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**THE ROLE OF THE REGULATORY ASSET BASE AS AN
INSTRUMENT OF REGULATORY COMMITMENT**

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ABSTRACT

This paper discusses the emergence and evolution of the regulatory asset base (RAB) as a key aspect of infrastructure industry regulation in the UK and other countries. In Britain, the RAB emerged during the 1990s after privatization of the main network infrastructure industries. It was initially developed for the England and Wales water industry, but its use spread to UK energy (primarily networks), to railway networks and to the fixed line telecom network. A key feature of the RAB is that it nowhere appears in primary legislation. The paper discusses and presents evidence that the most important feature of the RAB is the process by which the RAB is reassessed and revised and that this provides considerable evidence on the consistency and transparency of regulatory regimes. The quality of this process varies considerably by country and these differences seem to be reflected in ratings agency judgments and share price movements. In the UK, Australia and some other countries, the RAB model has provided a considerable degree of protection against retrospective ‘asset taking’ without imposing the rigidities of the full US ‘rate base’ model.

KEYWORDS

Infrastructure, RAB, utility investment, credit ratings.

ROLE OF THE REGULATORY ASSET BASE AS AN INSTRUMENT OF REGULATORY COMMITMENT

Jon Stern

1. Introduction¹

Britain has extensively used the RAB (regulatory asset base)² to provide investors in privatized network utilities with comfort that their investments will not be treated unfairly. In particular, RAB protection has de facto become the major perceived underpinning of investor expectations for UK infrastructure industries, particularly against (a) retrospective ‘asset-taking’ and (b) against the future stranding of assets. RABs exist in a number of other countries but they are only significant as a commitment device in countries where network infrastructure utilities (or at least the network elements) are privately rather than publicly owned.

One of the curiosities of the British RAB approach is that it has become so important without any explicit legislative backing. For instance, the current legislation for water defines the primary duties of Ofwat (the economic regulator for water and sewerage in England and Wales) as:

- (i) furthering the consumer objective; and
- (ii) ensuring that regulated water companies “... are able (in particular by securing reasonable returns on their capital) to finance the proper carrying out [of their regulated water functions]”³.

The relevant legislation for electricity, gas, railways and telecoms uses a similar formulation.

There is no mention of RABs in UK primary legislation. The current British RABs evolved following the privatization of the UK network infrastructure industries as a regulatory device to reassure investors – and hence keep down the cost of capital. They are primarily intended as protection against actions by regulators or governments that could lead to asset stranding. *However, precisely because they have no explicit legislative support, their reliability as a commitment device depends crucially on regulators keeping to the spirit as well as the letter of RAB commitments.* If UK regulators were seen by investors as violating that spirit, then the RAB’s credibility as a

¹ I’m very grateful for advice and assistance with this paper from Martin Cave, Neil Griffiths-Lambeth and Stefanie Voelz. Particular thanks go to Chris Bolt and Jonathan Mirrlees-Black. Responsibility for the views expressed and for any remaining errors is solely the responsibility of the author. An extract from this paper appeared in the February 2013 CERRE report on regulatory stability and the challenges of re-regulating.

² Or its RCV (regulatory capital value)/RAV (regulatory asset value) equivalents

³ See Ofwat (2010) “Financeability and financing the asset base – a discussion paper”, p.10.

commitment device could disappear very quickly – and would probably be virtually impossible to retrieve. In this regard, investor perceptions are almost as important if not more important than observed developments.

The importance of RABs as a commitment device is not, however, just in their existence. It arises primarily out of the regulatory context in which they are set, updated and revised. *The key conclusion from this review is that the role of the RAB as a commitment device is a consequence of the quality of its implementation rather than from the definition of the RAB per se.* Well defined RABs in insecure regulatory environments offer little as a commitment device; whereas, at least in principle, the same degree of commitment could be offered by a secure regulator using a different mechanism. It is just that RABs have been accepted as a useful device for UK and other infrastructure regulators and their relative success – and familiarity - has provided a reputational support. Indeed, it may be that the success of the UK RAB concept arises precisely because it does not have legal force. This, unlike the US ‘rate base’ model, allows for the regulator to amend contracts via an ordered review, revision and renegotiation of licences⁴.

A major issue for the British RAB approach has been where vertically integrated infrastructure companies were privatized as bundled entities but where, some years later, governments and/or regulators wish to separate networks from services, introduce upstream and or downstream competition in service markets and unbundle the companies. This has posed the most important challenges to the use of UK-style RABs as a commitment device in natural gas and water; plus, to a lesser extent, in telecoms and rail. It was not an issue in the England and Wales electricity industry since generation was fully (ownership) separated from transmission before privatization. These competition and unbundling issues and their implication for the RAB as a commitment device will be discussed in more detail in Section 3 below.

In the US, investor protection is given via explicit legal protection e.g. by the 1944 Supreme Court Hope Gas ruling and subsequent administrative law determinations⁵. That provides more certainty but, arguably, at considerable legal and management cost. However, the US ‘rate base’ approval model does not provide total protection to investors either in theory or practice since only “efficiently incurred” costs are included in the rate base and “inefficiently incurred” costs can be excluded. In practical terms, costs can be – and have been - disallowed from the rate base as not passing the efficiency test (viz. US disputes and disallowances of some nuclear power station construction costs in several states in the 1980s). This undoubtedly had a chilling effect on US nuclear plant construction but, it does not appear to have had wider effects on the rate base approach as a commitment device to support private investment in electricity or other infrastructure

⁴ Where licences represent explicit or implicit contracts. See Jon Stern (2012) “The Relationship between Regulation and Contracts in Infrastructure Industries: Regulation as Ordered Renegotiation”, *Regulation and Governance*.

⁵ In the Hope Valley Gas case, the US Supreme Court interpreted the 14th Amendment of the US Federal Constitution to prohibit “regulatory takings”. This ruling became a cornerstone of US utility regulation.

network industries. This may be because the strong and explicit legal underpinnings effectively and clearly limit cost exclusions.

RAB integrity and the degree of protection of private investors on asset stranding, particularly over the introduction or widening of competition, has emerged as a problem in various jurisdictions. Examples include the failed California electricity reform and Spanish electricity (both involving nuclear plants). Another example is the problems over the unwinding of very long (e.g. 25 year) Central European privately financed generation refurbishment and operations contracts when their countries were obliged to introduce competitive generation markets on joining the European Union⁶. In all these cases, transitional arrangements were made involving customer and/or network price surcharges.

The British RAB alternative, although more fragile in theory, appears in practice to provide considerable protection relative to the US model via reputational effects on the cost of capital. Primarily because of the way that UK regulators have treated its revision, it regularly scores highly in ratings agency appraisals⁷. It also appears to allow the easier negotiation of change between regulators and companies e.g. as regards unbundling and the introduction of competition⁸. This was successfully achieved and without too much difficulty in UK natural gas, in telecoms and in the recent vertical unbundling of the Scottish vertically integrated power companies. However, quite what the RAB protects and how it can be reallocated with changes to the market and corporate structure of the industry has become a major issue of contention in the English water industry. This example shows well the expectations of the parties and the limits on the regulator from modifications to the RAB that are perceived as threatening its security (e.g. in debt contracts).

In what follows, I firstly outline in Section 2 the current pattern of RAB and RAB-like arrangements for public and privately owned infrastructure companies, including the observed historical evolution of the RAB as a financial protection device in the UK. Section 3 discusses its role as a stranded asset protection device in the UK and some EU countries and Section 4 discusses the implications for the RAB when vertically integrated utilities are separated between a monopoly network and competitive upstream and/or downstream sectors. Section 5 reports the limited evidence available on the impact of RABs and their regulation on credit ratings and share prices. The paper ends with a few concluding comments.

2. The Evolution and Development of RABs

The key concept behind the RAB is FCM (financial capital maintenance). This was used as one of the control methods for the UK nationalized industries from the late 1980s. Hence, FCM - and the RAB – address the issue of whether the financial capability of the

⁶ This was a particular problem for Hungarian electricity.

⁷ See, for instance, Moody's Global Infrastructure Rating Methodology, 2009 and country infrastructure company rating surveys.

⁸ See Stern (2012) op cit and Section 5 below.

company is being maintained intact. This clearly relates to but is separate from whether the physical supply capacity of the company is being maintained intact i.e. OCM (operating capital maintenance).

2.1 Key RAB Concepts

If the revenue receipts from sales are insufficient to cover maintenance renewals and new investment sufficient to maintain the supply of goods and services, the supply capacity of the physical capital stock (and typically the value of the OCM) will erode unless topped up from subsidies of one kind or another. Conversely, if the revenue receipts are insufficient to cover depreciation and earn a normal rate of return on the replacement cost of the assets, the value of the FCM will erode, again, unless the government provides some explicit or implicit subsidy or other financial input. The RAB this becomes crucial as a mechanism for FCM protection of private investors on infrastructure industries.

In general terms, a starting point for the value of the RAB can be expressed as:

$$(1) \quad \textit{Gross current cost of assets} + \textit{provision for depreciation} = \textit{Net book value}^9$$

This is a general formulation which applies widely across all infrastructure industries.

In most non-UK cases, the net book value in (1) above is the same as the RAB. However, for the privatized UK network infrastructure industries, the RAB is a lot lower than the net book value because, at privatization in the 1980s, the assets were sold at a substantial discount. At the extreme, for the England and Wales water industry, the current replacement cost (or MEA value) of the assets in 2010 prices was about £224 billion but the privatization proceeds were £5.3 billion¹⁰. The difference is the privatization discount. Hence, following Vass (1999)

$$(2) \quad \textit{Net book value} - \textit{Privatization discount} = \textit{RAB}$$

The initial value of the UK water RAB is the average market value of the privatized water companies over the first 200 days for which the shares were listed in 1989. This starting value was applied in 1990 and has since been updated annually by the 12-month rate of (retail price) inflation. To this is added each year, at current prices, the capital expenditure to enhance and maintain the network – gross investment - and from that sum is deducted current cost depreciation. Hence, the RAB for the privatized UK water industry is made up of:

- (i) a heavily discounted value of the assets at privatization in 1989, annually revalued by inflation; *plus*
- (ii) capital stock increments since 1989 valued at their incurred cost; *minus*

⁹ See Peter Vass (1999) “Accounting for Regulation”

¹⁰ See Ofwat (2010), “RD 04/10 Regulatory Capital Values 2010-15”. The privatization proceeds in 1989 prices were £5.3 billion gross.

- (iii) current cost depreciation on post-privatization assets¹¹.

The RAB calculation for water outlined above applies to at least the network elements of all the other main UK infrastructure industries privatized after 1980 i.e. electricity, natural gas, telecoms, airports and rail¹².

TEXT BOX 1

RAB Commitment Device Alternatives

There has been much discussion of RABs and alternatives in the UK, particularly in the 1990s. For instance, the RAB could be equivalently calculated by applying a lower depreciation rate to the MEA value of the assets, but this does not seem to have been done for any UK infrastructure industry. It was proposed by Ofgas for British Gas but was not implemented and has not since been seriously put forward.

The discussion of privatization discounts leads to complicated arguments over MARs (market asset ratios) and how they should be estimated, including whether the relevant measure is backward or forward looking. Michael Beesley argued for a forward looking view of regulation where regulators judged the adequacy of cash flows over the price control period rather than a committed rate of return on a RAB. (See M. Beesley, (1997), "Privatization, Regulation and Deregulation"). Beesley's support for a forward looking commitment test was justified by an asset based test using Tobin's q as a basis. With $q = 1$, the RAB equals the market cap, implying no monopoly rents. This can then be used to provide a test of the appropriateness of the regulator-set cost of capital. (See Beesley op cit, p.176.) The resulting forward looking cash flow test plus a Tobin q test could then be used as a commitment device comparable to the standard RAB.

Although this cash-flow based concept was set out in the MMC 1993 British Gas Report, it has not been taken up by UK or other regulators. In the meantime, the RAB model with privatization MARs has become familiar and well-established. For further discussion of UK RAB concepts and the 1993 MMC British Gas Report, see David Newbery (1997), "Determining the regulatory asset base for utility price regulation", *Utilities Policy*, Vol 6, No. 1.

The value of the RAB for the England and Wales privatized companies will retain its privatization discount relative to net book value so long as the pre-privatization assets

¹¹ Either as current cost depreciation or as an equivalent infrastructure renewals charge.

¹² For Railtrack, the RAB was set before flotation, with regulator-written Letters of Comfort from the first Rail Regulator in the Railtrack privatization prospectus. Note that there were no RAB write-offs following its reconstitution as Network Rail, after the Hatfield crash and its subsequent crisis.

remain in use. The privatization discount only falls away as the pre-privatization assets fall out of use. For tunnels, ducts and similar that could be decades if not centuries.

For infrastructure industries in the US and other countries which have been in private ownership since their inception or for very long periods, the value of the RAB is the same as the net book value. Similarly, for state owned industries where there is a RAB, there is no discount of this kind which needs to be taken into account. Hence, in both cases, the value of the RAB is equal to the net book value of the assets

Interestingly, a number of EU countries also have RABs but ‘simple’ ones. For instance, Austria, Belgium, Finland, France, Germany, Ireland, Italy, Netherlands and Spain all have electricity and gas network RABs for electricity and gas transmission/transport although in several cases, the companies are fully state-owned. Somewhat surprisingly, the electricity network RABs in Belgium and France include working capital as do the gas network RABs in Belgium, Germany and Italy¹³. (Section 3 below discusses how far some major EU country RABs and the regulatory structures in practice provide an effective commitment mechanism.)

Looking more widely, Australia and New Zealand both have RABs for many of their infrastructure industries – as do Brazil and Chile for their water industries. Most of the Australian and New Zealand examples are for publicly owned entities but often (as in gas and electricity) for vertically unbundled entities where the RAB just applies to the network.

The effectiveness of these RABs depends on the quality of the regulators who apply them. In general, one would expect them to be more effective for privately owned industries and there can be major problems in RAB enforcement in state-owned industries. For instance, in September 2012, the French government announced that retail gas prices to individuals and small businesses would rise by 2%, even though CRE, the French energy regulator had stressed in the *Journal Officiel* that the increase was insufficient and the increase to individuals to ensure cost recovery should have been 6.1%. GdF-Suez may have a RAB, but it clearly did not act as an effective commitment device in this case¹⁴. However, Ireland has state-owned electricity and gas industries and there have been no such RAB commitment problems there. Conversely, we will see in Section 3 that RAB commitment issues arise in some EU countries with privately owned infrastructure industries.

One of the key issues for RABs is what they cover. For water, it is currently almost always the whole company but, for energy, it is often for the transmission/transport network (and local distribution networks but without generation or upstream gas (or wholesale and/or retail suppliers) and similarly for telecoms.

2.2 The Evolution of RABs as a Commitment Device in the UK

¹³ See IERN (2010) “Overview of European Regulatory Framework in Energy Transport”

¹⁴ See NERA *Global Energy Regulation Newsletter*, September 2012, p.5.

RABs (or RCVs, RAVs) in the UK were initially developed for UK infrastructure industries by Ofwat (the England and Wales economic regulator for water and sewerage) in the early 1990s. They are nowhere mentioned in legislation nor has there been any explicit mention of the term in water or other UK network infrastructure industry licences¹⁵. Ofwat created them for the purpose of setting its first set of 5-year price limits which were published in 1994.

The water and sewerage (and water only) companies were privatized as vertically integrated utilities with a (natural monopoly) network at their centre. The same was true of natural gas and telecoms – but not of electricity or railways. Electricity was unbundled before privatization and there has never been a RAB for the electricity generating companies or their assets or for the (post-1998) separated electricity retail supply companies. Similarly, for railways the RAB only applies to the network which was separated out from the other elements before privatization and not to the train operating or other companies involved in the rail industry.

British Gas progressively unbundled itself from 1997, following various investigations by Ofgas (the gas regulator) and the competition authorities. That led to a reallocation of the RAB. A RAB has been created in telecoms for BT's fixed line local loop assets – which are now in functionally separated OpenReach. In water and sewerage, Ofwat has in recent years pursued the introduction of competition (retail and, to a lesser extent, wholesale) and this has generated major arguments about the consequences for the RAB and whether those would reduce its power as a commitment device. The arguments in gas and telecoms seem to have been resolved whereas the ones for water are still very much ongoing.

Dieter Helm is a major supporter of the UK RABs as a commitment device. He argues the case for them as follows¹⁶:

- (i) They directly address and solve the time inconsistency problem. That problem arises because governments and regulators have powerful incentives to drive the prices of sunk assets down heavily, so that current consumers pay prices only reflecting short-run marginal costs and the long-lived sunk, fixed assets are never properly remunerated.
- (ii) The RAB solves this problem by an agreed valuation of old assets and (efficient) new assets which are “bought” by the RAB. All assets in the RAB, old and new, are then remunerated according to a pre-set rate of return.
- (iii) Given the financing obligation in law and the licences, “... investors know that they will not be expropriated and have an independent regulator to protect them”.

¹⁵ NATS (the UK air traffic control system) is the only exception but that operates as a PPP.

¹⁶ See D Helm (2012), “The Draft Water Bill: a Critique”, p.15.

- (iv) The consequences of (i) – (iii) are a sustained low cost of capital and little difficulty for the regulated company in raising new finance (equity or debt) at moderate rates.

Note that Helm applies this argument to water *companies* and not just to the network elements. Advocates of competition in upstream and retail water supply would happily accept the argument for the network elements but not for the other parts¹⁷. The core issue here is whether the water industry is a natural monopoly system *as a whole* (as Helm, the water companies and others argue) or whether it is just the network which is the natural monopoly - as has now been generally accepted for the other network infrastructure industries. This argument is currently ongoing and the question as to whether the RAB's role as a commitment device would be seriously undermined by the introduction of substantive competition and vertical unbundling are at the heart of that debate.

In a recent paper Ofwat described the purpose of the RCV in very similar terms to Helm. Ofwat wrote recently¹⁸:

“The RCV tool provides a degree of commitment to remunerate investors for delivering substantial investment programmes for long-life assets. *This commitment to the RCV and the transparency and consistency in its calculation has allowed companies to raise finance at competitive rates.* [My emphasis] It has also allowed them to achieve a relatively low cost of capital despite the significant investment requirements and the cash flow negative nature of the sectors.”

Ofwat points out that the RAB:

- (a) provides protection against asset stranding;
- (b) has become the key measure by which investors assess the enterprise value of the regulated companies;
- (c) has become the key measure against which debt leverage is assessed – and has become enshrined in bond covenants; **but**
- (d) this may mean that investors continue to receive returns for past investment which may now be inefficient; **and**
- (e) it may contribute to a bias towards capital-intensive solutions.

The current state of UK RABs and the debate around them can now be summarized as follows:

¹⁷ See Cave Review (2009), J Stern and J Mirrlees-Black (2011), “A Framework for Valuing Water in England and Wales from 2015 Onwards” for the case in favour of more competition in water supply. See also Ofwat Future Price Limit papers 2010-12.

¹⁸ See Ofwat (2011) “Financeability and financing the asset base – a discussion paper”, pp16-17.

- There is general agreement that RABs are an effective commitment device for natural monopoly network elements of infrastructure companies – provided that regulators keep to the spirit as well as the wording of the rules;
- RABs have maintained a low cost of capital for privately financed infrastructure investment in the areas which they cover – typically much lower than would be paid under project finance contracts (e.g. 5-7% rather than 15% or more)¹⁹;
- The key to RAB success is that it provides effective protection against asset stranding e.g. by regulators arbitrarily changing the rules on depreciation or asset classification;
- The implication for the unbundling of companies has thrown up – and continues to generate – major RAB-related disputes, primarily over RAB (and privatization discount) reallocation;
- Disagreements and debate continues on whether RABs should be applied beyond the natural monopoly network elements of infrastructure companies, viz. the water industry debate and suggestions for RABs on large investments in competitive sectors (e.g. nuclear generation).

In the next section, there is further discussion on the role of RABs in stranded asset protection and the impact of vertical unbundling.

3. RABs as a Protection against Asset Stranding

In the US “rate base” system, all efficient (and efficiently) procured assets are, by law, guaranteed cost recovery. Further, there are common Federal guidelines on depreciation rules, etc which are applicable at State level as well as Federal level. This provides very considerable security to investors – and it allowed the major expansions of privately financed electricity and gas networks in the 1950s and beyond at very low debt coupon rates. Once US infrastructure assets are incorporated in the rate base, their economic remuneration is effectively assured; the threat of asset stranding is very low indeed.

The US rate base system is stronger than the protection offered under RABs and supporters of it argue that a stronger statement of the right to cost recovery should be written into the UK (and EU) infrastructure industry regulatory systems²⁰. It is true that the US system provides very strong protection against stranded asset losses, but it is not complete. For instance, assets have to be accepted into the rate base as “efficient”. The disallowance of various nuclear costs in the 1980s – and the subsequent bankruptcy of

¹⁹ In some cases, they may be lower in project finance contracts e.g. where everything is tightly tied down in fixed contracts and all potential risks have effectively been eliminated.

²⁰ See, for example, Graham Shuttleworth’s 2007 Memorandum to the House of Lords Select Committee on Economic Regulators.

some investor-owned utilities – shows it has its limits as a protection against stranded asset assets. In addition, there are other limitations, including:

- (i) the combination of rate base protection with rate of return regulation led to weak incentives to improve efficiency and, in some cases, to ‘gold-plating of investments (the classic Averch-Johnson effect); and
- (ii) the strength and legal structure of the rules mean that legal separation within vertically integrated utilities is extremely hard if not impossible. This is an important reason why US electricity companies have adopted ISOs (independent system operators) rather than ITSOs (independent transmission system operators) both at State and multi-State level²¹. They also greatly complicate the introduction of competition into vertically integrated industries.

In the UK, RABs do not provide the US-level of protection against asset stranding but do have more flexibility. Although not explicit licence conditions, they are integral to price reviews so that regulatory price determinations that involve a revaluation of the RAB (e.g. via changes in depreciation rules) can be appealed to the Competition Commission. That, in practice, means that there is a lot of pressure on regulators against making changes in RAB values that are radical and/or hard to justify. At worst, regulators may be required to offset adverse RAB rulings with concessions to the regulated company arising from other parts of the settlement (e.g. on rate of return, length of price cap or other issues).

The less than totally legally binding framework is important as it allows easier evolution via the degree of flexibility. However, since it is *bounded and accountable flexibility* with strong appeal rights, the role of the RAB as a commitment device has not, in general been undermined by the absence of a US-style cost recovery obligation on past assets. In this context, Richard Nourse’s comment on the financing issues arising from Ofwat’s competition proposals is particularly apt:

“Investors do not expect Ofwat to provide a “silver bullet” to take away the risk of regulatory change from the current reviews. It is recognized that Ofwat could not say something like *We guarantee that as a result of all this competition stuff, we will not touch £1 of RCV*”²². [Nourse’s emphasis]

However, in practice, there have been some serious disputes between UK infrastructure companies and their regulators over RAB/RCV redefinition. These provide useful information on how far UK RABs in practice provide protection against ‘regulatory takings’.

²¹ See Jon Stern, Martin Cave and Guido Cervigni, CERRE (2011), “The role of systems operators in network industries”, Chapters 3 and 4.

²² Richard Nourse (2009), “Competition proposals and financing issues: A report for Ofwat”. http://www.ofwat.gov.uk/competition/review/rpt_com_nourse260209.pdf

3.1 UK Disputes over Retrospective RAB Modification

There have been two noteworthy UK disputes which affect the use of RABs as an effective commitment device and these are briefly outlined below.

3.1.1 UK Fixed Line Telecoms

A major set of RAB disputes has been in telecoms. Ofcom in 1997 chose to value all of BT's fixed line network assets on a CCA (replacement cost) basis. In 2005, Ofcom decided to replace this with historic cost valuation of the pre-August 1997 assets. These were placed in a standard 2005 price historic cost (HCA) valued RAV, which was to be updated after 2005 by retail price inflation. All post-1997 assets would continue to be valued on a CCA basis. Interestingly, the change in accounting methods was accompanied by changes in asset accounting lives, the weighted cost of capital and other changes which led Ofcom to predict that the unwinding of the RAV would increase the costs associated with the in-scope assets by 3% in 2009-10.²³

The core issue with telecom depreciation rules is that, given technical progress and cost trends in telecoms, switching from HCA to CCA leads to windfall gains and over-recovery of costs by the incumbent operator. This is because of the time-profile of payments. For the local loop, a switch from HCA to CCA leads to higher payments in the earlier years of the assets and lower ones later. Hence, this leads to an over-recovery of costs for young assets that have not long been in use. Ofcom's eventual choice of an abated CCA approach to the RAB valuation of post-1997 assets produces an answer that offsets the choice of RAB valuation method²⁴.

The speed of technical progress in telecoms together with the contestability of the market even for local loop assets has led to continued pressure to change the revaluation rules for BT's network assets. The reason for the 1997 decision was that Ofcom (and BT's competitors) argued that CCA valuation led to BT "over-collecting" revenues on old assets. In 2011, Frontier Economics used that argument to advocate a unit cost rather than CCA based valuation of post-1997 assets²⁵. In its final determination, Ofcom left unchanged the treatment of pre-1997 assets as an indexed HCA RAV. However, Ofcom signaled its intention to revisit – and probably change – the CCA treatment of post-1997 assets²⁶.

The account above shows that the regulatory commitment that was provided to BT by the RAV and the related asset valuation issues was far less than absolute. However, there does not appear to have been great damage done to the availability or costs of finance to

²³ Ofcom, "Valuing BT's copper access network – Final Statement", 18/08/2005.

²⁴ See Martin Cave, Antoine Fournier and Natalia Shutova (2012), "The Price of Copper and the Transition to Fibre", *Digiworld Economic Journal*, No. 85.

²⁵ Frontier Economics "Duct and copper valuation: A Report prepared for Sky and TalkTalk", October 2011.

²⁶ Ofcom "Charge control review for LLU and WLR services", 31 March 2011.

BT. In part that was probably due to the offsets in the 2005 decision, but it is also in large part due to the fact that:

- many (but by no means all) asset lives in telecoms are relatively short;
- even local loop assets are increasingly contestable; and
- telecom products are sold into highly income elastic, growing markets.

It may well be that the impact on the availability and cost of capital would have been significantly different if the same actions had been taken by the energy or water regulators.

Note that similar issues arose with French telecoms and that ARCEP (the French telecoms regulator) also switched in 2005 from valuing the local loop asset base from HCA to CCA with tilted annuity depreciation. The net value adjustment was crucial for maintaining the net present value of the RAB valuation of the local loop while switching the depreciation method²⁷.

3.1.2 Northern Ireland Gas

There has recently been a dispute between Phoenix Natural Gas (PNGL) and the Northern Ireland Authority for Utility Regulation over a proposal by the regulator to reduce the total regulatory value (TRV) as specified in the 1996 Phoenix licence.

This dispute has not yet been concluded. It went on appeal to the UK Competition Commission (CC). In March 2012, the CC issued a provisional determination which rejected the proposed retrospective regulatory value adjustment.

The CC concluded that there was not a sufficiently strong case for implementing the proposed adjustment. The reasons given were²⁸:

- (i) the benefit to current consumers would be small while the adverse effect on future consumers from lower network expansion could be sizeable;
- (ii) the likelihood of increases in the cost of capital for Phoenix customers – and the possibility of that being extended to consumers of other network infrastructure industries in Northern Ireland.

These are classic arguments that one would derive from the use of RABs as a commitment device e.g. as set out by Dieter Helm and Ofwat and shows how embedded they have become in UK regulatory practice.

²⁷ See Cave et al (2012), op cit, pp 154-158.

²⁸ Competition Commission, “Phoenix Natural Gas Ltd price determination: Summary of proposed determination”, 3 August 2012. See especially pp12-13.

The case set out in the CC's provisional March 2012 determination was upheld in its final determination of 30 November 2012. The CC rejected the Northern Ireland energy regulator's proposal to reduce Phoenix's TRV, with the exception of some 1999-2000 capex deferrals.

4. The RAB and the Implications of Introducing Competition into Potentially Competitive Markets

When vertically integrated infrastructure companies are unbundled and competition is introduced, the RAB has to be reconsidered and is typically reallocated.

The most obvious economic problem is that some assets installed in a regulated monopoly environment may, in a competitive market, become commercially unviable and hence be stranded. The most obvious example is nuclear power stations, but it can also be a significant problem for water and sewerage treatment works. Essentially, these (and some other) investments would not have been built by private investors operating in a competitive market. However, having been installed in a regulated monopoly supply market, they still have many years of potential engineering life but are unlikely at market prices to recoup their construction and operating costs and earn a normal rate of return on the original investment.

These problems have arisen for nuclear power in the US (particularly California) and in Spain. The Hungarian and other Central European long-term PPAs to finance generation refurbishment contracts are another example. In all these cases, when generation markets were made competitive in Spain and California, it was arranged that network-linked or consumer charges would be paid to the asset owners for a transitional period to meet the projected revenue shortfall. In California, this was linked to the preservation of the rate base of the power companies who retained ownership (but not operating rights) in the privately owned power companies.

TEXT BOX 2

Nuclear Power, Generation Markets and RABs in the UK

In England and Wales, the post-1989 none of the privatized electricity generation companies have ever had RAB protection.

Initially, the post-1965 nuclear power stations were privatized as part of National Power and, in 1995, they were separated out and put in a new company – British Energy. However, in 2002, British Energy had a financial collapse as gas-determined generation prices were too low to allow continued viability of the nuclear stations given British Energy contracts for fuel reprocessing, etc. Following a major financial reconstruction exercise, British Energy's nuclear plants were, in 2008, purchased by EDF with a right to apply for construction of new nuclear plants on existing sites.

These events have led some observers (including Dieter Helm) to argue for RABs to be applied to nuclear generators in the UK. However, introducing RABs but only to some of the assets used in competitive markets raises a number of other problems on the fairness of the resulting competition.

Doing so for nuclear power companies creates – or perhaps merely recognizes – a ‘too big to fail’ problem. If support is needed for such assets, it can and should be done much more transparently.

Besides the nuclear power issue, the implications for UK RABs of introducing competition have been most important – and most hotly argued - for natural gas (the British Gas unbundling) and for water and sewerage in England. However, in other industries, competition has been widened and UK RABs have been successfully reallocated without controversy. Examples include the separation of transmission from generation in Scottish Power and Scottish Hydroelectric after 2005 and their incorporation into a GB ISO (but with Scottish Power and Scottish Hydroelectric retaining ownership) and the functional separation of BT's fixed lone network entity (OpenReach) within BT.

The RAB commitment issues that have arisen in UK gas and English water are briefly discussed below.

4.1 RABs and the Vertical Unbundling of British Gas

Most of the discussion of the unbundling of British Gas (which became BG Plc in the mid-1990s) and the separation of its network went relatively smoothly once British Gas had decided to unbundle its non-retail businesses following a series of regulatory and competition agency reviews during the 1990s. However, there was one major stumbling block: the reallocation of the RAB between the high pressure gas transport network and the storage business.

The problem was the privatization discount - how would that be allocated between the network and non-network businesses? The choice was between:

- (i) a “focused” reallocation under which all of the privatization discount was allocated to the transmission business and its RAB; and
- (ii) an “unfocused” allocation under which the privatization discount was allocated across the monopoly network and other businesses.

Fundamental regulatory economics suggested that the focused approach was the more appropriate one and that is what Ofgas recommended in its evidence to the MMC (Monopolies and Mergers Commission) enquiry in 1996-97. However, British Gas Transco argued strongly that it had operated all its businesses, network and non-network, under an unfocused approach for the 15 years since privatization. It consequently argued that, whatever the theoretical arguments, the RAB reallocation should allocate some of the RAB (and privatization discount) to the non-network businesses to reflect this.

The MMC decided in favour of the unfocused approach and spread the privatization discount between the transport business and the storage business. This increased the value of the RAB by £2 billion relative to the focused approach. In the following transmission price review, carried out by Ofgem (which had become the merged British electricity and gas economic regulator) it was not only decided to stick with the MMC unfocused RAB reallocation, but Ofgem made a commitment to retain it in future price reviews.

The importance of this for the valuation of the company and the cost of capital is shown by the fact that the share price of Lattice (which by then owned Transco) rose by about 10% on the release of the news of the Ofgem 2001 decision²⁹. It had previously fallen back when it was felt that the *company's* RAB valuation was under threat, even if the core network RAB was still fully protected.

4.2 The introduction of competition in the water industry in England and implications for the RAB

In recent years, Ofwat has been making proposals for increasing competition in the England and Wales water and sewerage industry. This reflected and followed the recommendations for more competition in the 2009 Cave Review. The proposals for water are more far-reaching than for sewerage. However, the Ofwat (and Cave) proposals are only being taken forward in England³⁰. Up to October 2010, Ofwat was exploring at least functional unbundling of the different elements of water companies but this has now been dropped – at least for the 2014-19 Price Review period.

²⁹ See NERA Energy Regulation Brief by Graham Shuttleworth (2001): “Ofgem ‘focuses’ on important matters at Transco”. The discussion above draws heavily on this note.

³⁰ The Welsh Government has said that it is not currently willing to pursue extensions in retail or wholesale competition.

The Ofwat proposals, particularly for vertical unbundling and increased upstream competition, have been received with considerable hostility by the water companies and also by investors. The main argument against the proposals has been the RAB and the potential damage that might be done to the RAB by unbundling proposals. A great deal of pressure and lobbying has been carried out against the Ofwat proposals both by the water companies and investors. In consequence, Ofwat has made it clear that all investments made up to March 2015 would be included in the RAB under the current inflation uprating rules. Ofwat has since given commitments³¹ that it will:

- (i) continue to use the RCV as the main method for cost recovery within the wholesale function;
- (ii) allocate all of the RCV to the wholesale function;
- (iii) commit to not moving more than 20% of total revenues out of the wholesale control in any 5-year (or longer) price period; and
- (iv) commit to not cumulatively moving more than 40% of revenues from the wholesale control in toto.

It remains to be seen whether the water companies accept these proposals or whether at least some of them appeal them to the Competition Commission.

The RAV arguments are not just about principle. The fundamental point is that the water companies have become highly geared. For the sector as a whole, indebtedness has increased sharply with gearing for the sector as a whole of 69% in March 2010, up from near-zero in 1986. Further, according to Nourse (2009), three of the ten combined water and sewerage companies had net debt in 2008 of over 70% of the RCV, with two companies (Anglian Water and Southern Water) with net debt at over 80% of RCV.

Since RCV conditions enter into debt covenants, there is enormous hostility by companies and financial institutions to anything that could trigger a material change determination from the ratings agencies and debt holders. Increasing competition and putting a substantial volume of revenues in a competitive, non-RCV part of the business is the nightmare. Nourse advised that many of the more far-reaching pro-competition and unbundling options could trigger debt covenants, but also that many initial steps would not necessarily trigger debt covenant problems.

However, the UK Government (and Ofwat) has, in response, not only ruled out mandatory network-service unbundling for England and Wales (at least up to 2019), but it has also decided not to impose legal separation on water companies' retail arms – unlike in Scotland³². The main reason for those decisions seems to be the perceived need

³¹ Ofwat “Consultation on Ofwat’s section 13 proposals to modify company licences”, October 2012.

³² See UK Water White Paper 2011 and the 2012 Draft Water Bill.

to maintain faith in the RAB as a binding commitment device for a sector which has been cash-negative and faces substantial investment requirements over the next 10-20 years. It remains to be seen whether future UK governments (and Ofwat) feel able and willing to be more relaxed over competition (particularly upstream competition and network-service separation) and its implications for the RAB and investment.

Whether or not the RAB fears in the water industry can be modified by gradual and anticipated pro-competition changes remains to be seen. However, there is no question that the perceived threats to the RAB as a commitment device for the English water industry have become a key factor in the debate. Those opposed to significantly more upstream competition and vertical unbundling currently are currently clearly in the minority and, for better or worse, are having less impact in the current water reform debate.

5. Evidence on the Effectiveness of the RAB as a Commitment Device

There is little direct evidence e.g. of proposed or actual RAB changes on share prices or debt coupons. However, there is some, like the impact of the 2001 Ofgem decision on the Transco gas RAB reported earlier. There is also no question that the ratings agencies pay considerable attention to RAB regimes and their security. In what follows, we consider what evidence there is, starting with the ratings agencies.

5.1 Ratings Agencies and the RAB

All the main credit ratings agencies operate in the infrastructure area and they have similar concerns and methods. However, in what follows, I focus on Moody's³³ which has been very active in the British water and RAB protection debate.

Moody's explains its approach to rating privately financed regulated water companies in its Global Regulated Water Utilities methodology, published in 2009. Another methodology, published in the same year, applies to regulated electric and gas networks. Both methodologies set out four key factors that constitute the rating agency's analytical framework.

RAB security is not specifically considered under the methodologies but the overall country regulatory environment and asset ownership model is one of the factors, accounting for 40% of the overall score. Within this factor, Moody's currently assign a score for stability and predictability of the regulatory environment and this accounts for 15% of the overall score.

Moody's currently assign the regulatory regimes in the UK a score of Aaa for the regulatory stability and predictability sub-factor. This reflects the historic stability and predictability of the regimes with a more than 20 year history and reliance on clearly defined risk allocation principles, which have been consistently applied and transparently disclosed. Whilst the indicated rating from the relevant methodology is only one

³³ Moody's Investors Service Ltd

(important) consideration in Moody's overall assessment, any perceived weakening of the regulatory regime would, according to the agency, most likely result in negative rating pressure.

According to Moody's, the RAB is a key part of the UK regulatory model and a weakening of regulatory commitment in this area, if not otherwise offset, would likely result in negative pressure on the scoring for the sub-factor. However, the agency does not have a scoring mechanism specifically for 'RAB commitment'. They believe that it would be challenging to devise such a scale and, in any event, RAB is only one part of the regime and not the sole focus³⁴.

Note that Moody's concerns with the quality of the regulatory regime within which RABs are embedded rather than RAB definitions per se echoes the main argument of this paper.

5.2 EU Countries and RAB Regulatory Regimes

We discussed the composition of some EU RABs above. Here we outline some of the regulatory arrangements for RABs in the energy sector in Germany, Italy, Netherlands and Portugal³⁵.

The key results are shown in the Table below.

³⁴ See Moody's Global Infrastructure Finance: Rating Methodology August 2009 – Regulated Electric and Gas Networks and communication with Neil Griffiths-Lambeth, Senior Vice-President, Moody's.

³⁵ The data for these illustrative examples are drawn from Moody's Investor Service Notes 2010-12 and I am very grateful to them for allowing me to use them in this paper.

Table 1

Regulatory Characteristics of RAB Energy Regimes in Four EU Countries

	Country and Company	German Electricity and Gas Network Companies (2010)	Italian Electricity Transmission – Terna (2012)	Italian Gas Transport – SNAM (2012)	Netherlands Gas Transport – Gasunie (2012)	Portugal Electricity Transmission REN (2011)
RAB Published by Regulator		No	No (Published by company)	No (Published by company)	Yes	No (Average RAB published by company)
Other Major RAB Regime Issues		Only equity funded proportion of assets acquired prior to the year of the price review is adjusted for inflation. Equity-funded portion capped at the lower of (i) actual equity and (ii) 40%, but based (unlike revenues) on asset specific price	Generally supportive legislative with predictable and stable AEEG regulatory track record	Generally supportive regulation	Major regulatory uncertainties introduced by (i) retrospective reduction of Gasunie RAB and (ii) reducing 2012-13 tariffs via an imposed one-off repayment of Gasunie’s fee charges levied since 2006	Regulatory stability track-record good, but some political interference in the past. ERSE has had tariff setting independence since 1999

		<p>indices (max 40% of assets).</p> <p>RAB only reviewed at price review not during a period.</p> <p>Planned enhancement investment fully remunerated separately.</p> <p>Unplanned investments only remunerated once added to RAB.</p>				
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Source: Moody's Reports summarized by J Stern

The table shows varying degrees of regulatory support for the RAB as an effective commitment device. In general, Moody's uses the UK regulatory regime as a benchmark for Europe in terms of stability and predictability of the relevant framework. In that respect, the Italian framework is relatively close to the UK framework, whilst the German framework is still comparably young and undergoing changes. It is also perceived as less transparent with the RAB not being published. The Netherlands would have got high marks if there had not been the major recent retrospective RAB and related reductions. Similarly, the assessment of the Portuguese framework is also affected by some political interference in the past.

5.3 RABs and Financing Costs³⁶

The question as to what effect RAB changes and ratings agency changes have on share prices and debt coupons is a difficult one. They are affected by a wide range of factors and are much more volatile than ratings. This suggests the need for sophisticated multivariate analysis to establish any robust effect.

However, there are some pointers to significant RAB impacts e.g. on share prices. The most convincing is the 10% increase in the Lattice (Transco) share price in 2001 when the RAB revaluation threat to pre-1997 assets was removed.

Another UK example is Severn Trent, an English water and sewerage company, whose share price initially fell by 3% following the publication of the proposed October 2012 Ofwat licence modifications. The proposed modifications were intended to signal preservation of past RAB rights and to limit future RAB reallocation effects, but they did signal Ofwat's commitment at least to investigating the possibility of further increases in competition after 2019. Rating agency reports (e.g. by Moody's) emphasized the problems and have suggested possible significant adverse effects on credit costs³⁷. The Severn Trent share price fall may, at least in part, reflect that.

A more spectacular example is for SABESP, the Brazilian water company, where speculation that its RAB value would be increased was associated with an increase in its share price of almost 100% over 2012. However, one might expect a larger impact of RAB changes on share prices in countries like Brazil where regulatory reputations are more fragile than in OECD countries

5.3 London Underground PPPs

One of the most persuasive pieces of evidence in favour of positive RAB commitment effects within the UK regulatory system comes from the London Underground PPP (public private partnership) contracts. These embodied the equivalent of RAB protection

³⁶ I am very grateful to Jonathan Mirlees-Black of RARE Infrastructure, Australia for assistance with this section.

³⁷ See, for instance, <http://www.globalwaterintel.com/archive/13/3/general/quantifying-effects-uk-water-reform.html>

for efficient assets (and their operation) but in an unfamiliar and much less transparent format than the Network Rail equivalent.

The cost of capital for the London Underground PPP contracts was 21% for Metronet and 26% for Tube Lines. These compare to the 2008 ORR setting of the cost of capital for Network Rail on its RAB of 4.75%. Of course, there were significant political risks with the PPP contracts and Network Rail is a company ‘limited by guarantee’ rather than a standard privately owned company. In addition, around one-third of Network Rail’s costs are covered by ongoing, regular and committed government subsidy. Nevertheless, the fact that the London Underground RAB was embodied in a special and rather different institutional setting seems to have made a major difference to its effectiveness as a commitment device³⁸.

6. Concluding Comments

This paper sets out the arguments why RABs can provide an effective regulatory commitment device for infrastructure industries and, in particular, for their networks. However, this seems to depend at least as much on the security of the regulatory setting within which they operate and are revised. The quality of that setting includes the effect of both formal, legal frameworks and informal experience e.g. on the transparency and consistency of regulatory decisions affecting the RAB and related financing issues.

The UK scores highly on these elements as, elsewhere in the EU as does Italy. Other countries do less well. The recent retrospective Netherlands decisions against Gasunie spoil an otherwise good record and it will be interesting to see whether and, if so, how long it will take for the Gasunie credit ratings and financing costs to recover.

It is not clear how far the UK experience can be reproduced in different environments. It evolved over a 20 plus year period after the privatization of the main British infrastructure industries. The RAB approach is by no means a panacea and ‘RAB-fetishism’ is not uncommon. Nevertheless, it does seem to have provided a useful safety net for keeping down the cost of capital for privately financed infrastructure investment and versions of it seem to have been successful in Latin America as well as in Australia – at least in countries with strong regulatory frameworks and track-records.

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³⁸ I am grateful to Chris Bolt for helpful information on the LUL PPPs.

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