contracts) was strongly associated with improved performance on virtually all of the performance indicators;

- (ii) the existence of a regulatory agency was strongly associated with further improved performance on virtually all of the performance indicators;
- (iii) the longer the time that the regulator had been in place, the more performance appeared to improve; and
- (iv) increases in the autonomy and effectiveness as measured by the various (detailed) components of regulatory governance were also strongly associated with improvements in performance.

The authors conclude by pointing out, firstly, that regulators improved performance for these utilities, whatever their ownership – including the (small numbers of) state-owned electricity distribution utilities; and, secondly, that “... the highest achievements are reached with the combination of private sector participation regulated through a regulatory agency that exhibits good governance.” (AGA (2008), p.25.

Since most of the distribution companies in the sample are concessions, the results from the AGA paper again show how regulation can and does work effectively in combination with concession contracts significantly to improve performance.

3.4 Trust and Trust Misperceptions: The Role of External Regulators

This paper has emphasized the role that regulatory agencies *can potentially* play in maintaining the efficiency of and price-cost alignment in network infrastructure industries. It has, in addition, discussed the role that regulators *can potentially* play in supporting the role of private finance, enabling simpler contracts and resolving contract misunderstandings.

Of course, regulators do not always behave in ways that achieve these objectives. They may fail to do so or they may not be allowed to do so by the government. *Regulatory failure* is far from unknown, in developed countries as well as in developing countries. In the latter, the degree of success of independent regulators in achieving these objectives has been limited if not disappointing. Hence, the search for mechanisms that will reinforce the incentives on governments and regulators to behave in supportive ways (e.g. World Bank regulatory risk guarantees³⁴).

In this paper (and in previous papers), I have taken the view that the best regulatory regime is one of ‘bounded and accountable discretion’. Hence, I am profoundly skeptical about the value – or longer run viability – of rigid contracts and regulators with little or no discretion beyond enforcing infrastructure contracts.

³⁴ World Bank Partial Risk Guarantees protect the investor against regulatory misbehaviour by the regulator or government in the country where the investment is made. This is done by buying insurance from the World Bank under which the government of the country reimburses the World Bank if the guarantee is called. They typically operate for 5-7 years e.g. until after the first main regulatory review. The best known examples are for Romanian and Ugandan electricity distribution concessions.

However, the opposite view has been argued by Pablo Spiller who specifically supports rigid contracts and the strong limitation of regulatory discretion, if not its elimination. Spiller, whose work has been heavily influenced by experience in Argentina and other Latin American countries, emphasizes the problems of (a) governmental opportunism and (b) third party opportunism³⁵. He sees the former as the major problem in developing countries, particularly those with weak legal institutions while the second is an issue for democratic and developed countries, including the US. His response is to argue for rigid contracts and minimum discretion for regulators³⁶.

The underlying issue in this debate is the notion of *trust* and the degree of trust that contractors in concession contracts can have in purchasers and regulators. Spiller and I agree that, in many circumstances – and particularly for new types of projects, new countries, newly regulated industries and new regulators - the degree of trust by the contracting firm is likely to be limited.

This perspective was set out in Table 1 on pp 4-5. However, that table was set out on the basis that an external regulator could help align trust perceptions e.g. through dispute resolution methods, periodic and emergency reviews, etc. Of course, the fact that it *may* be able to do so does not necessarily mean that it *can and will* do so. Unresolvable trust misperceptions were crucial for the failure of the LUL Metronet PPP, in spite of the best efforts of the PPP Arbiter. Similarly, ORR was unable/not allowed to provide the necessary financial and other support for Railtrack to continue in private ownership, albeit in a flawed regulatory and policy framework.

There are many other examples from other countries, particularly from developing countries, where trust misperceptions could not be resolved. Typically these arise because of flawed regulatory and/or legal frameworks but also because of governmental opportunism. However, where regulators are *effective, efficient and work well*, they can make a major contribution to aligning trust perceptions between buyers and sellers. This is the main theme of a recent theoretical paper by Dassiou and Stern³⁷.

To show the difference in the two views it may be helpful to consider the example of the 2003 collapse of the collapse of a water concession contract in Atlanta, Georgia in 2003.

The Atlanta Water example is set out in Spiller (2008). It is summarised in the Text Box below.

³⁵ See Levy and Spiller (1994) for the classic paper on infrastructure industries, regulation and government opportunism and Spiller (2008) for a recent paper on third party opportunism.

³⁶ Levy and Spiller's paper at one point identifies how to constrain regulatory discretion as *the* main problem in regulatory governance.

³⁷ See Dassiou and Stern (2007). This is a relatively technical, game theoretic paper. A more approachable exposition of the concepts is in Stern (2008).

TEXT BOX 3

City of Atlanta Water Lease Contract Collapse 2003

The facts are as follows:

- (i) In 1999, the City of Atlanta negotiated a 22-year management and operation contract (i.e. a lease/affermage type contract) with United Water.
- (ii) Soon after the contract had been agreed, United Water claimed that the baseline data on which it had bid were inaccurate so that the target and fees in the original contract meant that it would lose \$10 million per year on a \$21 million per year contract to reach the standards agreed in the contract.
- (iii) The City decided not to renegotiate the contract, but to take it back into public management at a cost of \$40 million per year. Terminating the contract in this way was agreed “amicably” by both parties.

Underneath these bald facts, it is also the case that during the discussions before termination, there had been a series of corruption allegations, firstly, over an agreement to grant United Water \$4 million per year following United Water’s request for compensation for works not included in the original contract; and, secondly allegations that the Mayor of Atlanta had business relations with a competing operator.

(See Spiller (2008), pp 26 - 27 for the full exposition.)

Spiller’s interpretation of this is set out clearly in the following words:

“The Atlanta case is an example of a contract falling apart ... [because of] the inability of the parties to draft and implement contracts with sufficient flexibility that can adapt to uncertain operating circumstances. Instead, the parties entered into a highly inflexible contract, forcing them to renegotiate or terminate. The City, however, was unwilling to pay the political price of renegotiation. *The main thrust of this paper is that contract inflexibility is inherent to public contracts and that, facing the potential for third party opportunism, large shocks may trigger termination and/or litigation rather than renegotiation.*” [Spiller (2008), p27. My emphasis.]

Yes, well, maybe.... The key point that I note is that seems not to have been any external and independent regulatory entity to whom one or other of the parties could have appealed for a review and determination. If there had been such a body – and it was effective and genuinely independent, the first corruption allegation could have been avoided, and the second would not have been a major issue.

Most importantly, I would argue that the contract could probably have been successfully rewritten and continued without major political or economic cost. Indeed, the existence of an effective external regulatory entity would, I suggest, have precisely allowed the parties “to draft and implement contracts with sufficient flexibility that can adapt to uncertain operating circumstances”. In other words, the regulator could have

realigned the trust misperceptions that could and did arise once the newly appointed operator established once it had taken management control of the base assets.

There are many similar examples of the role of external entities in helping align – and realign trust perceptions in this area. One of the most fascinating is the saving from termination of the first-ever airport concession contract in Cambodia. Here again, both parties were happy to see the contract fail. However, in this case, an external entity brokered a renegotiated contract which has provided continued and substantial benefits both to the Government and citizens of Cambodia and to the concession holding company. It is difficult to imagine a more difficult set of circumstances, but, as set out in de Brux (2008), it seems to have worked amazingly well.

4. Conclusions

The key conclusions of this paper can be summarised briefly below.

- 1) Most elements of the supply of infrastructure industry services (like water, gas and telecoms) are very largely organised via a set of contracts, including long-term contracts. However, external regulation (eg. by an independent regulatory agency plays a crucial role in sustaining these contracts). That role includes:
 - a. Common clauses in contracts with final consumers e.g. on quality of service, complaints, etc. and
 - b. Network access terms and prices.
- 2) UK-style regulatory licences are essentially complex contracts and not just simple permits. UK regulators operate under a mixture of public and private law under which they can impose common accounting and business standards as well as allowing them to review and modify the licences (subject to due process).
- 3) In regulatory terms, concession contracts and licences are essentially very similar, but with the exception that concession contracts include ownership elements and hence are contracts between a company and a government that involve asset and liability ownership issues during the life of the contract and on its conclusion. This implies that:
 - a. Effective external and independent regulatory entities are just as important for concession contract regimes as they are for licence or infinite franchise regimes (viz. the failure of 19th century UK railway regulation, successes and failures of recent Latin American infrastructure concession contracts). Regulation and contracts are complements not substitutes.
 - b. Regulatory provisions can be set out in various types of legal instrument. They can be set out in licences (as in the UK and Australia), in concession contracts (as in France and many other Continental European and developing countries) or in both (as in UK railways, Belize water, Turkish electricity).
 - c. Effective regulation (including agreed contract review and modification) in concession contract regimes can be done by specialised courts (viz. French water concessions). It can also be done by regulators acting as contract review agencies (viz. Ugandan electricity distribution) or by specialist concession contract monitoring and enforcement agencies (viz. Jamaican telecoms pre-1988 and many Latin American and other developing countries).
 - d. To a considerable degree, it is a matter of choice whether and how far infrastructure industry arrangements are best handled by contracts or by licences. In the UK, railway regulation involves large elements of explicit contracts and the London Underground PPP plus Arbiter model was established as a relatively pure contract model.

- 4) Effective external, independent regulators, operating under clear and transparent procedures and legal ‘due process’, are crucial for successfully addressing the issue of uncertainty with large-scale, sunk network assets. They can help successfully address the problem that long-term contracts are inevitably incomplete. They thereby sustain the operations of and private investment (or private finance of investment) in infrastructure industries like water (viz. post-1980 UK regulation – unlike pre-1945 regulation, French water, Latin American electricity distribution concessions, Cambodian airport concession, etc.).
- 5) Regulatory agencies have a crucial role in defining effective business standards in licences/contracts and, in particular, common and well-founded regulatory accounting standards. These are essential if monopoly facilities (like water distribution networks) are *both* to earn a reasonable rate of return sufficient to finance new investment *and* to avoid them exploiting consumers by earning substantial and economically unnecessary monopoly profits (viz. UK railway industry regulatory failure relative to post-1980 regulatory success.)
- 6) Effective, independent regulatory agencies are crucial for creating trust between supplier companies, purchasers (final consumers and concession letting entities), shareholders and lenders – and governments - in new circumstances. This includes new industry/market structures, new regulations, changes in degree of commercialisation and/or role of private finance).
 - a. They can also be crucial in maintaining and recreating trust when this is threatened by sustainability problems, either from within the industry (e.g seriously inaccurate demand or cost forecasts) or from external shocks (viz. much developing country experience, Atlanta water concession failure.)

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Annex 1

Commercialization Criteria for Publicly Owned Utility Service Industries and Enterprises

The relevant company or enterprise should:

- Have corporatized status and not operate as a government department.
- Be governed by a board with a significant number of non-executive board members who should not be government officials.
- Be in full compliance with internationally accepted accounting standards, including its own balance sheet.
- Pay taxes at the same rate as other companies or enterprises.
- Borrow at market-based interest rates.
- Earn a commercial rate of return on capital or equity.
- Have the autonomy to borrow within limits set by the board and regulator.
- Have the autonomy to procure equipment, consultancy, and other services.
- Have the autonomy to hire and fire staff.
- Adopt commercial salaries and employment conditions (including total level of employees).
- Raise financing from capital market sources rather than from low-cost government fiscal sources.

Source: Brown, Stern & Tenenbaum (2006), p 61

Annex 2

Relative Performance of the French Water Governance Arrangements

So, how well do lease/concession contracts perform? I am not going to answer this relative to other countries as such international comparisons are very difficult and outside the scope of this paper. There is, however, quite a lot of evidence on the relative performance of regies, leases and concessions. The main source for this is the work by Stephane Saussier and associates using a 2001 data set of 5,000 local authorities.

Before discussing the main results, it is important to emphasise that the degree of competition in the French water supply operator market is limited. Three major operators account for over 90% of the market share of the industry. In addition, incumbents have a considerable advantage in monopoly franchise contract renewals relative to competitors. Hence, in 2001, only 11% of renewed contracts resulted in a change of operator³⁸.

The main performance results from the 2001 sample are³⁹:

- Total water prices and operator distribution prices were higher on average for concessions and lease contracts than for publicly managed water companies but, particularly for concession contracts, declined as the time to contract renewal fell.
- Taking account of the technical and economic factors that lead areas to choose between concessions, leases and public management reduced the average price differential by about 60%
- For all types of governance, total water prices and operator distribution prices were both strongly related to underlying cost factors (water treatment costs, % of underground water).
- There was no evidence that more competition between private operators in any region helped restrain prices. However, competition from public managed water was important. The larger the share of publicly owned water companies in any region, the lower the prices in contracts – particularly of full concession contracts.

These results are interesting but it seems that there is still considerable public funding by subsidy (national and local) of the French water system and it is unclear whether or not this varies between types of operator.

³⁸ See Chong, Huet and Saussier (2006).

³⁹ See Chong, Huet and Saussier (2006) as well as Chong, Huet, Saussier and Steiner (2006).

REFERENCES

- Andres, L., Guasch, J.L. and Azumendi, S. L., (2008), 'Regulatory Governance and Sector Performance: Methodology and Evaluation for Electricity Distribution in Latin America', *World Bank Policy Research Working Paper No.4494*.
- Athias, L. and Saussier, S. (2006), 'Contractual Design of Toll Adjustment Provisions in Infrastructure Contracts', Atom-U, Paris-Sorbonne,
- Bolt, C. (2003), 'Regulating the London Underground, Beesley Lecture, www.ppparbiter.org.uk
- Bolt, C. (2007), 'Regulating by Contract and by Licence -- The Relationship between Regulatory Form and its Effectiveness', CRI Bath and www.ppparbiter.org.uk
- Brown, A., Stern, J. and Tenebaum, B., (2006), "Evaluating Infrastructure Regulatory Systems", The World Bank.
- Byatt, I.C.R., (1979), "The British Electrical Industry 1875-1914". Oxford. The Clarendon Press.
- Chong, E., Huet, F., Saussier, S., and Steiner, F., (2006), 'Public-Private Partnerships and Prices', *Review of Industrial Organisation*, Vol. 29, Nos 1-2, pp 149-169.
- Chong, E., Huet, F. and Saussier, S., (2006), 'Auctions, Ex Post Competition and Prices: The Efficiency of Public-Private Partnerships', *Annals of Public and Co-operative Economics*, Vol 77, No. 4, pp 521-554.
- Collins, H., (1999). "Regulating Contracts". Oxford. Oxford University Press
- Crouch, M. (2006), 'Investment under RPI-X: practical experience with an incentive compatible approach in the GB electricity distribution sector', *Utilities Policy*.
- Cubbin, J. S. and Stern, J. , 'The impact of regulatory governance and privatization on electricity generation capacity in developing countries', *World Bank Economic Review*, March 2006, pp 115-141.
- Dassiou, X. and Stern, J. (2008), 'Infrastructure Contracts: Trust and Institutional Updating', *City University Department of Economics Discussion Paper* http://www.city.ac.uk/economics/dps/discussion_papers/0806.pdf
- De Brux, J. (2008), 'The Dark and Blue Sides of Renegotiation: An Application to Transport Concession Contracts', Centre d' Economie de la Sorbonne, Université Paris 1 Panthéon Sorbonne.
- Foreman-Peck, J. and Millward, R., (1994), "Public and Private Ownership of British Industry 1820-1990". Oxford. The Clarendon Press.

Foster, C.D., (1992). “*Privatization, Public Ownership and the Regulation of Natural Monopoly*”. Oxford. Blackwell.

Frilet, M., (2004), ‘Building or Improving Public Infrastructure Services with the Private Sector: The French Experience’ Presentation at the World Bank, Washington, D.C.

Gomez-Ibanez. J.A. (2007) ‘Alternatives to Infrastructure Privatization Revisited: Public Enterprise Reform from the 1960s to the 1980s’, *World Bank Policy Research Working Paper No. 4391*.

Guasch, J.L. (2004), '*Granting and Renegotiating Concession Contracts: Doing It Right*', World Bank Institute.

Guasch, J.L., Laffont, J.J. and Straub, S., (2002), Renegotiation of Concession Contracts in Latin America. *World Bank Policy Research Working Paper No 3011*.

Guasch, J.L., Laffont, J.J. and Straub, S. (2007). ‘Concessions, of Infrastructure in Latin America: Government-led Renegotiations’, *Journal of Applied Econometrics*,

Guasch, J.L. and Straub, S. (2006), 'Renegotiation of Infrastructure Concessions: An Overview', *Annals of Public and Cooperative Economics*, Vol. 77, No 4., Vol.22, No. 7, pp. 1267-1294.

Gutierrez, L.H. (2003) The Effect of Endogenous Regulation on Telecommunications Expansion and Efficiency in Latin America, *Journal of Regulatory Economics*, 23, n. 3, 257 - 286.

Hannah, L., (1979), “*Electricity before Nationalisation: A Study of the Development of the Electricity Supply Industry in Britain to 1948*”. London. The Macmillan Press.

Laffont, J-J, Tirole, J., (1993), ‘*A Theory of Incentives in Procurement and Regulation*’. MIT Press.

Levy, B. & Spiller, P.T., (1994), “The institutional foundations of regulatory commitment: a comparative analysis of telecommunications regulation”, *The Journal of Law, Economics & Organisation*, Vol. 10 pp.201-246.

Marin, P. and Izaguirre, A. K., (2006), ‘Private Participation in Water: Towards a new generation of projects?’, *World Bank PPIAF Gridlines No. 14*.

Menard, C. and Saussier, S. (2002), 'Contractual Choice and Performance: Water Supply in France', in E. Brousseau and J.M. Glachant (eds.) *The Economics of Contracts: Theories and Applications*, Cambridge University Press.

Newbery, D. M., (1999), “*Privatization. Restructuring and Regulation of Network Utilities*”, MIT Press.

Pezon, C, (2003), 'Water supply regulation in France from 1848 to 2001: a jurisprudence based analysis', ISNIE Conference 2003.

Pezon, C, (2004), 'Users' Participation in French Drinking Water Services from 1850-2003 through the Jurisprudence of the Conseil d'Etat', Mimeo.

Spiller, P. (2004), 'An Institutional Theory of Public Contracts', ISNIE Conference 2004.

Spiller, P. (2008), 'An Institutional Theory of Public Contracts: Regulatory Implications', *NBER Working Paper No. w14152*

Stern, J. (2003), 'Regulation and Contracts: Substitutes or Complements? Lessons from UK Historical Experience', *Journal of Policy Reform*, Vol. 6, No 4, December 2003.

Stern, J. (2005), 'Regulation and Contracts: The Inevitability of Discretion', CCRP Workshop, Barcelona, Spain.

Stern, J. (2006), 'Capital Efficiency and Infrastructure Regulation: Editorial Introduction', *Utilities Policy*.

Tenenbaum, B. and Izaguirre, A. K., (2007), 'Private participation in electricity: The challenge of achieving commercial viability and improving services', *World Bank PPIAF Gridlines No.21*.