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Charter Review price setting models - A rail and road comparison study

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Introduction

Like education, health etc. public service broadcasting (PSB) is a merit good rather than a public good service, as it satisfies only one of the two properties that define a public good: it is non rival. However unlike public goods, it is technologically feasible to exclude users from large parts of the service (although currently would be very expensive in the case of television and not possible for radio); whether the latter happens is a matter of public policy choice or, in the case of commercial broadcasters, company choice. As things currently stand, if a user only uses BBC's radio services, the web based BBC news and time delayed viewing of television programmes (the BBC iPlayer "loophole"), there is no obligation to pay a licence fee.

Public service broadcasting by the BBC is a "merit" good given the very large spill overs the use of this service entails - which would be under-provided in a commercial broadcasting only market. This no longer refers to any limitations on the supply side because of an 'infrastructure network' (spectrum) scarcity as it did in the past. Such limitations led to high barriers to entry that justified public intervention in PSB to ensure provision. Given the advent of digital television, a plethora of channels can be transmitted. This, combined with catch up TV, on-demand services, satellite, cable, and fast broadband means that there is no longer scarcity in spectrum or in the capacity of any other platform used to deliver content.

Given its mission, the BBC uniquely addresses licence fee payers not only as consumers, but also as citizens, provides services for users outside of this country for free (BBC World Service), and competes through its commercial arm (BBC Worldwide) internationally. In all these aspects of service the BBC has an impact on the UK economy. Public service goods principles typically include provision attributes such as universality, equality, accessibility, and affordability (if not free at the point of use). However in the case of the BBC additional principles need to be observed including the promotion of social cohesion, as well as impartiality and distinctiveness. In fact there are six broad purposes which the Government set in the current Charter that include the above principles, and imply large spill-over benefits: a) Sustain citizenship and civil society through informing, b) promote education and learning, c) stimulate creativity and cultural excellence, d) represent the UK and its nations, regions and

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communities, e) bring the UK to the world and the world to the UK and f) deliver to the public the benefits of emerging communication technologies and services.

The BBC's independence from the government is ensured by the fact that it receives its funding from the licence fee payers and hence it is ultimately answerable to them. To some extent this may defeat the principle of affordability in provision for some low income households; the licence fee is regressive and non-proportionate as it depends neither on the income of the user, nor on the degree of use of the service. On the other hand the payment of the fee by a very large number of people ensures a low per user price, partially restoring affordability. Moreover, it provides certainty in funding for the corporation, which allows it to take risks and invest in innovation and quality. It is also relatively easier and cheaper to enforce and collect.

The licence fee is compulsory for anyone who accesses live television programming irrespective of whether he/she uses this access to view BBC or other PSB programming funded by the licence fee. Coercion is not unheard of in public service markets, but legitimacy is required for this (this legitimacy requirement together with universality seems to be satisfied given a high willingness to pay at 73%, and the fact that 99% of households use the BBC each week [BBC, 2015, pp. 67-68]). For example, there is compulsory education up to the age of 16, some degree of coercion regarding childhood vaccination programmes funded by the state, etc. However what is rather unique is that while such services are free at the point of use, in the case of PSB there is compulsion in payment rather than in consumption². Compulsion in payment is common for PSB in other countries, for example Germany or Finland, where payment takes the form of a household levy – the latter leaves room for more progressive forms of payment allowing the levy to vary according to socio-economic factors such as income, size of household, etc. Price setting by an independent external economic regulator might ensure a stable source of funding that retains the independence of the BBC from the government while also protecting and promoting the interests of licence fee payers as citizens and as consumers funding the service.

The objective of this report is to look at the arrangements for the economic regulation of two public sector companies in rail & road, despite the difference in the funding approach. We analyse the regulatory framework in rail and roads for the infrastructure rail company Network Rail and the motorways and major roads company Highways England, both of which are non-commercial companies like the BBC (although both Network Rail and the BBC are recipients of commercial income as well). We explain the price setting and general funding arrangements in these two companies specifically and in the sector in general, and examine the role of ORR as an independent economic regulator advising the government on the funding of these two state companies by monitoring the cost efficiency of both, and using periodic review price setting to determine the access charges paid by passenger and freight rail operators to NR. We draw out some issues that may serve as lessons in price setting by a potential future independent external regulator advising the government on the level of BBC funding through price setting.

² The author can only think of compulsory motor insurance; the compulsion exists to prevent adverse selection where only bad drivers select to insure. This would cause a sharp increase in premiums by insurers wishing to reflect the increased risks of claiming by the insured who in their vast majority are high risk drivers. This will lead to a sharp reduction in affordability of car insurance prices. Hence the universality in motor insurance means that good drivers, who do not need insurance, subsidise bad drivers, who do, to prevent the market failure of under-provision in the market for motor insurance.

We highlight potential common themes emerging such as crowding out effects, single till versus dual till approaches, benchmarking and internal market arrangements.

Economic Regulation in the UK

Independent economic regulation was initially designed in the UK following privatisation to reassure investors in utilities regarding the returns on their assets. During the 1980s and 1990s telecoms, energy, water etc. were privatised. As investments in such industries typically have long lives and pay back over a long period, they needed to be assured that the returns from such investments would not be unduly subjected to day to day politics or changes in government. Apart from being a mechanism of assurance to the investors of such privatised utilities, regulators established a stable framework of an incentives based model of economic regulation under which investments are made. This ensured that such investments would promote the long term interests of the consumers by improvements in productive efficiency and then passing on the gains from productive efficiency to the consumers in the form of lower prices after a reasonable amount of time to allow investors a reasonable return.

More specifically, the price setting was based on the price cap regulation model (RPI-X) which tries to balance between the benefits of productive and allocative efficiency. The system sets a clear incentive for the regulated company to exceed the “X” efficiency target of cost reduction and pocket the extra savings for the duration of the periodic review, thus providing an attractive return from the achievement of operating costs savings in the short run (for the duration of a 5 year period), before passing on any costs savings, alongside any quality improvements to the consumers in the form of lower prices in the next periodic review. This trade-off process between productive and allocative efficiency imitates the process in a market where competition is effective. Investment is attracted by profits and eventually these profits are competed away as they translate into lower prices benefiting consumers, as it happens in a competitive market, albeit at the somewhat slower rate of a 5 year period, to allow for the long term nature of such investments. Hence, incentive-based regulation in the form of an RPI-X price cap imitates the competitive process by balancing between the need for short run profits to attract investment and productive efficiency and long run gains in allocative efficiency through lower prices.

Economic regulation agencies were able during their operation for more than 30 years to accumulate specialist expertise far greater than any mainstream government department, by becoming depositories of expertise knowledge. The independence of the regulators was underpinned by the fact that they were funded by levies on the respective industries they oversaw. Their personnel moves around the regulator body enhancing their knowledge on a specific sector, whereas mainstream civil service would enhance breadth rather than depth. In the earlier years, the regulators were given narrowly defined duties to promote competition where possible. Regulation was seen as a transition measure; the target was that as competition took hold in the most contestable parts of each industry, the regulator would increasingly focus on the network parts of these industries.

This process was kept in place until competition removed the need for ex ante price regulation as consumers become protected by the rigours of competition that induce producers to set

prices close to costs and by the enforcement of competition law protection through ex-post regulation. Typically, this was achieved by vertical unbundling that separated the contestable segments of an industry from the infrastructure parts with natural monopoly characteristics. This allowed the introduction of competition in the former and the continuation of price cap regulation and access pricing determination through period reviews in the latter. Hence competition flourished in the generation segments of gas and electricity as well as the retail parts of gas, electricity, telecoms, mobile operators, etc. This led to the removal of price regulation in such segments. On the other hand, networks in all utilities such as energy, telecoms, rail etc. that are still price regulated monopolies (e.g. National Grid, Network Rail), or regional monopolies (e.g. water companies in England, electricity distribution companies), or near monopolies (e.g. Openreach) are still subjected to increasingly complex price setting reviews and network access setting arrangements.

The opening of previously ex ante regulated segments to the forces of competition was reflected by the introduction of legislation that broadened the remit of many regulators by granting them concurrent powers to monitor and enforce competition in the sector each oversaw, in tandem with the Competition and Markets Authority (CMA, a body resulting from the merger of the OFT and the Competition Commission in April 2014). Both ORR and Ofcom, as well as the majority of regulators, were granted such concurrent powers.

The duty to promote competition is a duty to protect a process rather than a set of outcomes. In more recent years, while the government still adheres to the idea that independent regulation is essential for promoting predictability for investors, the nature of independent regulation has shifted from processes (such as promoting and enforcing competition, controlling or punishing monopolistic pricing etc.) to delivering specific outcomes desired by the government, many of which fall within the government's policy of delivering infrastructure (Tutton, 2014). To some extent this is reasonable. Developments in technology, combined with corresponding changes in the society and business requirements have led to a continuous evolution in regulated infrastructure to satisfy these needs. As a result, regulatory frameworks and policy objectives have changed to reflect the changes in priorities. An obvious example is the rapid platform convergence in broadcasting, where broadband has become an alternative platform to television, in the form of catch up TV, internet television (IPTV) and the emergence of over the top services rapidly blurring the lines between broadband and telecoms regulation, both of which are overseen by Ofcom. Given that the BBC is one of the direct beneficiaries of this convergence by enhancing its ability to reach audiences, and given its mission to promote for the benefit of the public emerging communication technologies and services, the BBC has agreed to contribute to the funding of broadband roll-out, although this funding is set to end under the latest licence fee settlement.

Across the regulated infrastructure sectors there is an investment requirement for regulated companies not only to maintain existing infrastructure but also to upgrade and build new infrastructure, especially in sectors where there is scarcity as we see below. For some industries, like rail and roads, this funding requirement is provided by the government: Network Rail (NR) is partially funded by the government, through a lump sum grant that represents more than 60% of its income, while Highways England (HE) is wholly government funded.

Economic regulators are not independent from the government but rather they act as agents of the government, who is the principal, and on the government's behalf they perform economic regulation in the form of price setting and promote competition as appropriate. Ultimately they exist to champion the interests of present and future consumers. The government sets ex ante the broad guidelines for the regulator in the form of high level outcomes that need to be achieved during a set time framework, but not how these should be achieved, as this will be determined by the sector with the regulator at the helm monitoring and enforcing compliance. So the government guidelines to the regulator for what should be achieved should be outcomes based, rather than inputs or specific outputs based. More specific and/or more frequent instructions from the government to the regulator, in terms of what the latter is meant to achieve focusing in the form of specific outcomes/projects can both undermine the process of regulation and the independence of the regulator, and therefore the credibility of the process itself.

Rail and Road Regulation

The Office of Rail and Road (ORR) is the independent safety and economic regulator for Britain's railways and the Highways England monitor. Its duties involve the application of ex ante price regulation on Network Rail (as well as HS1, Channel Tunnel, Northern Ireland, Crossrail, Heathrow). ORR also sets the outputs that NR needs to deliver (regulatory outputs) (train service reliability, network enhancements and maintenance, health and safety), and overlooks funding arrangements (track access charges, network grant and other single till income from property, stations, car parking etc.). It has the role of protecting rail consumers' interests and rights, has concurrency powers (ex post regulation) and a role in the development of European rail markets and regulation. ORR is responsible for track access charges arrangements and open access (i.e. introducing competition between train operators in parts of the rail network, see below) and is responsible for accountability and efficiency monitoring. Finally as we mentioned above, the ORR assumed in 2015 the additional role of acting as the efficiency monitor of Highways England.

Competition in rail was introduced through the privatisation of British Rail in 1994, following vertical unbundling of the company into 4 different parts, the infrastructure network, passenger train operators, freight operators, and ROSCOs (rolling stock operating companies) described in turn below.

The infrastructure network Railtrack, was a group of companies that owned the infrastructure network (the tracks, stations, signalling, shops, etc.). In 2002 Railtrack went effectively bankrupt after experiencing major financial difficulties and most of its operations went to Network Rail, a company limited by government guarantee (did not distribute dividends). In 2014 the Office of National Statistics (ONS) announced that Network Rail was to be classified as a central government body in the public sector in compliance with the European System of National Accounts 2010 which came into force across the EU in September 2014. Following its reclassification, NR's net debt passed on the government books and the company is no longer able to borrow from the capital markets. The Government has assumed a new role in agreeing material changes in NR's business plan following a loan agreement that puts an

absolute cap on NR's funding and poses questions as to whether the company will be able to deliver its outputs within the cap.

NR is a monopoly network that receives income from track access charges, e.g. income from train operators and freight operators for access to its infrastructure, a lump sum grant from the government, and income from its commercial operations (e.g. property income, see below).

The government separately for England and Wales, and for Scotland specifies what it wants to buy through the high level output specifications (HLOS) and statement of funds available (SoFAs). The ORR must confirm if the HLOS are affordable given the funds available. The HLOS, SoFAs, financial incentives and selected customer requirements are inputs into a building blocks approach for the periodic 5 year review of NR, which translates these into costs and from this derives the gross revenue requirement of the company to deliver the set outputs and determine various things including access charges for freight and passenger train operators. We discuss this in more detail in the single till vs. dual till approach below.

The business of carrying passengers was given to different train operators, in the form of franchises running designated routes into the network thus introducing competition for the market, rather than in the market. The franchises are granted by the Department for Transport (DfT), while ORR is responsible for enforcing the licences. The owners of such franchises became regional monopolies in a designated part of the track for the duration of the franchise. Passenger train operators do not own their trains; instead they lease them from the ROSCOs, which were also privatised in 1994. Train operators pay the government for franchises and receive money from the government to subsidise access charges. Franchises enjoy significant protection from changes in track access charges (a protection that open access operators, discussed below, do not have), but have limited flexibility as the franchise arrangements are highly specified.

A small part of the passenger rail network is also open to competition in the market (open access). On the East Coast Main Line (ECML) there are two operators: Grant Central and First Hull trains. The existence of competition has led to substantial benefits by the route experiencing an almost double increase in passenger journeys (47%) compared to that in routes with no competition (27%), a larger increase in revenue by ten percentage points, a smaller increase in average fares, while ECML operators top the list of passenger operators for passenger satisfaction (Lodge, 2013). More recently there has been more open access entry. Unlike franchising, ORR is responsible for open access route approvals in existing or new routes. Applications for open access in existing routes need to successfully make the case that entry will generate rather than divert traffic from the existing franchise holding operator. Any approval needs to ensure that there is no "crowding out" impact from the introduction of competition in the route and that the entry will have positive spill over effects by an increase in overall demand through an increase in passenger journeys and revenue, as well as an increase in passenger satisfaction. A NPA ("non-primarily abstractive") test is used with a threshold of at least 30p new revenue generated to every pound extracted away from the incumbent operator, which along with the dynamic effects of competition should lead to an increase in consumer surplus while allowing a financially sustainable operation for both companies. In addition any approval needs to ensure that the introduction of new services will not have an adverse impact on punctuality or create congestion into the network.

Unlike passenger train operators, there is strong competition in the freight market. This has led to improvement in investment and productivity leading to a reduction of unit costs by 35% between 1988/89 and 2008/09. Freight operators pay access charges too and unlike franchise holders of passenger trains have less protection from changes in access charges but receive indirect subsidies.

As the rail track is mixed usage accessed by both passenger and freight operators it is difficult to allocate costs and internalise benefits for companies; as a consequence NR is not responsive to the needs of its customers. A further reason for this is the fact that a big chunk of the government money goes to the NR in the form of a lump sum grant instead of being given to operators to buy services from NR. Therefore there is limited alignment of incentives between NR and the train operators and no clear view of what is paid for by the government. This raises the question of whether government subsidies should go directly to train operators, whose revenues are more closely tied to keeping passengers satisfied. The creation of a proper market between NR and its customers would introduce a sensible commercial framework for buying and selling which would incentivise both sides to keep costs down. It would also introduce cost transparency into the system as the re-direction of the lump sum grant into the form of direct train subsidies would involve raising track access charges, which are currently artificially much lower than they would have been if they reflected NR's true costs (Rail Delivery Group, Review of Charges, May & November 2015).

Single versus Dual Till Issues

The “single till” and the “dual till” approach in economic regulation refers to the treatment of revenues that arise as a by-product of the company's primary economic activity which is price regulated. These two terms are most familiar in the context of setting aeronautical charges, if the airport's charges to airlines are regulated because the former has substantial market power, as is the case of Gatwick and Heathrow. Airports enjoy profits from commercial activities (retail space, car parking, etc.) as well as from aeronautical charges (typically including aircraft take off, landing, parking, terminal services, processing and screening of passengers). The UK airports regulator uses a single till regulation approach. The Civil Aviation Authority (CAA) considers that this better mimics what would normally happen in a fully functioning competitive market. To determine a fair price the regulatory till is determined by taking the total airport costs *less* the non-aeronautical revenues arising from commercial activities. On the other hand, the dual till approach sets the regulatory till as equal to the total airport costs *less* the non-aeronautical costs. (Frontier Economics, July 2014).

A single till approach has merits as it seeks to emulate how competitive airport operators make price offers to airlines by taking into account retail and other revenue in deriving a net revenue requirement to be recovered from aeronautical charges (CAA, 2010). So it has the merit of keeping such charges low and this translates into lower ticket prices and hence allocative efficiency in the form of lower prices for passengers. A dual till approach on the other hand separates the commercial from the aviation-related activities of an airport. Such an approach may be preferable if encouraging investment in airport capacity is of primary importance. However unless the airport is properly price regulated, a dual till approach would essentially

imply a transfer of income from airlines and their passengers to airports leading to allocative inefficiency.

Unlike airports, NR is a state owned company. ORR currently applies a single till approach in determining NR's gross revenue requirement. The company has a substantial property & shops portfolio (it is the biggest small and medium enterprise landlord in the UK) and this generates 10% of its revenue. So in addition to receiving the government grant and the access charges it has commercial income. Using a building blocks approach, the gross revenue requirement is determined as the sum of operating expenditure (i.e. opex which includes support, maintenance and operations costs), an amortisation allowance (set from capital expenditure (capex) consisting from renewals and enhancements costs; this translates into the Regulatory Asset Base (RAB) which in turn determines the amortisation allowance) and allowed return. Commercial income is then subtracted from the gross revenue requirement of the company, leading to a lower funding requirement. This translates into lower track access charges or/and into a smaller network grant by the government.

As we discuss below in benchmarking, there are serious questions regarding the cost efficiency of NR in the beginning of the previous regulatory period (Control Period 4, CP4) and also in the first year of CP5. Equally there are issues regarding NR's ability to deliver infrastructure projects on time. The question is whether given that NR is a state owned company (and therefore any profits from commercial activities will in any case enter the government books), a dual till is a better approach rather than the existing single till approach. A dual till approach may be a more effective instrument in stimulating more investment in increasing capacity, and providing a better incentive to minimise costs. As the company will be regulated on its rail costs, this will deprive NR of the "cushioning" effect of income from non-rail revenues and allow the regulator to set an effective incentive regime to drive improvements in cost efficiency. However it is more information demanding as it requires that shared and common costs should be split between rail and non rail related activities.

Currently the BBC receives £3.7 billion as funding from the TV licence. It has income from commercial activities which comprise of:

- a) Its commercial subsidiary BBC Worldwide which - with the exception of large US studios - is the world's largest distributor, and sells BBC content both in the UK and the rest of the world. Its revenues are around £1 billion per year. BBC Worldwide is able to access finance in the capital markets; however as it is subject to public bodies' spending rules, BBC Worldwide has a government imposed borrowing limit of £350 million, which acts as a brake on the company's ability to break big and expand in large overseas markets as in the US (DCMS Charter review, p. 123).
- b) The BBC generates around 90 million revenue from selling global news
- c) BBC studios and post production services which it rents out.

As mentioned earlier BBC Worldwide sells both its own in house content as well as that of independent producers of BBC commissioned content. The profits are reinvested in the BBC to pursue its public purposes. In 2014 Worldwide returned £227 million to the corporation.

One of the practical issues that an independent external regulator will encounter in a price setting exercise - which would require it to calculate the size of the regulatory till and therefore

the licence fee itself - is to determine which of BBC's revenue raising activities are core (i.e. directly linked to those funded by the licence fee and hence under economic regulation) and which are not. This is because BBC Worldwide sells BBC's content domestically and abroad as well as transmitting it through BBC's 9 domestic TV channels and online. Hence the question arises how to treat commercial revenues that arise from content financed by BBC's regulated activity of content production for which it receives licence funding. This is crucial for price setting (i.e. licence fee) setting purposes. This is *in addition* to deciding whether a single or a dual till approach will be followed.

If the BBC is economically regulated in its price setting by an external independent regulator who chooses a dual till approach, its commercial profits (which, given the above discussion, may be determined as all commercial revenue, or only the part of it that accrues through the revenues from non-licence fee financed content) will be subtracted from the regulatory till. This will imply a larger funding requirement by the corporation translated into a higher television licence fee. On the other hand, a single till approach simplifies income separation issues as all commercial income is subtracted from the regulatory till. This results into a much lower funding requirement for the corporation and hence a much lower licence fee. On the other hand, a dual till approach will give BBC the opportunity to use this commercial income to invest more on its content, quality and innovation. The allocative inefficiency argument arising in a dual till arrangement no longer holds, as the corporation is an independent state company. Consequently, its objectives are public interest objectives, not profit maximisation as is the case in price regulated private companies such as airports, electricity transmission and distribution companies, water companies etc. So the former trade-off transforms itself into a dilemma between short run static benefit for licence holders through lower prices today versus dynamic benefits through enhanced services tomorrow. In other words, in the former case commercial revenues lead to reduction of the licence fee while in the latter (dual-till) case the BBC is allowed to keep these profits for further re-investment in promoting the six broad purposes mentioned in the introduction. Provided that the independent external regulator monitors the cost efficiency of the BBC through benchmarking, overspending by the corporation will be prevented by providing a link between benefits and spending as set out below.

Domestic and International Benchmarking

Benchmarking is a regulatory approach to assessing the cost efficiency of a company that does not operate in a competitive market. Benchmarking both identifies whether a firm is cost efficient relative to its peers as well as whether there is scope for cost efficiency improvements³ and also can identify through comparison technologies and working methods that will allow the company to improve its productive efficiency. It also an essential ingredient in determining whether the target for costs savings over the control period, which will ultimately feed into the setting of prices, is both challenging and feasible by assessing the efficiency of the maintenance and renewals spend of the company. NR mainly outsources its enhancement work, uses a mix of outsourcing and in house renewal work, and does maintenance in house. International benchmarking has revealed that there are significant differences between NR and best practice international comparators in procurement (contracting) and possessions strategies where NR lags behind international best practice.

As NR is a monopoly provider of track network this means that unlike say, electricity distribution firms, there are no domestic comparators to construct an efficiency frontier analysis. Instead for measuring its efficiency, ORR performs international benchmarking using data from European mainline infrastructure managers, comparing NR's maintenance and renewal efficiency to that of other rail infrastructure companies in Europe.⁴ This makes the benchmarking work more challenging, as the analysis has to ensure that the comparisons are based on a like-for-like basis (ORR, 2010).

The variables used for econometric cost benchmarking include cost data (total maintenance and renewals costs, excluding enhancement costs), output data (passenger train km, passenger tonne km, freight tonne km, tail tonne km, and total train km) and network features data (main track or route km, ratio of single track to track km, proportion of track electrified, number of switches per track km and stations per route km).

The 2008 periodic review which set out NR's outputs and funding levels for the 5- year Control Period 4 (i.e. CP4, 2009-14) used benchmarking which indicated that NR was around 40% less cost efficient than its top performing peers, while there was scope for an improvement by at least 21% in terms of efficiency improvement during the control period. This gap in efficiency was confirmed by a 2010 update using state of the art econometric modelling which showed that "... in 2008 NR was between 34%-40% less cost efficient than the top European

³ ORR's efficiency assessment for NR for 2009-14 (Control Period 4) included 3 elements: catch up efficiency, frontier efficiency and input price inflation (ORR, 2010). The catch-up element is related to the expectation that NR can catch up to the levels of performance of the more cost-efficient companies in its peer group, while the frontier shift element is related to the expectation that over time, in addition to catch up NR should be able to improve its cost efficiency over time as all firms do. The first part is referred to in the economic literature as an increase in pseudo efficiency (i.e. a reduction in cost inefficiency) and the latter as a pure efficiency increase resulting from innovation and technological change, shifting the production frontier outwards.

⁴ International benchmarking uses the LICB (Lasting Infrastructure Cost Benchmarking) data set compiled by the International Union of Railways. The datasets comprised maintenance and renewals costs and other data for a total of 14 European rail infrastructure managers (of which 12 are used) including NR.

infrastructure managers in the peer group”⁵, which broadly confirmed the earlier result and the McNulty (2011) report on the efficiency of the rail industry as whole. The efficiency gap mostly stems from NR lagging behind its peer group in activities associated with procurement strategy (contracting) and possessions strategy.

The 2013 periodic review (PR13) which used more recent models of efficiency and employed a wider range of models showed a NR efficiency gap from 13% to 25% which indicated an improvement, but also ample room for further improvement to reach the 40% in Control Period 5 (CP5, 2014-19). Unfortunately the annual efficiency assessment for the first year of the period, i.e. 2014-15, showed a reduction of 2.3% rather than an improvement in England and Wales relative to the previous year, while NR in Scotland was 1.1% less efficient than in the prior year. Efficiency shortfalls were in part due to renewals work costing more than expected, including for track, signalling and civil structures.

ORR has also recently taken on the role of the efficiency monitor of Highways England (HE) which is a Central Government Company wholly funded by the state. ORR will be paid for its monitoring role by the government, unlike rail where it is paid for its role as a safety regulator by all companies operating in rail (including passenger train operators, both franchise holders and open access, freight train operators, the London Underground, NR etc.) and by the NR through its licence fee for its role as the economic regulator of NR. As a roads monitor its role will be primarily economic and less on safety, unlike rail where the ORR is the health and safety regulator for the whole industry. Moreover, unlike rail, there is no price setting as the road network is free to users at the point of use. Finally its geographical scope is smaller as, unlike the rail network, HE only manages the road network of England. Hence the funding requirement for regulating the HE is significantly lower than in rail. On the other hand, the ORR will draw on the synergies between road and rail functions and will benefit in its role as monitor through its experience on rail by developing a joint up approach to enforcement and by drawing on expertise across the ORR in terms of asset management, safety management, efficiency monitoring and benchmarking. (ORR, 2015, pp. 26-27)

Highways Agency became a government owned company, Highways England in 2015, through the Infrastructure Act 2015. It owns motorways and main ‘A’ roads. The government sets out the requirements in the form of the Road Investment Strategy (RIS) and the five-year statement of funds available (SoFAs). Unlike the NR, HE has no further sources of income as the use of roads is free in England with the exception of the Dartford crossing tolls. ORR is responsible for promoting performance and efficiency in HE. As part of its monitoring duties the ORR should ensure delivery of the RIS, the outputs in the performance specification and the deliverables in the investment plan, oversee financial performance and efficiency and enforce the RIS and licence. It should also advise the government on any proposed future RIS in terms of whether it is sufficiently challenging but also feasible to achieve given the level of funding set by the government.

In order to inform the future road investment strategies, ORR will need evaluate through the use of benchmarking the company’s efficiency to ensure value for money. The road users and those affected by the road network are to be represented by Transport Focus. While the DfT

⁵ Efficiency benchmarking of Network Rail, ORR, <http://orr.gov.uk/what-and-how-we-regulate/regulation-of-network-rail/how-we-regulate-network-rail/periodic-review-2013/pr13-publications/efficiency-benchmarking-of-network-rail>, last accessed 14 December 2015.

will be responsible for setting the RIS, it will do so with input from the efficiency review of ORR and it may need to vary the RIS if required. Once the RIS is finalised, ORR will monitor and enforce its implementation by HE.

Benchmarking on roads will need to focus on costs and outcomes, and to identify potential peers for benchmarking purposes. The ORR hopes to set benchmarking on the basis of comparators in other jurisdictions within the UK such as local authorities, as well as the infrastructure managers for Scotland, Northern Ireland and Wales. It will also do within benchmarking by comparing managerial approaches in different geographical locations, comparing specific functions of HE (such as IT) with comparators from other industries, as well as perform international benchmarking with international road infrastructure managers.

The Key Performance Indicators (KPIs) and Performance Indicators (PIs) as set in the monitoring framework document (ORR, 2015), are linked to components of monitoring and set targets where appropriate (Table 3.2. pp. 22-23) for the Performance Specification (e.g. number of fatalities, network availability, noise, cost savings, delivery plan progress, roads condition, etc.), the Investment Plan (delivery plan progress in investments, maintaining and renewing the network, and on ring-fenced investment funds such as environment, safety, innovation, air quality growth and housing) and licence compliance by HE.

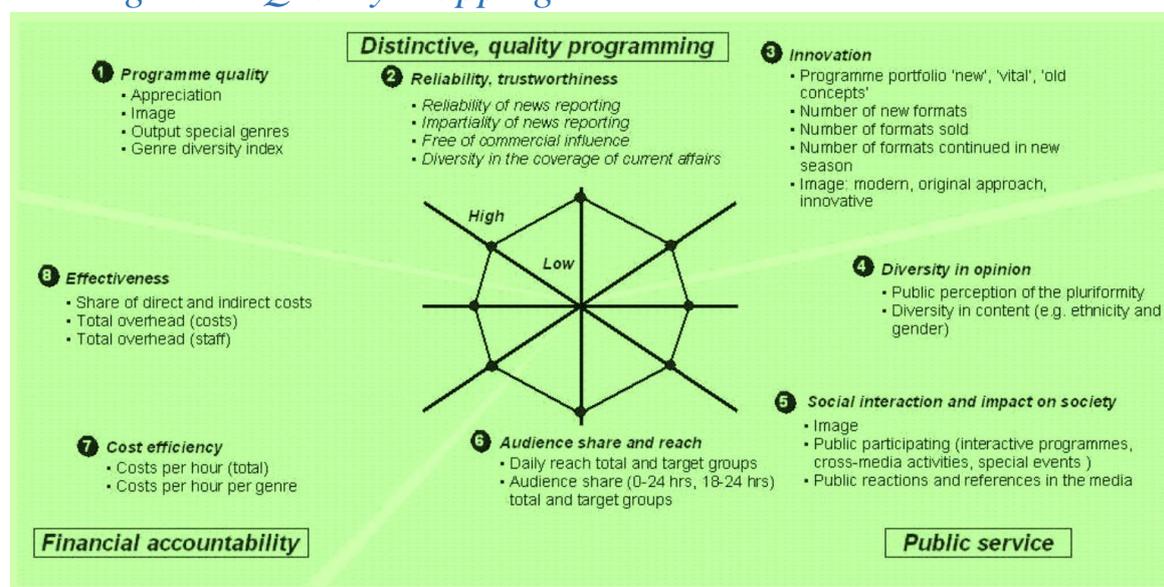
The role of Transport Focus is to feed into the process the road users' feedback in terms of satisfaction rates, priorities on improvement and getting industry buy-in for action on behalf of the users. User feedback information on motorways and "A" roads is collated by categories: haulage (HGV) drivers, car and van drivers, as well as motorcyclists. This is because there are differences in the priorities of, say HGV drivers, where the quality of the road surfaces is a top priority (in fact this is a top concern for all user categories), as well as better management of unplanned delays such as accidents and breakdowns, and better managed roadworks, while the other categories of users place more emphasis on safer design and upkeep of roads, better behaved drivers, as well as comfort in driving, less noise, safety in poor weather. ORR will use such feedback in so far as it relates back to the KPIs.

Unlike NR and HE, the BBC is not a monopoly neither in broadcasting nor in content provision. It competes domestically with other commercial PSBs (ITV, Channel 4 and Channel 5) as well as over 70 channels in Freeview, satellite and cable providers, as well as television over the internet offerings such as Netflix, Amazon Prime etc. In a similar way to Transport Focus which collects and collates user feedback by types of road users, an audience watchdog agency should collect information on broadcasting evaluation by the public as the BBC Trust currently does. It is possible to have separation by categories of audience⁶, type of programme, broadcaster organisation and channels. According to van Meurs et al. (2006), it is possible to construct a quality mapping for the PSB system in a country in order to use as an instrument to compare among PSBs. This requires the spelling out of PSB's range of services and the specific categories of audience it serves. The paper sets 8 dimensions as can be seen in Figure 1: programme quality, reliability, innovation, diversity in opinion, social interaction and impact

⁶ In Netherlands, the Dutch Audience Research identifies categories of audience served by its state PSB channels (such as ambitious pleasure seeker, comfort seeking citizen, concerned citizen, participating citizen, firm believer, tolerant world citizen, carefree thrill seeker and concerned educator) by asking the sample audience questions regarding norms and values, interests, leisure activities, etc. and then finds the audience share of each PSB channel by life style group.

on society, cost efficiency and effectiveness. A quality mapping of television programmes can be performed by using the first six dimensions to evaluate the degree of appreciation of the audience sampled for different types of television programmes (news & current affairs, factual, sport, fiction etc.) in each dimension. On the other hand, cost efficiency and effectiveness can be compared between PSBs through the use of benchmarking techniques as discussed above for the case of rail and roads. It is also possible to measure the distinctiveness of a PSB by comparing the degree of genres balance (news and current affairs, factual, sports, drama, soaps, entertainment, comedy feature films) to show distinctiveness in provision in relation to commercial comparators.

Figure 1: Quality Mapping



Source: Fig. 3, p. 4, van Meurs et al., 2006.

Benchmarking can be used to measure BBC's cost efficiency relative to its domestic commercial competitors. It can also feed into of the corporation's price determination periodic review performed by an external independent regulator, by setting a capped price in a way analogous to the methodology used by ORR in setting the RAB for NR, in a way that is both challenging for the company to induce further cost savings (dynamic efficiency gains) as the BBC strives to beat its price cap, as well as financially feasible and realistically set for the company to allow it to invest in quality and innovation.

Similarly to what we have seen in rail and roads, a broadcaster can both set and measure performance through Key Performance Indicators. According to Barbuio (2008) KPIs in public broadcasters should be strategic/operational, result drivers (i.e. leading to output and/or outcomes), lead/lag (i.e. allowing for measures that are predictive of future performance) qualitative/quantitative (e.g. amount of television output by hours and by genre, quality of outputs by awards and audience feedback, etc.), and effectiveness/efficiency measuring whether the broadcaster meets its licence obligations and how efficiently available funding and resources are used to maximise outputs to ensure value for money. The paper stresses that good

KPIs should be controllable/accountable, relevant, verifiable, quantifiable, timely in informing decision making, accessible and cost effective to collect.

The unique nature of the BBC as a broadcaster being non-commercial and funded by the licence fee means that it should not be benchmarked against commercial broadcasters only. It would also be useful to compare to broadcasters in other countries through international benchmarking. This reveals whether performance compares favourably to international peers or whether it can be improved using best practice as seen by broadcasters in the peer group.

International benchmarking KPIs should share comparable metrics on key outputs, functions or processes in terms of effectiveness and efficiency as Table 1 indicates. By sharing such comparable metrics, through the use of benchmarking econometric techniques as already discussed for rail and roads, an independent external regulator will acquire additional information on the cost efficiency of the BBC relative to the corporation's international PSB peers and hence one more very useful instrument for measuring cost efficiency and for price setting, in addition to the information from benchmarking using domestic comparators.

Table 1: Effectiveness and Efficiency Metrics

Effectiveness	Efficiency
% of National Content	Cost per production hour
Reach	% of overheads against total expenditure
% of Output hours (broadcast) by genre	Cost per broadcast hour
	Cost per consumed hour
	Cost per viewer/listener
	Utilisation of production resources
	Output per employee

Source: pp. 19-20, Barbuio, 2008.

Conclusion

We have looked at how the ORR, an independent economic regulator, regulates rail and road, and in particular the two state companies, Network Rail and Highways England. The sources of funding for these two companies are different with the main component coming from the government, whereas BBC is funded through the licence fee, and therefore independent. We report on the main features of the economic regulation of NR and the economic monitoring of HE, to study the lessons of ex ante and ex post regulation. We note how the ORR regulates these two companies; in the case of NR it determines through the periodic cost review access charges and, through monitoring NR's cost efficiency using international benchmarking,

advises the government whether the company can realistically deliver the set outcomes given its funding. It will also advise the government on the funding requirement of HE and will benchmark the company using alternative groups of comparators to ensure that the HE delivers best value for money. We draw out and discuss the common themes of benchmarking, single and dual till approaches, crowding out effects and internal market operation in rail and roads, and explain how this relates to the BBC in the case that it is regulated by an independent external regulator.

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