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Rowland Hill and the Economics of Cross-Subsidy and Competition

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Rowland Hill (1795-1879) was a polymath active in public affairs in the United Kingdom for most of the nineteenth century. He began, at a very young age, as an educationist, effectively managing an innovative school established by his father. This experience instilled in him a life-long passion for education. Later he was inspired by Edward Gibbon Wakefield in the quest for planned settlement in the New World, and was engaged as Secretary of the South Australian Commission from 1833 to 1839, working with Robert Torrens on this novel project. While serving on the Commission, he wrote his famous pamphlet, *Post Office Reform; its importance and practicability*, that was published in 1837. He later was appointed to a senior Treasury position to enact a compromised version of his own postal reforms, which included the introduction of the legendary 'Penny Post'. Later he was made Secretary to the Postmaster-General (1846-1854) and then Secretary of the Post Office (essentially the 'chief executive officer') from 1854 to 1864. Amongst other things, Hill was also involved with railroads, specifically as Chairman of the Brighton Railway Company (1842-1846). He was a Member of the Political Economy Club and met with famous economists such as John Stuart Mill and Edwin Chadwick. Rowland Hill's contributions across these various fields were recognised and celebrated by British society and intelligentsia. For example, he was made a Fellow of the Royal Society and was awarded an Honorary Degree by the University of Oxford. The British Government honoured him by bestowing a Knighthood in 1860 and he received the rare privilege of burial in Westminster Abbey in 1879.

This short paper focuses on Rowland Hill's contributions to economics, especially as applied to 'utilities' (providers of infrastructure services such as rail and post). A century later, the Nobel Laureate, Ronald Coase, recognised Hill's contributions in three papers published in leading economics journals in 1939, 1947 and 1961. In the first of these three papers, titled 'Rowland Hill and the Penny Post', Coase (1939, page 424) paid Hill this compliment:

> [This] account of the economic doctrines underlying Rowland Hill's proposals … afford[s] an interesting example of the deductive method being applied to the pricing problems of a State enterprise and for this reason they should be of interest to academic socialists.

In his 1947 paper, 'The Economics of Uniform Pricing Systems', Coase described Hill as 'an economist of considerable stature' (1947, page 140). Coase's 1939 and 1947 articles explain in detail the significance of Hill's contribution to utility economics, particularly on the principles to be applied for the avoidance of cross-subsidy. Coase unequivocally sets the record straight about what Hill actually proposed in relation to utility pricing, as opposed to what many people thought Hill had advocated. That is, Hill did not favour uniform geographic pricing, except in the unrealistic circumstance where costs are uniform.[1] And Hill was firm on another issue over which there was and is some misunderstanding – he did not support statutory monopoly for utilities such as the postal system. This was based on sophisticated arguments about the inefficiencies it entails and on the positive attributes of competition. Coase makes this clear in his 1961 article in *The Journal of Law and Economics*.

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[1] James Campbell is another who has emphasised what Rowland Hill actually believed, rather than what he is often said to have believed and advocated. See, for example, Campbell (1991), where he applies Hill's principles to international postal services.

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The Fundamentals of Hill's Reform Plan

The postal system of the late 1830s that Hill critiqued was characterised by: government ownership and operation through the Postmaster-General's Department; statutory monopoly protecting it from competition; a very high price level including a large 'taxation' element; a complex structure of prices with a plethora of different rates; and a cumbersome system of post-payment (receiver pays) for most items carried.

Hill's empirical and theoretical analysis of the operation and performance of the Post Office was thorough and perceptive. For example, Hill observed that demand for postal services had been stagnant for a period of twenty years and analysed the causes of this malaise in a sophisticated manner. He contrasted this lack of growth in demand for postal services with the rapid growth in demand for other goods and services. He also observed that the demand for postal services had not increased along with the substantial growth in both population and the economy. He also related the lack of growth to the fore-mentioned high prices which Hill described as 'oppressive' (page 6).

The postal system that emerged after the reforms were effected was very different from the old system, although the features of government ownership and statutory monopoly did not change. The new system envisaged by Hill involved: a great reduction in price; a move to a uniform charge for what Hill called the Primary Distribution ('the transport of letters, &co., from post-town to post-town throughout the United Kingdom, and the delivery within the post-towns', page 12); a move from post-payment to pre-payment for postal services; drawing a sharp distinction between the Primary Distribution and the Secondary Distribution ('that distribution which proceeds from each post-town as a centre, and proceeds to places of inferior importance', page 12); and elaborate arrangements to avoid what is now called 'cross subsidy' in the Distribution.

Overall Reduction in Price

The weighted average price of letters and other postal items was exceptionally high, and Hill attributed the stagnancy in volume over decades to this price impediment. The prices were well in excess of the 'natural cost of carrying a letter' (page 11) because they contained a large taxation component estimated by Hill as 'about 200 per cent on the natural or untaxed cost of postage' (page 7). Hill's plan involved removing that taxation component completely, such that the revenue generated would just cover all of the costs.

Hill's analysis of the effects of the overall reduction in price on overall volume can be found throughout his pamphlet (most detailed in pages 83ff), and the analysis is meticulous and well-informed. Hill draws on the experiences where other items have been substantially reduced in price (examples include coffee, tea, silk goods, and cotton goods) and the experience in other countries. He also explores the different segments of the market, and highlights how his plan will substantially eliminate contraband mail services. Hill estimated that his reforms would generate such a great increase in letter volumes, that the 'reduction in postage to a considerable extent would produce an increase in revenue' (page 10).

Move to a Uniform Charge for the Primary Distribution

Hill began with a plethora of different charges depending, inter alia, on distance and geographic location, with the lowest rate being two pence (in London) and with the many rates for other routes being higher than that. Hill's plan was to bring all items of a standard weight carried in the Primary Distribution (postal articles collected, carried and distributed within and between Post Towns) back to just one penny per item. This was based on a careful assessment of the Post Office's costs and predictions about what would happen to demand – Hill expected a 'five-and-a-quarter fold increase in chargeable letters' and a 'four-fold increase of business' (page 63).

Move From Post-paid to Pre-paid

The third element of Hill's pricing reforms was the move from post-payment (receiver pays) to pre-paid (sender pays). Hill made a detailed critique of the post-payment system, concluding (page 24) that pre-payment will have an 'enormous effect'. Hill goes on to identify the 'great desideratum … that the payment of all letters should be in advance' (page 29). In practical terms, this meant that postal users would need to pay for the carriage in advance (either buy a stamp or otherwise pre-pay), necessitating the Post Office to facilitate such pre-payment. This was a new and novel function. At the delivery end of the process, 'letter carriers' (that are now referred to as 'postmen' and 'postwomen') were relieved of the need to collect postage from recipients, and were therefore enabled to deliver many more items in a given amount of time (see pages 25ff). Hill was meticulous in the analysis of the cost implications of pre-payment, with a clear indication that the additional costs of posting would be less than the cost savings on delivery. Coase (1939, page 430) applauded Hill's 'advocacy of pre-payment [which] was, of course, of extreme importance'.

Secondary Distribution

The fourth element of Hill's reforms was the proposed creation of the 'Secondary Distribution' comprising the villages and rural areas outside of the Post Towns).[2] Hill reckoned that the costs of providing the service in the Secondary Distribution are high, and at prevailing prices, this resulted in a loss – 'In the present state of things, the distribution of letters is in some places a source of loss'.

Hill then asked 'whether one part of the distribution shall be conducted at the expense of the other part?' His answer to that question was 'no', 'this appears to me to be undesirable; every branch of the Post Office ought, in my opinion, to defray its own expenses'. In order for the secondary distribution to 'defray its own expenses', it should be extended 'to every place to which it can be conveyed without *injury* to the Revenue' (pages 56-57). Hill's approach was further explained (page 55) by the specification that the secondary distribution should include 'every place that can be reached without absolute loss to the revenue'.

This was not only a matter of charging a higher price for the service in the secondary distribution – Hill also suggested a lower delivery standard (for example, delivery only on alternate days) in remote areas. As described by Coase (page 430), Hill's plan was for:

> a secondary distribution which was to bear an additional charge. Hill's view was that each branch of the service ought to be self-supporting, as doing otherwise would be 'swerving into the unsound and dangerous practice of protection'.

Hill's plan (page 58) was that the postal service in any district in the Secondary Distribution would be organised as follows:

> Guardians of the Poor or other recognized authority be entitled, on paying a small annual fee to the Deputy Post-Master of the town to which the letters are dispatched, to require that a bag be made up for the district; and let them arrange for fetching and carrying the bag, and for the delivery and carrying of letters, charging the expense …. upon the Parochial rates, or upon each letter.

Hill considered this scheme very carefully, including the possibility that the local authority 'declined or neglected to act' (page 59) in which case the Post Office would 'empower to make arrangements for secondary distribution'. Hill expected however, that the Postmaster-General would be 'relieved of nearly all care' (that is, not be required to intervene).

The underlying ideas for Hill's analysis of the arrangements for the secondary distribution are now common-place but were novel and highly sophisticated in the 1830s. Nowadays, these key concepts are referenced back to a seminal paper on cross-subsidy by Gerald Faulhaber (1975) that reflected work that had been undertaken at the Bell Laboratories in the United States in preceding years. Faulhaber's co-workers included Stephen Brown and David Sibley (see for example, Brown and Sibley, 1986). William Baumol and David Bradford (see for example, Baumol and Bradford, 1970) were also associated with Faulhaber. The key cost concept is 'incremental cost' and cross-subsidy can be avoided by ensuring that, for each service, revenue covers at least the (long-run) incremental cost of providing it.[3] Hill depicted this as a requirement that the service is charged sufficiently 'to defray its own expenses' or that it be provided 'without absolute loss to the revenue'.

Abandonment of the Distinction between Primary and Secondary Distribution

Rowland Hill was forced to compromise in order to achieve the other elements of his radical plan. In particular, the compromised reform plan that was actually enacted did not proceed with Hill's proposed arrangements for the Secondary Distribution – the pre-paid uniform price (of one penny per letter) was made applicable for all letters, including those in the areas described by Hill as the 'Secondary Distribution'.

Coase devotes a lot of attention to the compromise, expressing his concern for Hill himself and for its consequences for utility pricing. On the former, Coase (1947, page 140) observes that Hill later 'deplored the abandonment', and on the latter (Coase 1939, page 435) he observed as follows:

> There is indeed good reason to deplore the abandonment of the distinction between primary and secondary distribution. It ... might have led to a rational discussion of price policy and its relation to costs. As it is, the magic word 'uniformity' has been substituted for thought.

Had Hill's original plan proceeded, over 130 years earlier, the literature may not have had to wait for these principles to be refined and established by Faulhaber and his co-workers.[4]

[2] While these were described by Hill as 'places of inferior importance' and 'less penetrable retreats of ignorance' (page 57); this was not intended to be pejorative. Hill believed (page 8) that the acceleration of the 'religious, moral and intellectual progress of the people' was a key reason for reforming the postal system.

[3] Avoidance of cross subsidy also requires that no service is priced at a level above its stand-alone cost.

[4] Faulhaber quotes an economist, E. Porter Alexander writing in 1887, stating the subsidy-free principle in relation to railroad pricing for servicing a small town that is located between two large cities.

Rowland Hill on Statutory Monopoly

Rowland Hill's 1837 Tract provides a fine treatment of the theoretical and empirical considerations required to make a sound judgement on the desirability or otherwise of statutory monopoly. Hill's analysis led him to be an opponent of the statutory monopoly protecting the Post Office from competition. Hill's opposition to legal monopoly stemmed both from his belief that monopoly was bad (on the grounds of its lack of progress and backwardness relative to other institutions that were subject to competition) and that there were advantages to competition.

With respect to the performance of the Post Office as a statutory monopoly, Hill lamented (page 9) that, because:

> … the law constitutes the Post Office a monopoly … [its] conductors are, therefore, uninfluenced by the ordinary motives to enterprise and good management.

Here Hill is placing the emphasis on the lack of incentives to achieve efficient outcomes.

Hill then turns to the empirical evidence. On page 48 he concludes that, based on the assembly and analysis of various facts and figures, the Post Office has:

> generally lagged behind other institutions in the progress of improvement, instead of being … an example to the country of skilful and energetic management.

In the same passage, Hill observes that:

> … however injudiciously the institution may be conducted, however inadequate it may be to the growing wants of the nation, the people must submit to the inconvenience; they cannot set up a Post Office for themselves.

Here Hill draws attention to the implication of the statutory monopoly that others are precluded from setting up a competing postal service that might be more adequate for their wants.

In this regard, Hill obviously believed (page 8) that removal of the monopoly would actually lead to entry of capitalists and that their service would be conducted on commercial principles:

> There cannot be a doubt that if the law did not interpose its prohibition, the transmission of letters would be gladly undertaken by capitalists, and conducted on the ordinary commercial principles, with all that economy, attention to the wants of their customers, and skilful adaptation of means to the desired end, which is usually practised by those whose interests are involved in their success.

Hill in his later autobiography (quoted by Coase, 1939, page 430) referred explicitly to the:

> [p]robable rise of wholesome competition wherever the service is performed with less than the greatest efficiency … [and] would compel the department to have due regard to … economic efficiency in all its arrangements.

In spite of this belief in competition, Hill's pragmatic approach was to reform the institution directly, rather than proposing that it be subject to competition. As Coase (1939, page 431) observes:

> … it was fairly evident [to Hill] that an agitation to remove the Post Office monopoly was not likely to get Government support. … Besides, it was Rowland Hill's view that the Post Office was an undertaking which could be well managed by the State and he clearly hoped that many of the disadvantages … would be eliminated by his proposals.

Coase (1961) later revisited this theme in his third paper about the postal industry. This paper describes and discusses a strident debate in 1891 over the postal monopoly in the 'Letters to the Editor' of *The Times* between the famous Cambridge Professor of Economics, Alfred Marshall (opposing the monopoly) and an anonymous correspondent who turned out to be the Post Office Solicitor (supporting the monopoly). In the course of this debate, the Post Office Solicitor claimed that Rowland Hill was a supporter of the monopoly, and asserted that Hill would have disagreed with Marshall. This was a serious error. Coase (pages 64-65) is able to refute this absolutely, announcing emphatically that the Post Office officials 'were wrong' (page 65) and quoting Hill directly in relation to 'the evils attaching to every monopoly' and specifically in relation to the inappropriateness of the Post Office monopoly.

Conclusions

Rowland Hill was both a deductive thinker and skilled empiricist who deserves to be associated with a suite of sound economic principles guiding, in particular, taxation, efficient utility pricing and administration of utilities. Rowland Hill's solution to the Secondary Distribution provided economists with a number of ageless principles including the framework for avoiding cross-subsidy (incremental cost and every branch at least defraying its own expenses). His critique of statutory monopoly was brilliant. He was regarded as a peer by the foremost political economists of his day, and no-less an authority than Ronald Coase honoured Hill by making him the subject of two of his finest published papers, and a significant guest in a third paper which focuses more on Alfred Marshall. Rowland Hill was also skilled in advancing public policy, and left a legacy of tangible reforms to the postal system.

However, the irony is that Rowland Hill is usually remembered for things that he did not actually support and that he regarded as an anathema to the sound practice of utility economics. The most obvious things in this category are uniform geographic pricing and statutory monopoly – these are actually the converse of what Hill believed and advocated.

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Critical Issues in Regulation – From the Journals

Western Australia's Domestic Gas Reservation Policy: The Elemental Economics, Kelly Neill, *Economic Papers*, 36, 2, June 2017, pp. 121-134.

Western Australia's domestic gas reservation policy nominally requires new gas-export projects to supply the equivalent of 15 per cent of their exports to the domestic gas market. This export restriction suppresses the domestic price below the export netback price. The author develops a theoretical model which shows that a reservation policy which is binding always causes deadweight losses (damage to economic efficiency) on both the consumption side and the production side. Using data from the Western Australian natural gas market (set out on pages 129-131), the author, Kelly Neill, then quantifies the deadweight losses.

The author clarifies the two sources of deadweight losses using a diagrammatic apparatus. The first deadweight loss is in terms of foregone exports where gas is diverted to the domestic market that would otherwise have been exported. These diverted units are valued more as exports than as increased domestic consumption, and the difference between these two values is a deadweight loss. The second deadweight loss caused by the domestic gas reservation policy arises from the reduced overall output of gas that is a consequence of the suppressed price. This reduced output is valued at more than its cost of production, and the excess of this lost value over the saved production cost is a deadweight loss to the economy.

Western Australia's domestic gas reservation policy is estimated to cause deadweight losses with a present value of between $6.9 billion and $22.9 billion, depending on export netback prices used in the estimation. (The higher the netback export prices the higher the deadweight losses.)

There are thirty-two items in the reference list with most of these items being publications by government departments and agencies.

The article can be accessed by subscription to *Economic Papers*.

Applying a Third Party Access Model for China's Gas Pipeline Network: An Independent Pipeline Operator and Congestion Rent Transfer, Jing Xu, Michelle Hallack, and Miguel Vazquez, *Journal of Regulatory Economics*, 51, 1, February 2017, pp. 72-97.

This article is about congestion management in liberalised power systems, where generation and transmission services are unbundled, but remain tightly interlinked. Congestion management in the transmission network is crucial for the efficiency of these inter-linkages. Different regulatory designs have been suggested, analysed and followed. One approach is uniform zonal pricing with re-dispatch. Another is nodal pricing.

The previous literature has focused on either the short-term efficiency of congestion management, or on specific issues of timing investments. In contrast, this paper presents a generalised and flexible economic modelling framework based on a decomposed inter-temporal equilibrium model including generation, transmission, and their inter-linkages.

The model covers short-run operation and long-run investments, and hence, allows the authors to analyse short-term and long-term efficiency of different congestion-management designs. These designs vary with respect to: the definition of market areas; the regulation and organisation of transmission system operators (TSOs); the way of managing congestion besides grid expansion; and the type of cross-border capacity allocation. The authors identify and isolate implicit frictions and sources of inefficiencies in the different regulatory designs, and provide a comparative analysis including benchmarking against a first-best welfare-optimal result.

To demonstrate the applicability of their framework, the authors calibrate and numerically solve the model for a detailed representation of the Central Western European (CWE) region, consisting of 70 nodes and 174 power lines. By analysing six different congestion-management designs until 2030, the authors' model shows that, compared with the first-best benchmark (that is, nodal pricing), inefficiencies of up to 4.6 per cent arise. These inefficiencies are mainly driven by the approach of determining cross-border capacities, and by the coordination of transmission system operators' activities.

There are 43 items in the reference list. Year of publication ranges from 1962 to 2016, with about one-half of the items being published since 2010, and another cluster around 2005 and 2006. Journals that are referenced most frequently are: *The Energy Journal*; *Energy Economics*; and *Journal of Regulatory Economics*. There are also references to publications in operations research; linear programming and nonlinear programming.

This article can be accessed by subscription to the *Journal of Regulatory Economics*.

Specifying an Efficient Renewable Energy Feed-in Tariff, Niall Farrell, Mel Devine, William Lee, James Gleeson and Seán Lyons, *Energy Journal*, 38, 2, 2017, pp. 53-75.

This article is about Feed-in Tariff (FiT) structures. According to the authors, FiTs are the preferred policy mechanism to support renewable energy deployment. Commonly-employed structures result in either investors or policymakers incurring all market-price risk. This paper derives efficient pricing formulae for FiT designs that divides market-price risk amongst investors and policymakers. With increasing deployment and renewable energy policy costs, a means to apportion this risk has become of greater importance.

Option pricing theory is used to calculate efficient FiT prices and expected policy cost when investors are exposed to elements of market-price risk. Expected remuneration and policy cost is equal for all FiTs, while policymaker and investor exposure to uncertain market prices differs. Partial derivatives characterise sensitivity to unexpected deviations in market conditions. This sensitivity differs by FiT type.

The magnitudes of these effects are quantified using numerical examples for a stylised Irish case study. Based on these relationships, the authors discuss the conditions under which each policy choice may be preferred. Alongside providing tools for policy, the findings of this paper provide a modelling platform that may aid future academic analyses of FiT policy. Assumptions of investor risk-neutrality, annual volume weighted-average prices and single-cost scenarios were required to facilitate a tractable modelling framework.

While possible directions for future work may compare findings when these assumptions are relaxed, the authors present this paper as a first contribution towards the explicit incorporation of market-price exposure in efficient feed-in tariff specification.

In a global energy market characterised by increasing proliferation of low-cost gas, wholesale energy prices are becoming increasingly uncertain. It is in this context that tools to share this risk efficiently are of increasing importance.

There are sixty-one references listed at the end of the article. The earliest citation is to a 1973 article; and the most recent article cited was published in 2015. Approximately two-thirds of the references have a year of publication between 2007 and 2015.

The article can be accessed by subscription to the *Energy Journal*.

Regulatory Reforms in Small Energy Systems: Experience from Australia's Northern Territory Electricity Market, Rabindra Nepal and Flavio Menezes, *Economic Papers*, 36, 3, September 2017, pp. 300-316.

The authors of this paper observe that global experience with regulatory reforms that promote competition in small and isolated energy markets is limited. This paper aims to contribute to this knowledge by analysing the reform experience and policy options in Australia's Northern Territory electricity market. More private participation in electricity generation and retail in the short-term, and intra-regional market integration in the medium term, may be appropriate policy options as the demand for electricity grows. In the authors' view, reforms in smaller electricity markets such as the Northern Territory should be geared towards meeting environmental and decarbonisation objectives from the early stages.

The authors attempt to identify some of the pitfalls in applying the same logic and rationale to small systems as was applied to justify reform in larger systems. This results in a number of policy lessons:

First, it is not clear that structural reforms in the form of accounting and legal separation of a vertically integrated utility automatically lead to lower electricity prices.

Second, competitive wholesale markets in themselves may not lead to lower residential electricity prices in the absence of effective economic regulation of networks.

Third, competitive reforms need sufficiently large market bases to maximise the benefits from economies of scale and scope that can then flow through to lower electricity prices in the presence of appropriate market design and effective regulation. Differences in wholesale prices between markets provide a clear signal on whether the efficiency gains from interconnecting these markets can be obtained. This implies that efficient decision making on whether to invest in new interconnection capacity is to be guided by understanding the underlying causes behind the wholesale price differences.

Fourth, reforms need to reflect and account for the local contexts. There is international experience that a 'one-size-fits-all' approach to electricity restructuring does not work well.

Fifth, market-based reforms are not future-proof in terms of accommodating and encouraging the development of renewable energy in the transition towards economic decarbonisation. In the case of the Northern Territory, market expansion through interregional connectors is not economically feasible.

There are 57 items in the reference list with year of publication ranging from 1992 to 2016.

The article can be accessed by subscription to *Economic Papers*.

Taking Account of Service Externalities when Spectrum is Allocated and Assigned, Martin Cave and Neil Pratt, *Telecommunications Policy*, October 2016, pp. 971-981.

This article is about the efficient allocation of spectrum where there are positive externalities in spectrum-using services. Providers of these services are unable to capture these external effects because there is no market for them. Spectrum allocation by auction does not take these external values into account because the successful bidder is unable to monetise the value of the externality. In this paper Martin Cave and Neil Pratt contend that the additional external value of services such as broadcasting and mobile telecommunications may be significant. They argue that it is ‘necessary to give thought about how to prevent or correct misallocations arising from failure adequately to incorporate them’ (p. 971). Their consideration culminates in four points about progressing the inclusion of externalities. These four points are set out on page 980.

The article has the following headings: Introduction; The Spectrum Management Problem – With Externalities; The Basic Economics of Incorporating Externalities; Discussion of the Occurrence of the Two Cases (Case 1: Constant Output; Case 2: Variable Output; Conclusion); Measurement Issues; and Making Progress with Incorporating Externalities.

If (Case 1) the spectrum assignment in question has no impact on the output of the services competing for it, the value generated is unchanged, and the problem of spectrum allocation reduces to the minimisation of the aggregate cost of non-spectrum inputs for the relevant services.

In the more common case of variable outputs (Case 2), some means of valuing external effects is needed. Measurement issues are discussed in section 5 of the article and include: consideration of ‘stated preference’ (including ‘contingent valuation’ and ‘choice modelling’); ‘social wellbeing valuation’; and use of ‘international cross-sectional studies’. Estimation ‘faces considerable obstacles’ and it ‘remains to be seen how these might be overcome’ (p. 980).

If external values are known, the auction can be modified by the use of so-called ‘bidding credits’. This is briefly considered under item 4 in the concluding section of the paper.

There are eighteen references in the reading list, mainly to books and government reports. Three journal articles are cited.

The article can be accessed by subscription to *Telecommunications Policy*.

Price Competition and Reputation in Markets for Experience Goods: An Experimental Study, Steffen Huck, Gabriele K Lünser and Jean-Robert Tyran, *Rand Journal of Economics*, 1, 47, January 2016, pp. 99-117.

This paper uses experimental methods to study the effects of price competition in markets for experience goods. These markets are where sellers can build up reputations for quality. The authors compare price competition to monopolistic markets and markets where prices are exogenously fixed. Key concerns of the paper are the impact of both quality regulation and price regulation on market outcomes. There is a ‘little bit of theory’ and a substantial amount of empirical analysis.

Unlike other goods, a factor in the market for experience goods is trust – buyers will choose to purchase an experience good if they trust sellers to provide high quality, and will abstain if they do not. Therefore, trust increases the demand for experience goods, meaning that a lack of trust can impede mutually-advantageous transactions and lead to less economic efficiency.

The authors study flexible and fixed prices in two types of markets – monopolies and four-firm oligopolies. In each case, buyers can observe: previous histories of sellers; a proxy for their reputations; and also the exogenously-set price. It is found that, with flexible prices, low prices and high quality are observed in the oligopolistic market, while high prices with low quality are observed in the monopolistic market.

When a regulated intermediate price is set roughly halfway between the observed oligopoly and monopoly prices, volume increases in the monopolistic market. This increases efficiency by around 50 per cent. However, the same effect also occurs in the oligopolistic market. Surprisingly, demand does not fall in reaction to the price increase, with quality rising even further, meaning that the regulated oligopoly is the most efficient market.

Under unregulated Bertrand competition, consumers ignore reputations and focus on price. Therefore, prices fall to a very low level. Since prices are low, the risk of consumers buying a ‘lemon’ is also relatively low. However, if a regulated price is exogenously set, then buyers are forced to pay more attention to reputations, with that being the only attribute differing between sellers. The risk of consumers buying a 'lemon' is now also higher due to the increased prices. This means that there will be more of a concentration on quality.

In justifying how their findings differ from the standard textbook intuition about price and demand, the authors turn to informational deficiencies and moral hazards. While various forms of regulation – such as standardisation, certification or even 'watchdogs' – are often used on markets for experience goods, it is shown that price regulation is less costly to implement and enforce, and can also be effective.

The reference list contains thirty-two items, with articles cited including from the *American Economic Review*, *Journal of Economic Behaviour and Organisation*, *Economica*, *Econometrica* and *Theoretical Economics*. Year of publication ranges from 1981 to 2014.

The article can be accessed by subscription to the *Rand Journal of Economics*.

Reduced-Form Versus Structural Econometric Methods in Market Definition: Lessons from Aetna-Humana, Subhu Ramanarayanan and Paul Wong, *Antitrust Health Care Chronicle*, June 2017, pp. 18-24.

In **this article**, the authors examine the issues surrounding the use of structural versus reduced-form methods, particularly when it comes to informing relevant market definition. The analysis is in the context of the merger litigation surrounding the proposed merger of two health insurers (Aetna and Humana), and therefore known as *Aetna-Humana*. The authors believe that both the structural and reduced-form approaches have their merits and flaws, and if implemented appropriately, each can serve as a valuable and insightful input to the market-definition exercise.

In the authors' view, structural econometric analysis might better lend itself to a literal implementation of the thought-experiment underlying the Hypothetical Monopolist Test specified in the *Horizontal Merger Guidelines*. However, it also might run the risk of being driven by non-transparent assumptions about consumer demand or firm behaviour that are out of line with market realities. In such instances, reduced-form studies of market outcomes could provide an additional, and possibly complementary, approach toward understanding the nature of competitive interaction, and what that implies for market definition. They argue that this is particularly true in the healthcare setting, where the substantial degree of variation in market conditions, outcomes across time and across the country (driven by differences in regulation, technology, demographics, etc.), and the availability of detailed data make it a suitable environment for such study.

The econometric analysis supporting definition of the relevant product market in Aetna-Humana brought to the fore a debate over what is considered appropriate proof for establishing that a candidate market passes the Hypothetical Monopolist Test. Specifically, the analysis undertaken by both sides in implementation of the Hypothetical Monopolist Test pitted 'structural' econometric methods (relied on by the Department of Justice's expert) against 'reduced-form' econometric methods (relied on by Aetna-Humana's expert). Structural modelling has the following characteristics: outlines a theoretical model of how competition works; uses data to estimate the parameters of the model; and employs these estimates in a simulation to predict a different state of the world. In this particular case, the structural approach involved simulating the actions of the Hypothetical Monopolist to test whether a profit-maximising Hypothetical Monopolist is likely to impose a SSNIP. Reduced-form methods can encompass analysing a 'natural experiment' that has occurred in the past, or examining variation in competitive conditions and outcomes across markets. Based on the patterns in the data and the analysis that is implemented, whether a candidate market passes the Hypothetical Monopolist Test (for example, by analysis of a natural experiment) can either be directly assessed, or direct evidence on market outcomes can be used to make inferences about the scope of the relevant market.

The authors contend that the objective of antitrust practitioners should be to uncover the necessary details by whatever methods they have at their disposal, be they structural or reduced-form. While it seems clear that structural econometric methods are here to stay, particularly when it comes to market definition and evaluating the Hypothetical Monopolist Test, they are not the only way to answer the questions at hand. In the authors' view, there is still an ample future for 'real-world' analyses in healthcare antitrust, and they will most certainly inform market definition in cases to come.

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Regulatory Decisions in Australia and New Zealand

Australia

Australian Competition and Consumer Commission (ACCC)

Gas Inquiry Interim Report September 2017 – Published

On 25 September 2017 the ACCC published its Gas Inquiry Interim Report September 2017.

See 'Notes on interesting Decisions'.

Quarterly Report on the NBN Wholesale Market

On 11 August 2017 the ACCC released its sixth quarterly National Broadband Network **Wholesale Market Indicators Report** for the period ending 30 June 2017. The market indicators report is intended to provide transparency on the level of competition developing over the NBN.

NBN Co's Revised Special Access Undertaking Variation

On 2 August 2017 the ACCC published a consultation paper regarding NBN Co's revised variation to its Special Access Undertaking (SAU). NBN Co withdrew its original SAU variation and submitted a revised SAU variation in June 2017, mainly to incorporate fibre-to-the-node, fibre-to-the-basement and hybrid fibre coaxial technologies into the SAU, reflecting the current NBN model.

Australian Competition Tribunal (ACT)

No Reportable Matters Listed

Australian Energy Market Commission (AEMC)

A More Stable Power System – New Rules

On 20 September 2017 the AEMC released a **package of rules** to make the electricity system stronger and more resilient.

Strategic Priorities for the Energy Sector

On 12 September 2017, the AEMC **published a discussion paper** outlining priority actions for governments and energy market bodies to support the delivery of secure and reliable electricity and gas to households and businesses at the lowest possible cost, while also meeting emissions reduction commitments. The paper was requested by the COAG Energy Council in December 2016, and was recommended by the Finkel Panel review. Submissions are required by 10 October 2017.

Distribution Market Model Final Report

On 22 August 2017 the AEMC **released a final report** outlining a vision for a competitive 'distribution market' which enables consumers to get the most value out of their rooftop solar panels, batteries and other distributed energy resources as we move to a lower emissions future.

Modelling of a Clean Energy Target Mechanism

On 7 August 2017 the AEMC announced it has been asked by the governments of South Australia, Queensland, Victoria and the Australian Capital Territory, to develop design options for a Clean Energy Target. **A final report is due by October 2017.**

Australian Energy Market Operator (AEMO)

Gas Statement of Opportunities

On 25 September 2017, the AEMO released its **Gas Statement of Opportunities** September 2017 Update.

Electricity Statement of Opportunities

On 5 September 2017, the AEMO **released** its *Electricity Statement of Opportunities* for the National Electricity Market.

Australian Energy Regulator (AER)

Murraylink Revenue Proposal – Draft Decision

On 28 September 2017 the AER released its **Draft Decision** on the amount of revenue that Murraylink, the owner and operator of the electricity transmission interconnector between Victoria and South Australia, can collect through network charges for the 2018 to 2023 regulatory period.

Draft Incentive Scheme Released

On 28 August 2017 the AER published a draft incentive scheme to encourage electricity distribution businesses to improve demand management on their networks. **Submissions are sought by 12 October, to finalise these instruments by December 2017.**

National Competition Council (NCC)

Shipping Channel Services at the Port of Newcastle – Application for Declaration

On 16 August 2017 the Federal Court of Australia handed down its judgment to dismiss an application for judicial review of the Federal Treasurer's January 2016 decision against **Glencore Coal's May 2015 application to the NCC**, for declaration of the right to access and use the shipping channels provided by the Port of Newcastle.

Australian Capital Territory

Independent Competition and Regulation Commission (ICRC)

No reportable items

New South Wales

Independent Pricing and Regulatory Tribunal (IPART)

Assessing Electricity Transmission Reliability Compliance – Approach Finalised

On 29 September 2017 the IPART **announced** that it had finalised its approach to assessing TransGrid's compliance with new NSW electricity transmission reliability standards. The approach addresses feedback received from TransGrid and other stakeholders. The IPART's decision will enable TransGrid to incorporate the costs of compliance in its revised revenue proposal to the Australian Energy Regulator that sets network prices.

IPART's WACC Method – Feedback Sought

On 4 July 2017 the IPART announced it was seeking feedback on the standard method it uses to decide the weighted average cost of capital (WACC) across various reviews. The method was last updated in 2013. The new WACC method will take effect in July 2018. Feedback was required by 18 August 2017, and **a draft report will be released in October 2017**.

Northern Territory

Utilities Commission

Port of Darwin – Changes of Tariffs

On 28 August 2017 the Utilities Commission announced it **will be undertaking a review of the access and pricing regime for the Port of Darwin** which will commence later this year.

Power System Review 2015-16 – Released

On 14 July 2017 the Utilities Commission released the 2015-16 Power System Review, with the assistance of the Australian Energy Market Operator in developing forecasts. **A summary of key findings from the review was also published.**

Port of Darwin – Access Policy

On 4 July 2017 the Utilities Commission announced its approval of **the Port of Darwin Access Policy** and the publication of its Final Decision.

Queensland

Queensland Competition Authority (QCA)

No reportable items

South Australia

Essential Services Commission of South Australia (ESCOSA)

Ports Access and Pricing Review – Final

On 11 September 2017 the ESCOSA finalised its review into the South Australian Ports Access and Pricing Regimes for major commercial ports. **Read about the decision to continue the Pricing Regime and the Access Regime to 2022.**

Energy Retail Offers Comparison Report

On 31 August 2017 the ESCOSA released its first monitoring report on South Australian retailers' offers to solar customers. **Read about the report.**

Tasmania

Office of the Tasmanian Economic Regulator (OTTER)

No reportable items

Victoria

Essential Services Commission (ESC)

Port of Melbourne – Tariff Compliance Statement 2017-18

On 5 September 2017, the ESC published the Port of Melbourne's **Tariff Compliance Statement 2017-18**. The ESC will publish commentary on the statement by November 2017.

Western Australia

Economic Regulation Authority (ERA)

Goldfields Gas Pipeline – Quarterly Reference Tariff Variation

On 20 September 2017 the ERA announced that it had **approved** the quarterly reference tariff variation for the Goldfields Gas Pipeline.

Efficient Costs and Tariffs of the Water Corporation, Aqwest and Busselton Water (2016) – Draft Report

On 21 August 2017 the ERA released its draft report with recommendations and findings. **Read the report.** Submissions on the draft report were **published** on 22 September 2017.

New Zealand

New Zealand Commerce Commission (CCNZ)

Fonterra's 2016-17 Base Milk Price Calculation – Final Report

On 15 September 2017 **the CCNZ released its final report** on Fonterra's base milk price calculation for the 2016-17 dairy season. The CCNZ said it was unclear whether the asset beta estimate meets the contestability test under the Dairy Industry Reconstruction Act.

PowerCo Proposal – Issues Paper

On 18 August 2017 **the CCNZ released its Issues Paper** for electricity distributor Powerco Limited's proposal to increase its prices and change its quality standards to spend $1.32 billion on operating and maintaining its electricity-lines network. CCNZ's draft decision will be released in November and final decision by the end of March 2018.

Notes on Interesting Decisions

The ACCC's First Interim Report on the Supply of, and Demand for, Gas

The Australian Government has released the ACCC's first interim report into the supply of, and demand for, wholesale gas in Australia. The ACCC *Gas Inquiry 2017-20 Interim Report* focuses on likely supply and demand conditions for 2018. Estimates of gas supply have been compared to estimates of demand in the east coast gas market for 2018, based on estimates of exports obtained from the liquefied natural gas (LNG) producers and the Australian Energy Market Operator's (AEMO) projections of domestic demand.

The interim report projects a supply shortfall in the east coast gas market of up to 55 petajoules (PJ) in 2018, which could be as high as 108 PJ if domestic demand is higher than expected. According to the report, the significant shortfall is reflected in prices being offered to commercial and industrial customers for 2018 supply which are multiples of historical price levels of $3-4/GJ.

The effect of higher gas prices is felt right across the economy, from households to big business. Gas and gas-powered generators are also an important part of electricity generation, so higher gas prices feed in to higher electricity prices.

Over a third of the commercial and industrial (C&I) users the ACCC interviewed are considering either reducing production or closure due to high gas prices. For many of these users, gas is a feedstock to production or an essentially irreplaceable source of energy, and with the products they make often supplied on international markets higher gas costs cannot be passed on.

The ACCC reported last year, in its East Coast Gas Inquiry, that the Queensland LNG projects resulted in a significant disruption to the market and the supply-demand balance. In 2018, the LNG projects will together produce over 70 per cent of the east coast's gas and account for two-thirds of the east coast's gas demand. It is argued in the report that the expected shortfall could be reduced if the expected sales on international LNG spot markets were instead redirected to the domestic market.

The ACCC has determined appropriate benchmark prices against which to assess current domestic prices and prices being offered to C&I users. These benchmark prices, based on international LNG spot prices, are $5.87/GJ in Queensland and up to $7.77/GJ in the rest of the east coast. This latter price takes into account the cost of transporting gas from Queensland to users in the southern states, as some domestic gas buyers in the southern states now have to rely on contracting with the Queensland LNG producers to meet their needs.

Domestic users in the south are facing very high gas prices, largely as a result of the expected supply shortfall in the south and lack of competition between the southern gas suppliers. Prices in the south could be significantly reduced if additional sources of supply are developed in the south to increase the level of supply and diversity of suppliers.

The ACCC's **Media Release** observed domestic prices on the east coast well in excess of the appropriate benchmark levels. Many C&I users needing to recontract for supply in 2018 and beyond are holding out in the hope of improved conditions, resulting in pent-up demand.

The ACCC observed a 'stark contrast' between the situation on the east coast as compared with the situation in Western Australia, which is not connected to the east coast gas market. The ACCC expected that Western Australia would be well supplied in the short- to medium-term. For C&I users in the west, there are five suppliers competing for their business and prices are low, in the region of $6/GJ. On the east coast, particularly the southern states, users generally have only one supplier, and price offers in 2017 have been in the range of $10-16/GJ.

The Australian Government has recently implemented the Australian Domestic Gas Security Mechanism (ADGSM), which allows for the restriction of LNG exports in an expected shortfall year, with the aim of directing those supplies to meet domestic demand.

According to the ACCC, export controls may go some way to addressing the shortage in the short term. However, it believes that further steps are needed to address the underlying problems of lack of gas supply and lack of diversity of suppliers in the east coast gas market. It believes that supply-side solutions are needed to bring more supply and suppliers into the domestic market, particularly in the southern states. Blanket moratoria and other restrictions on developing new supply should be replaced by case-by-case assessments to allow for new sources of supply to respond to high domestic prices.

A copy of the report is available **here**.

Regulatory News

ACCC and AER Melbourne Office Relocation

The Melbourne office of the ACCC and the AER moves from 360 Elizabeth Street (Melbourne Central) to 2 Lonsdale St (Casselden), effective 9 October 2017.

Network is a quarterly publication of the Australian Competition and Consumer Commission for the Utility Regulators Forum. For editorial enquiries please contact Rob Albon (Robert.Albon@accc.gov.au) and for mailing list enquiries please contact Genevieve Pound (Genevieve.Pound@accc.gov.au).