

# Submission to the ACCC on “Telstra – Structural Separation Undertaking.”

*This submission has been prepared to respond to issues raised in a submission by Professors Gans and Hausman. It has not been commissioned by anyone.* <sup>1</sup>

## Introduction

This (late) submission to the ACCC on “Telstra – Structural Separation Undertaking and Draft Migration Plan” is not a submission aimed at addressing the discussion paper, but is prepared as a rebuttal submission to the submission by Professors Gans and Hausman.

DigEcon Research has not been engaged to prepare this submission, and would not otherwise have submitted as it is expected that the ACCC will see sense and accept the Undertaking and Plan despite the posturing being engaged in by sections of the industry.

However, being interviewed on Sydney radio by Alan Jones, Professor Gans stated that no submission to the ACCC had said “Gans and Hausman are idiots.” This submission is prepared with the express purpose of rectifying that oversight.

However, this report does not actually assert that Gans and Hausman are idiots, merely that they are wrong. It is assumed that Professor Gans designation that to disagree with him is to call him an idiot is merely rhetorical flourish.

In doing so the author notes a certain irony. The last time he wanted to make such a statement about Professor Hausman he engaged Professor Gans to do so.<sup>2</sup> This is mentioned merely to show that matters of economics are, indeed, things on which even great minds can differ. (This point is expanded on in the Appendix).

There are two simple claims made in the Professors’ submission that will be addressed. The core claim of the Professors is that the agreements reached with respect to HFC networks and the marketing of 4G services are inherently anti-competitive. In passing they claim that the cross subsidy approach inherent in uniform national pricing is an “inefficient financing of government objectives”.

The paper proceeds by way of a preamble of some economic concepts that are inherent in the discussion. It concludes with the application of those concepts to the matter in question.

## Preamble – Relevant economic concepts

The discussion of the policy implications of the NBN policy in general, and the NBN-Telstra agreements in particular, rests on a number of economic concepts that are usually taken as given. However, these concepts are at the core of the reason why opinions can differ on the economic regulation of broadband.

## Competition and marginal cost prices.

The starting point of the Professors’ submission is an assumption that competition is good. This assumption is based on the conclusions of economic science that competition produces lower prices and greater innovation than monopoly.

The underpinning theory of the two propositions is potentially in conflict, since the model that results in prices being set equal to marginal costs in a competitive market is based on a static analysis, whereas the role of competition in delivering innovation is a dynamic one. Keen and Standish modelled monopoly or oligopoly pricing as a dynamic process and concluded;

*Contrary to the beliefs of the vast majority of economists, equating marginal revenue and marginal cost is not profit-maximizing behavior, the number of firms in an industry has no discernible impact on the quantity produced, the "deadweight loss of welfare" exists regardless of how many firms there are in the industry<sup>3</sup>*

Empirically, the data for prices of Australian telecommunications show a downward trend with no discontinuity for the introduction of competition and an econometric model showed the price declines could be better explained as the consequence of an experience effect than the declining market concentration.<sup>4</sup>

There is evidence on the claim for innovation. The entire field of data communication from the mid 1970s was imposed on telecommunications carriers from outside and was a source for the regulatory reform of the following two decades. In Australia both ADSL2+ and 3G mobile services were introduced by competitors and not the incumbent. Notwithstanding this evidence, the doyen of the innovation economists Joseph Schumpeter argued that innovation came from large firms able to invest in research and development.<sup>5</sup>

However, if we ignore these reasonable criticisms of the claim that prices under monopoly or concentrated markets are necessarily higher than in competition, there is still more to be explained.

In the simple model of economists all units of a good cost the same, or, if they vary they vary because of the number of units produced. But each unit is substitutable for every other unit. Real production activities are never like this, there are a range of costs for what otherwise look like the same product.

In the telecommunications case the actual cost for delivering every separate household connection varies, because some premises are further away from the exchange than others, and some require digging through rock to lay cable while others are through loamy soil. Even call costs vary because the amount of traffic on every transmission link varies and hence the cost per call varies.

Amidst all this variety firms eventually have to decide on a structure of prices that reflects these costs. They do so by lumping certain events or services into groups and charging prices based on the average of the marginal prices.

How they decide to group them and what prices they choose is more art than science. For example the history of long distance charging bands in Australia contained many revisions to the band structure.<sup>6</sup> The Community Telephone Plan of 1960 adopted eight charge bands for Subscriber Trunk Dialed calls, this was based on a decision to use decadic coding for multi-metering and the use of two codes for free and local calls<sup>7</sup>.

This reflects one of the principles inherent in decisions about how to charge for services. The simplest case is the differential treatment by hotels of a teabag and a miniature of alcohol provided to a guest's room. Both incur a marginal cost to the hotel operator, but the tea-bag is bundled with the room price while the alcohol is not. This reflects a trade-off between the marginal cost and the internal transaction cost of accounting for the charge. It can also reflect demand characteristics, the alcoholic is relatively less insensitive to the price mark-up.

In a recent blog post Gans has suggested that Internet pricing should reflect the actual cost of uploads and downloads on ISPs infrastructure.<sup>8</sup> Such an approach to pricing the NBN wholesale services has been previously proposed by John de Ridder.<sup>9</sup> The challenge in these models is that internet traffic is not event based like telephone calls. It is a non-trivial exercise to meter it, and even less trivial to explain to customers.

Perhaps the most entertaining discussion of the difference between adopting a uniform price and the transaction cost of an actual cost methodology belongs to Frederic Bastiat<sup>10</sup>. He contrasts the British penny post to the French charging mechanism.

People proffering policy advice who call for “competition” need to reflect that real world markets don’t deliver competition the way their theory might suggest.

## Natural monopoly

The second economic concept is that of “natural monopoly”. The clear criterion for the concept of a natural monopoly was established by Baumol as the “strict and global subadditivity of costs.”<sup>11</sup> That is, simply stated, that the entire output of the industry can be produced by one firm at a lower cost than any two or more firms.

This is not simply the same as economies of scale in the case of multiproduct firms.

The concept of natural monopoly has been much contested. For example, DiLorenzo argued that there was no such thing as a “natural” monopoly. He concluded;

*The theory of natural monopoly is an economic fiction. No such thing as a “natural” monopoly has ever existed. The history of the so-called public utility concept is that the late-nineteenth- and early-twentieth-century “utilities” competed vigorously and, like all other industries, they did not like competition. They first secured government-sanctioned monopolies, and then, with the help of a few influential economists, constructed an ex post rationalization for their monopoly power.*

The proposition errs in its understanding of what is “natural” about a natural monopoly. It is not that they will evolve, but that they are a more efficient industry structure than competition. The examples cited of entry into such markets and the lower prices that can result as a consequence often ignore the outcomes for investors.

For example, in Australia we had a duplicated HFC (Pay TV) network constructed. An analysis of prices for services would suggest that this may have been a “good” outcome. However, the reality was that the investors in the Optus HFC network wrote-off the bulk of that investment. A write-off of capital invested is the biggest of all “deadweight losses”.

Whether telecommunications access networks are, or are not, a natural monopoly has been little studied. Quiggin in 1998 argued that the idea had been “prematurely buried”<sup>12</sup>, while Albon et al argued at best that the error cost in presuming the market was not a natural monopoly and finding that it was in reality so was less than the error cost of presuming that it was a natural monopoly and finding that it wasn’t. A particular factor in favour of the latter view was that once the assumption of natural monopoly was made, the error could not be revealed as entry would be prohibited.<sup>13</sup>

More particularly the question of whether certain telecommunications networks meet the test of subadditivity is an empirical one – how do the costs add up. Sharkey outlined the many ways that telecommunications network costs are subadditive in 1982. That work was admittedly self-interested having emanated from Bell Labs.<sup>14</sup>

The actual position of different networks will be discussed later. The point here is that “natural monopoly” describes a state in which the socially beneficial outcome is to exclude entry, that the test for such a position is based on the cost structure and that the cost structure is an empirical issue.

## Network effects

There is a final aspect of telecommunications networks that is of particular relevance in the economic analysis for public policy; this is the question of externality.

The first is the presence of network effects. This captures the idea that the addition of an extra person to the network increases the value of the network to all the other users of the network. But this benefit is not calculated by the person joining the network in their decision to do so – in the language of economists it is an externality.

The value of this externality is not as great as often supposed. Calculating from the number of potential links in a network, Metcalfe's Law posits that the value of the network is proportional to the square on the number of users (more accurately value is proportionate to  $n*(n-1)$  where  $n$  is the number of users).

However, this assumes that every connection has the same value to each and every participant. Odlyzko et al posited that the value of a network grows in proportion to  $n*\log(n)$  to reflect that distribution.<sup>15</sup>

However this direct network effect is not the only effect (outside of the economies of scale in production) of relevance. Shapiro and Varian describe an effect they call 'demand side economies of scale'.<sup>16</sup> This refers to cases where there are two products that are complements in consumption and so the greater the penetration of one, the lower the cost to produce of the other.

As an example, videos on a VHS video cassette tape are a complement to VHS video players. The more VHS video players there are in the market, the lower the price (per unit) will be for the pre-recorded video because more units will be sold across which the fixed costs of production and distribution can occur.

While this is an economy of scale in the second market, its effect in the first market is not on the costs of production but on the value to the user. The utility of my VHS player increases as the number of other people who own VHS players increase, due to the scale economies achieved by producers in the VHS pre-recorded video market and hence increasing the use I can make of my VCR. That is, the demand side economy of scale is mathematically an indirect network effect in the first market.

The existence of economies of scale in production, of (direct) network effects and indirect network effects are significant factors in analysing the broadband access market.

## **The relevance to the NBN**

There are three claims that the Professors make that will be analysed. The first two relate to the claim of the agreements being anti-competitive; the first in relation to HFC and the second in relation to wireless. The third claim is that the cross-subsidy inherent in uniform pricing is inherently inefficient.

### **Anti-competitive effect of HFC agreements**

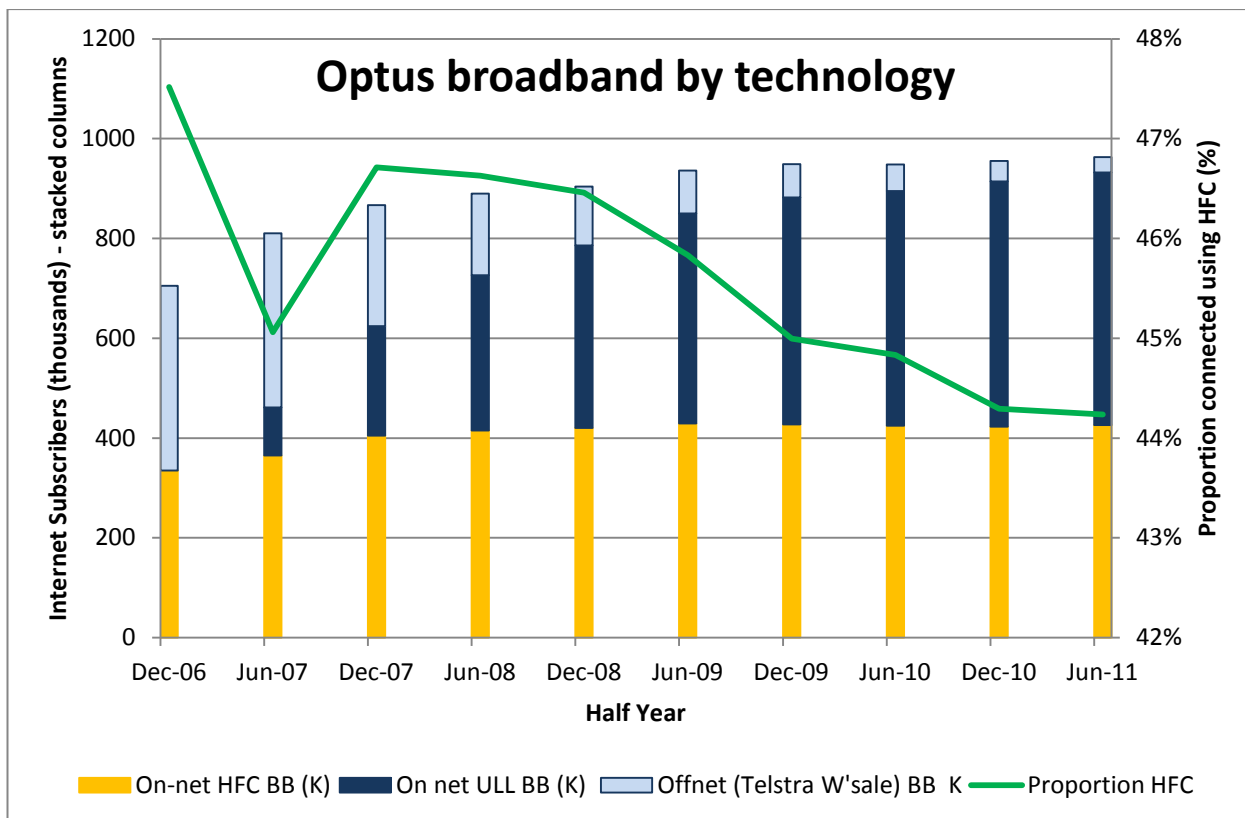
The Professors assert that the agreements reached with both Telstra and Optus to cease marketing their HFC networks for broadband is anti-competitive. That the agreements will result in one network rather than two (or three) being available is undeniable, and hence the assertion that there will be less competition at the network level than there is today is incontestable.

### **Extent of competition post NBN**

The real question is whether this matters. The first consideration is whether the agreements promote retail competition. The second consideration is the third limb of the Long Term Interest of End Users test otherwise used in telecommunications issues; whether the agreements promote the efficient investment in and use of infrastructure.

To deal with the first of these simply, neither Telstra nor Optus has ever made their HFC access networks available for broadband resale. The DOCSIS 3.0 standard that enabled higher broadband speeds (the oft quoted 100Mbps) did introduce the possibility for resale, but neither carrier has implemented these features.

Neither Optus nor Telstra is showing any particular interest in continuing to compete using the HFC networks, and in the absence of the agreements they are still unlikely to compete on the basis of them. The proportion of the Optus broadband customer base connected using their HFC network has steadily declined over the last three years. (Telstra does not break its retail numbers down between HFC and DSL based services). Even with the new standards HFC broadband is not a good substitute for FTTH broadband. The stated peak download of 100 Mbps is shared between all users on a node, not per user. The upload speed is severely limited, so much so that the provider of the cable based broadband for one of the Professors has capped upload at 2 Mbps. The HFC networks utilise external physical connections to join the lead-in cable to the street cable. These corrode and the maintenance cost for the network is relatively high.



**Figure 1: Optus broadband services by technology.**

That is, there is an extremely good case that the extent of infrastructure based competition (from HFC) would still be less than it is today even without the agreements.

To the extent there is effective retail competition it has thus far been delivered by "augmented resale" competition, that is, through the addition of network components (DSLAMs and backhaul) to Telstra's twisted copper pairs. The effectiveness of this competition has been constrained by the vertical integration of Telstra and the fact that economies of scale have resulted in a large number of exchanges having only Telstra DSLAMs (and hence retail customers acquiring the Telstra wholesale service).

### Theory of Inter-modal competition

The Professors asset that;



*competition from independent cable providers has been a critical source of investment in broadband in the US and elsewhere; resulting in improved quality, higher penetration and lower prices for consumers (P1).*

In support of this claim they cite three sources. The chronologically first of these by Denni and Gruber compares broadband penetration rates in various US states.<sup>17</sup> They model a logistic diffusion curve and use an econometric model to estimate the diffusion parameters. From this model they conclude that intra-platform competition (multiple DSL providers) has a positive impact on penetration only initially, but that inter-platform rivalry has a more important role in driving the rate of diffusion. However, the only independent variables they include in their model are variables relating to market concentration, teledensity and state of competition.

An earlier study by Aron and Burnstein did attempt to model penetration using demographic and competition levels as independent variables. That study's conclusion that "after controlling for the demand and cost influences on adoption, intermodal competition drives increased penetration in a state" is unreliable as it is based on a single cross-section and does not account for where in the diffusion cycle each state is.<sup>18</sup>

The study by Wallsten developed an econometric model for broadband penetration across OECD countries. The study concluded that robust unbundling policies had no significant impact on broadband penetration.<sup>19</sup> The study co-mingled multiple years into one dataset and once again made no effort to estimate the diffusion curves. The model also did not actually include inter-modal competition as a variable.

The study by Bouckaert et al reviews many previous studies and then conducts its own analysis of OECD country data and attempts to combine the Wallsten analysis of different forms of regulation with the Denni and Gruber analysis of the extent of inter-platform competition.<sup>20</sup> The study suffers from the weakness of simply including time as a variable in an otherwise linear regression rather than estimating a diffusion curve first. The study does however add appropriate demographic variables. However, on my reading of the data the coefficients for the type of competition are not statistically significant (though I'm happy to be corrected).

In summary, none of the cited studies undertake the combination of estimating a diffusion curve and then estimating the parameters of that curve by use of demographic as well as competition related independent variables. These methodological weaknesses are what lead the various authors into the fallacy that correlation implies causation.

Using the most convincing Denni and Gruber study, we need to consider what the infrastructure used for inter-modal competition is. Cable networks in the US are not new. Most were not constructed as HFC networks but as purely coax networks. To support broadband these networks required additional investment, investment that was not required to support the Pay TV business. In particular the DOCSIS 3.0 standard to supply high speed data services is only required for the data application.

The question is what would motivate an investor to upgrade their cable infrastructure to support broadband, or better broadband? Rational investors will invest in areas where the likely demand is highest. Having so invested they will inevitably gain some market share, and indeed more market share than cable systems that didn't invest in upgrades.

A correlation between higher inter-platform competition and greater broadband penetration therefore tells us nothing about the causal link from the first to the second.

Finally, the studies cited all relate to intermodal competition between DSL and cable modems. They aren't particularly informative about the case where one platform is Fibre to the Premise.

## Natural monopoly

Competition in distribution platforms is not supported in any other utility industry. I am not aware of any arguments for duplicating electricity street distribution, gas distribution, water distribution or sewerage infrastructure.<sup>21</sup>

The case of electricity and gas is interesting because they both provide energy, but the energy they provide is best suited to different purposes (gas for heat, electricity for motors). That could well change if fuel cell type technology develops to the point that household generation of electricity is more efficient than its distribution.

In the case of telecommunications networks the natural monopoly characteristics of the twisted pair network for narrowband distribution have seldom been questioned. Where they were (in the 1980s and 90s) it was because of the technology advances in data transmission and voice encoding and switching that made high capacity links to communications intensive sites or campuses a viable alternative.

The same is largely true of cable networks. In most countries there is a franchise model restricting the market to one operator. DiLorenzo cites Hazlett<sup>22</sup> to claim that in cases where there is duplication of cable prices are lower and consumers benefit.

But lower consumer prices do not always equal efficiency. In a broad sweep at cable industry claims that duplication means higher costs and therefore higher prices, he says;

*As any duplication problem stems from the investment in sunk capital, duplication is only a problem for the operator. Consumers must experience a heightened competition for their business when overbuilding occurs. While overbuilding an existing cable system can lower the profitability of the incumbent operator, it unambiguously improves the position of consumers who face prices determined not by historical costs but by the interplay of supply and demand. (P.69)*

The statement is quite simply astounding. To go to the end, the theory of the benefits of competition is that the interplay of supply and demand does generate a price that is based on the actual cost of supply, not a value lower than it. The sunk cost on which there is now a lower return after overbuild becomes a written-down investment.

The best example is the Australian HFC overbuild that resulted in higher input costs (through the competition for program content) and ultimately the write-off by Optus of most of its capital expenditure.<sup>23</sup> Indeed, the Telstra investment was made with the expectation that it would be value destroying, only less so than the lost value from not competing.<sup>24</sup>

The issue was that twisted pair was a natural monopoly for narrowband, and HFC a natural monopoly for Pay TV. But then to this mix was added the new residential data services made possible through the development of the PC in the early 1980s and the commercialisation of the Internet in the early 1990s.

It should be noted that in the early 90s a great deal of excitement was generated about the prospects for fibre optic networks to address this market. At the time however the terminal equipment for fibre networks was prohibitively expensive.

Cable systems were the first to be able to adapt to this change and introduced cable modems. The development of ADSL by Bell Labs was a piece of goal directed R&D to respond to the business threat posed by cable modems.

Thus, just like the case of gas and electricity reticulation there was an "overlap" area that eroded the natural monopoly characteristics of the previous networks. Under the Baulmol definition of natural monopoly in a multi-product environment neither network was a "natural monopoly" anymore.

But the changing cost structure for fibre network deployment, through the decline in terminal cost through the application of Moore's Law, the scale effects from standardisation, and the experience effects in deployment technology has resulted in FttH architecture being a natural monopoly for the joint product market of telephony, internet access and Pay TV. This is an empirically verifiable statement.

It will be inefficient to promote infrastructure based competition to this network.

### The anti-competitive effect of the wireless marketing restriction

The Professors note the claims that LTE download speeds will increase over time, without pausing to recognise that the download speed achievable with the GPON architecture will also increase, though probably at a greater rate.

The observation that consumers will express a desire to use tablets does not immediately translate to a preference for a wireless connection. Indeed many, if not most, tablet users use their devices more connected to a home or office WiFi network. Optus has recently launched a femto-cell to improve network coverage in your home, to work that device is connected through fixed broadband.

Finally, the Australian Bureau of Statistics in releasing its latest Internet Activity in Australia data headed the release 'Mobile wireless connections more popular than DSL'. They accompany it with a graph of connections by proportion of technology.<sup>25</sup>

This was misleading. Firstly the growth of wireless connections has not been at the expense of fixed connections but in conjunction with, as shown below.

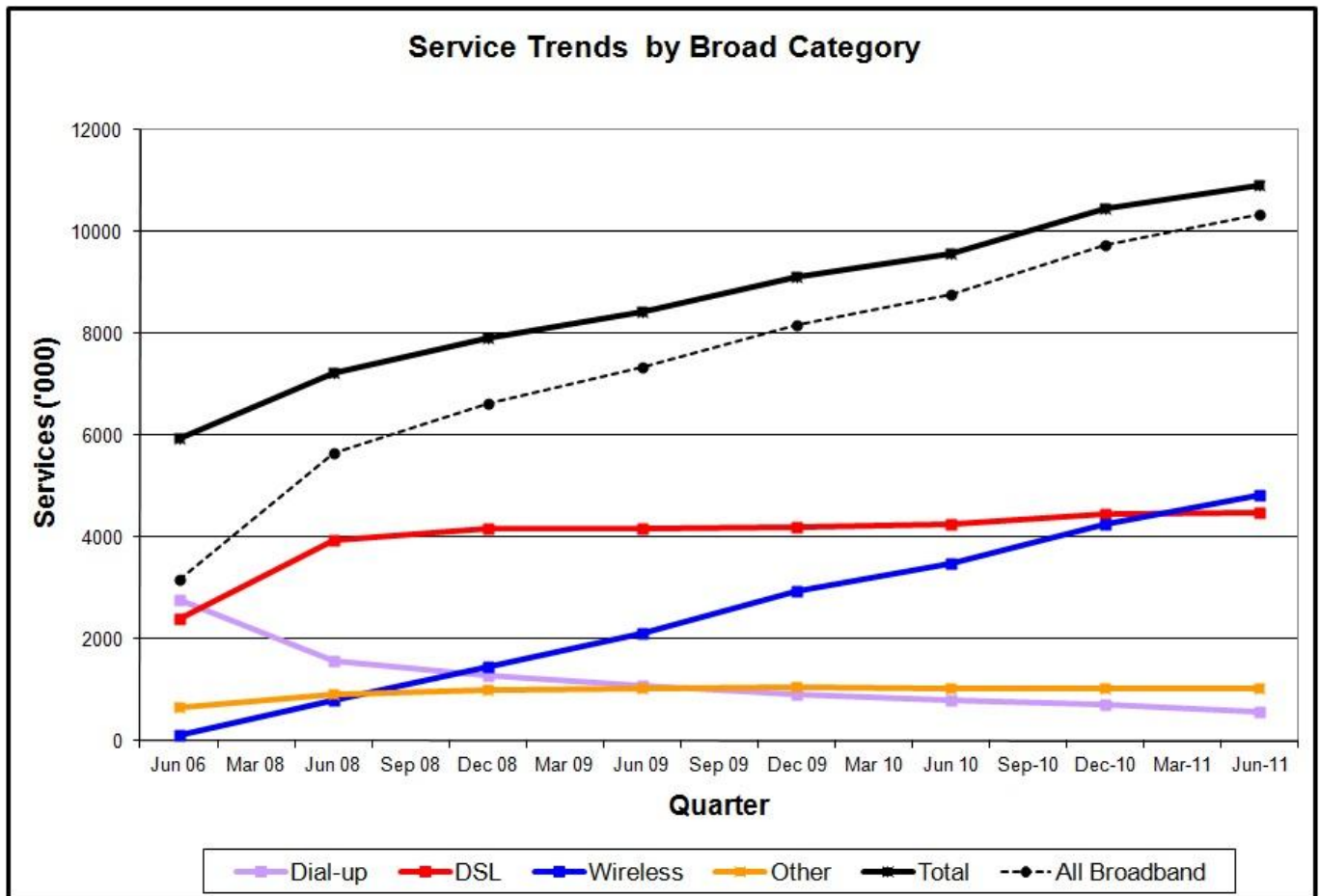
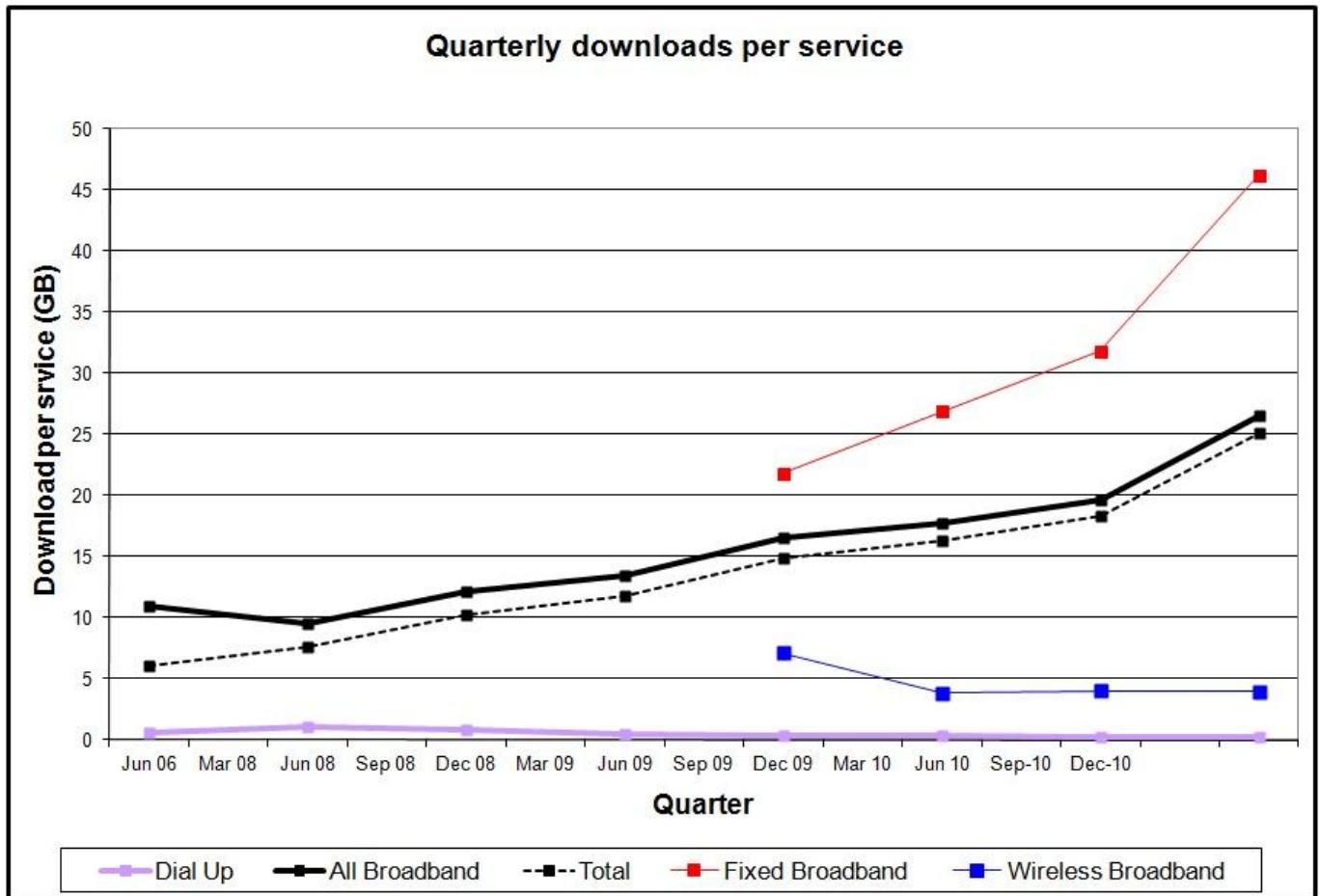


Figure 2: Internet service trends by technology



More specifically the data on downloads does not demonstrate the “popularity” of wireless. Users continue to download increasing amounts of data using fixed line while the data downloaded per user over wireless is relatively static, as shown below.



**Figure 3: Internet downloads per service by access type**

The discussion of whether LTE is a substitute or a complement to FttH is already resolved in Australia, it is a complement. This is the stated position of the three wireless operators.

There is, in fact, a very real prospect that Telstra has conceded nothing by volunteering the undertaking not to promote wireless services as a “substitute for fibre”. LTE cannot deliver the guaranteed bandwidth, nor the price points that fibre can. The ACCC has been particularly concerned about the representations that broadband providers, especially wireless providers, make about the capabilities of their services. A campaign by Telstra that did promote LTE as a “substitute” for fibre would probably be found to be misleading and deceptive conduct.

In the event that promoting wireless as a substitute for fibre is not misleading or deceptive conduct, a restraint placed only on Telstra does not make the market “anti-competitive”. Both Vodafone and Optus will provide LTE wireless services and are not constrained by agreements on how they will be marketed. In addition, vividwireless also has a small 4G WiMax network in place with intention to migrate to TD-LTE.

Finally, the restraint on Telstra is only a restraint on how they promote the service. It does not restrain Telstra from supplying an LTE service to a customer who elects not to connect to the NBN fibre.

## The inefficiency of the cross-subsidy

The Professors make a comment on cross-subsidy by suggesting that justification for protecting the NBN from competition may be to protect it from competition in the denser population areas hence threatening the NBN Co's hope of "subsidising rural roll-outs through urban margins." They continue;

*It is not the role of competition policy to facilitate cross subsidies. Competition policy should promote competition and if governments wish to promote another goal (say, economic provision of broadband services in rural areas) they should finance that policy in another and more transparent manner. Microeconomic reform had moved us away from this type of inefficient financing of government objectives. This proposal would move Australia back. (P.2)*

This claim that uniform pricing for the NBN is inefficient needs to be challenged. Firstly, it is not at all apparent that the purpose of protecting the NBN from competition has anything to do with a cross-subsidy. The case has been made here that it is entirely on the efficiency grounds of natural monopoly.

But the second important issue is that the NBN does include significant direct and indirect network effects. These effects constitute an externality. Economist's first preference is to seek a way to internalise an externality. Uniform pricing is one such way.

The direct network effects of the NBN occur through any person-to-person interaction over the network. There is an erroneous perception prevalent among commentators that the NBN and the Internet are primarily about downloading content from other sites. This is in part true about the actual data structures, but wrong about the communication. Residential e-mails are usually hosted in places other than the local PC; either through an e-mail service offered by the ISP, large scale free e-mail like gmail or Hotmail, or domain hosting. But the content of e-mail is two way communication.

The same is true of the major social networking applications like Facebook, or user generated content applications like YouTube. But even the activity of "downloading" often occurs through the use of peer-to-peer applications like BitTorrent. All these applications have direct network effects.

But the social benefits of the NBN also include the opportunity for education and health services, better interaction with government services, better customer support from corporations. All of these require an investment in the application, that investment is easier to recoup the wider the audience. And hence we see that NBN connections include very large indirect network effects.

However, the indirect network effects have some different characteristics. The new service being offered can only be a replacement for an existing service once there is ubiquity of access. That is, the indirect network effect grows at an increasing rate with penetration.

An example of this from an earlier technology was the move from face-to-face to phone banking. In the early 1990s banks were reluctant to invest heavily in phone banking as they needed to maintain the same high fixed cost branch structures if customers weren't all able to use phone banking. Only with the achievement of ubiquity of the phone and, indeed of tone rather than pulse dialling, could they make the investment in phone banking and substitute it for bank branches.

The adoption of uniform pricing is therefore an efficient internalisation of the direct and indirect network effects.

## Conclusion

The contribution from the Professors has little value for the consideration before the ACCC. They have noted that accepting the undertakings and various agreements is a divergence from “the logic the ACCC has applied in competition matters for almost two decades.”

That divergence is justified by the recognition that facilities based competition in fixed access networks is not an efficient economic model

## APPENDIX – On economics<sup>26</sup>

The comment above that “matters of economics are, indeed, things on which even great minds can differ” is likely to offend some practicing economists and is worthy of explanation.

Economics is a discipline with a somewhat contested domain. Many practitioners seek a position for economics as a “science” modelled on the physical sciences with immutable laws. Others will argue it is at best a social science, while others will identify a distinctly political basis.

Some very major differences are at least apparent in the way economics and physics are studied. All students of physics have some appreciation of how the field developed, whereas the standard economics student hears of Adam Smith and then leaps into the modern “conventional wisdom”.<sup>27</sup>

The second major difference is that students of physics would know what the discipline studies, and that this has been relatively invariant since Aristotle’s “lectures on nature” in the 4<sup>th</sup> century BC.<sup>28</sup>

Students are introduced to economics, using the definition introduced by Robbins in 1932, as the study of “human behaviour as relationship between ends and scarce means which have alternative uses”<sup>29</sup>.

Earlier writers on economics (or political economy as it was originally known) offered their own definitions. Each of Adam Smith, David Ricardo and John Stuart Mill defined the subject of the study differently.

Adam Smith titled his book *The Wealth of Nations*, and as such it is basically an attempt to understand the variety of what we would now call GDP per capita between nations.<sup>30</sup> For David Ricardo the issue was the distribution, as rent, profit and wages, of the “whole produce” to the owners of land, capital and labour.<sup>31</sup>

All the developments of the classical school were brought together by John Stuart Mill in his *The Principles of Political Economy with some of their Applications to Social Philosophy*.<sup>32</sup> For Mill the subject of Political Economy is one of the chief practical interests of mankind, and;

*That subject is Wealth. Writers on Political Economy profess to teach, or to investigate, the nature of Wealth, and the laws of its production and distribution: including, directly or remotely, the operation of all the causes by which the condition of mankind, or of any society of human beings, in respect to this universal object of human desire, is made prosperous or the reverse.*

This then became the final and accepted single pronouncement of the classical school’s definition.

Towards the end of the 19<sup>th</sup> century a new group of economists, primarily Jevons, Menger and Walrus, emerged and established what has since become known as neoclassical economics, with the Kuhnian term “revolution” even being applied either as the “necoclassical revolution” or the “marginalist frevolution”.

Jevons in his preface asserted that “the main problem of the science” is “to determine the wages of labour”.<sup>33</sup> Walras subtitled later editions of his primary work “the theory of social welfare”.<sup>34</sup> Menger claimed that “To aim at the discovery of the fundamentals of our science is to devote one’s abilities to the solution of a problem that is directly related to human welfare”.<sup>35</sup>

Just as Mill had done for the classical school, Alfred Marshall proceeded to provide a definitive text for the neo-classical school. In his *Principles of Economics* Marshall laid the claim that

*Political Economy or Economics is a study of mankind in the ordinary business of life; it examines that part of individual and social action which is most closely connected with the attainment and with the use of the material requisites of wellbeing.*<sup>36</sup>

Taken together these propositions are used to claim that while classical economics was concerned with the practical science of the production and distribution of wealth, neoclassical economics was concerned with the study of the causes of material welfare.<sup>37</sup>

The construct of welfare was then thoroughly analysed by Pigou. He noted

*the range of our inquiry becomes restricted to that part of social welfare that can be brought directly or indirectly into relation with the measuring-rod of money. This part of welfare may be called economic welfare. ...Economic welfare, as loosely defined by this test, is the subject-matter of economic science. The purpose of this volume is to study certain important groups of causes that affect economic welfare in actual modern societies.*<sup>38</sup>

This discussion introduces the normative/positive distinction of which more will be said later. But this, more than Marshall's version, puts the focus of economics on welfare, as specifically measured by money.

It is in response to this conception of economics that Robbins formulated his definition, a definition he felt was superior because

- it does not contain any reference of the term material or welfare.
- it applies as much to the case of an isolated individual as to the complicated net working of society,
- it raises the status of Economics to that of Science, and
- it makes Economics a positive science which deals only with facts.

It can be argued that the last two points are the same.

Is there a useful definition of economics? The answer is possibly no except to define it as something as broadly as "the study of the relationship between human society and the physical resources used to satisfy their desires". From there on the subject is defined by the questions it considers, such as the reason for different wealth levels, and growth rates, between different economies, how resource allocation decisions are made and the consequence of those decisions.

As will be recognised these two questions are generally the distinction between the field of "macro-economics" and "micro-economics", though this distinction was not formally drawn till after the publication of Keynes *General Theory*.

As noted above, economists make a distinction in their field between normative and positive economics. The standard introduction to economics, after introducing the Robbins definition, will move on to emphasise that the discipline is entirely based on what they call "positive" economics.

The distinction was neatly summarised by Pigou as economics "is a positive science of what is and tends to be, not a normative science of what ought to be." The distinction is normally attributed to John Neville Keynes who in 1891 distinguished between a positive science of what is and how it works, a normative science that studies what should be, and the "art of economics" which relates the lessons learned in positive economics to the normative goals.<sup>39</sup>



From here on in the distinction here will use the terms used in philosophy of science, between being a descriptive discipline and a prescriptive one. The reason for rejecting the language used by the economists is because the word "positive" in this context is theory laden around a particular view of science, and of knowing in general. This was the stance of the positivists, or logical positivists, and for them "science" was distinguished because of its way of reasoning from observable facts.

The whole situation is made even harder by the fact that one of the best known papers on methodology in economics was Milton Friedman's "The Methodology of Positive Economics". Yet Friedman elsewhere was a leading proponent of economics as a normative discipline, in particular his linking of the idea of capitalism (a free-market) to that of freedom.<sup>40</sup>

The essay on positive economics is more famous for his claim that the important part of economics was not how well the theory sat as a theory, but merely how successful the theory was in terms of its ability to predict results.

The third of the standard principles introduced to economics students, the use of models, is based on this. Economists, unlike other scientists, go out of their way to promote an instrumental version of their theory. To them economic science is good because it can be used to predict outcomes, not because it describes how things "really" are.

While students of economics are lectured on their science being a descriptive study, we find that public policy is replete with arguments imbued with economic speak. We are asked to embrace a carbon tax, or labour market deregulation because of what "the economists tell us".

The simple reconciliation of this problem, which was named by David Locke as the "is-ought dilemma" is to be found in re-embracing Keynes' three-fold distinction. To argue from a descriptive study (what is) to a proscriptive study (what ought to be) you need to make an ethical assumption (about the goal of action).

So our terminology can be described, and related to that of Keynes, as follows;

<b>Terminology</b>	<b>Keynes' Terminology</b>	<b>Activity</b>
Descriptive theory	Positive science	The science of analysing the reactions of people (as individuals and collectively) to decisions about the utilisation of physical resources
Ethics	Normative or regulative science	The determination of the goals we wish to seek for society (equity, or efficiency, or growth)
Prescriptive theory	The art of economics	The determination of policy stances to achieve the goals given the understanding of how people will make decisions

Table 1: Terminology

The struggle to define economics can then be seen to in part be a result of the confusion between which of the three domains we are discussing. Adam Smith at least was intent on developing a prescriptive theory. By the time of Marshall the adjective "political" was being removed, at the same time as the study was asserting to be descriptive. Hence the distinction between "economic science" and "political economy" can be characterised as the distinction between the descriptive theory and the prescriptive theory.

An alternative use of the epithet “political economy” is the accusation that certain theorists practicing what they assert to be positive economics have included in their system specific but undeclared ethical positions.

Friedman himself thought the distinction between normative and positive because important because disagreements about policies resolved more around what the consequences of decisions would be, rather than about what the ends should be.

*I venture the judgement, however, that currently in the Western world, and especially in the United States, differences about economic policy among disinterested citizens derive predominantly from different predictions about the economic consequences of taking action – differences that in principle can be eliminated by the progress of positive economics – rather than from fundamental differences in basic values, differences about which men can ultimately only fight.*

He provides as an example minimum wage legislation on which he asserts an underlying consensus on providing a living wage and suggests the difference of opinion is because proponents think the minimum wage lifts all wages without counterbalancing increase in unemployment, while opponents focus on the increase in poverty through the unemployment created.

Friedman’s proposition of the commonality of goals is over-stated. In particular, the embrace of “economic efficiency” as a goal is a direct rejection of equity as a goal.

Economists can differ in their consideration of a matter in a number of ways. They can share the exact same view of the economic science and be applying it totally descriptively, but different decisions about which variables to exclude from consideration will result in different outcomes. Economists can differ because they adopt different views of the science, such as the early twentieth century distinction between the original marginal school and the original institutional school. Economists can differ because they are applying different values.

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<sup>1</sup> Report written by David Havyatt 30 September 2011.

<sup>2</sup> Joshua Gans *A Critique of the Statement of Professor Jerry Hausman on Mobile Termination Pricing* May 2005. Available at [http://www.accc.gov.au/content/item.phtml?itemId=684493&nodeId=d7553bb334ac4323367849fc\\_b9c32e85&fn=AAPT+Submission+\(1\)+%E2%80%94+May+2005+.pdf](http://www.accc.gov.au/content/item.phtml?itemId=684493&nodeId=d7553bb334ac4323367849fc_b9c32e85&fn=AAPT+Submission+(1)+%E2%80%94+May+2005+.pdf)

<sup>3</sup> Steve Keen and Russell Standish ‘Profit Maximization, Industry Structure, and Competition: A critique of neoclassical theory’ *Physica A* 370 (2006) 81–85

<sup>4</sup> David Havyatt ‘The structure of the telecommunications industry after thirteen years of competition.’ Paper presented to the 2010 Communications Policy and Research Forum. Available at [http://www.havyatt.com.au/docs/wps/CPRF\\_2010.doc](http://www.havyatt.com.au/docs/wps/CPRF_2010.doc)

<sup>5</sup> Joseph Schumpeter 1942 *Capitalism, Socialism and Democracy* 1942. Note, the observation in the paragraph is not necessarily in conflict. ADSL technology itself was an invention of Bell Labs, while 3G was an innovation of the large equipment firms.

<sup>6</sup> “Over the years, as conversations over longer distances became possible, so additional mileage categories were introduced until the eight rates used in 1902 had grown to 26 in 1951, with the maximum charge applying to calls in excess of 1,300 miles. In 1956, the number was reduced to 22 with the maximum charge applying to calls over 800 miles. In October 1959, the number of rates was again reduced and, at present, there are 11, the maximum charge being in respect of calls beyond 400 miles. This demonstrates the trend to pass the benefit of economies on to the public as advancing technology enables long distances to be spanned more cheaply.” Commonwealth of

Australia *Community Telephone Plan for Australia 1960* at Page 3 of Section III Available at <http://www.digecon.info/docs/0029.pdf>

<sup>7</sup> Commonwealth of Australia *Community Telephone Plan for Australia 1960* at Page 6 of Section III. Available at <http://www.digecon.info/docs/0029.pdf>

<sup>8</sup> Josua Gans 'Network Neutrality and Bank of America's charges' <http://www.digitopoly.org/2011/10/02/network-neutrality-and-bank-of-americas-charges/>

<sup>9</sup> John de Reidder 'Broadband Pricing To Achieve Net Neutrality – Goldilocks Revisited' *Telecommunications Journal of Australia* 59(2) 2009 pp. 31.1 to 31.5. DOI: 10.2104/tja09031

<sup>10</sup> Frederic Bastiat *Economic Sophisms* 1845 In particular Second Series, Chapter Twelve 'Salt, The Postal Service, and the Tariff' available at <http://www.econlib.org/library/Bastiat/basSoph7.html#S.2, Ch.12, Salt, the Postal Service, and the Tariff>

<sup>11</sup> William J. Baumol 'On the Proper Cost Tests for Natural Monopoly in a Multiproduct Industry' *The American Economic Review*, Vol. 67, No. 5 (Dec., 1977), pp. 809-822

<sup>12</sup> John Quiggin 'The Premature Burial of Natural Monopoly: Telecommunications Reform in Australia' *Agenda* 4(4) 1998 PP 427-440

<sup>13</sup> Robert Albon, Alexis Hardin and Philippa Dee *Telecommunications economics and policy issues* Industry Commission Staff Information Paper 1997

<sup>14</sup> William Sharkey *The Theory of Natural Monopoly* Cambridge University Press 1982 – reprinted 2008.

<sup>15</sup> B. Briscoe, A. Odlyzko, and B. Tilly 'Metcalfe's Law is Wrong' *IEEE Spectrum*, July 2006, pp. 26-31

<sup>16</sup> Carl Shapiro and Hal Varian *Information Rules*

<sup>17</sup> Mario Denni and Harald Gruber 'The diffusion of broadband telecommunications: the role of competition' October 2005

<sup>18</sup> Debra J. Aron and David E. Burnstein 'Broadband Adoption in the United States: An Empirical Analysis' March 2003

<sup>19</sup> Scott Wallsten 'Broadband and Unbundling Regulations in OECD Countries' June 2006

<sup>20</sup> Jan Bouckaert, Theon van Dijk and Frank Verboven 'Regulation and broadband penetration – What is required to regain speed in Belgium?' 12 December 2008

<sup>21</sup> DiLorenzo (op cit) did comment on competing electric companies, but this appears to be more about generation and retail. The separated model employed in Australia clearly delineates the natural monopoly element of transmission.

<sup>22</sup> Thomas Hazlett 'Duopolistic Competition in Cable Television: Implications for Public Policy' *Yale Journal on Regulation* 7(1990) Pp 65-119

<sup>23</sup> For the story of Pay TV in Australia see Mark Westfield *The Gatekeepers: The global media battle to control Australia's Pay Tv*. Pluto 2000.

<sup>24</sup> Frank Blount and Bob Joss with David Mair *Managing in Australia* Lansdowne 1999 P.89

<sup>25</sup> Australian Bureau of Statistics Media Release 'Mobile wireless connections more popular than DSL' 28 September 2011 Available at <http://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/8153.0Media%20Release1June%202011?opendocument&tabname=Summary&prodno=8153.0&issue=June%202011&num=&view=>

<sup>26</sup> This appendix is adapted from the introduction of a DigEcon Research paper *Heterodox Economics and Public Policy* forthcoming.

<sup>27</sup> "Conventional wisdom" was a phrase used by Galbraith ( ) to refer to what a Kuhn (1968) would call a paradigm. To avoid the philosophy of science debates that accompany paradigms, Galbraith's term will be used here.

<sup>28</sup> Aristotle's book is generally referred to as *Physics*.

<sup>29</sup> Robbins, Lionel. 1932 *An Essay on the Nature and Significance of Economic Science* McMillan and Co Ltd. London. (2<sup>nd</sup> Ed 1948) also at Robbins 1932 <http://mises.org/books/robbinessay2.pdf>

<sup>30</sup> Smith divided the analysis into five sections, briefly

1. The causes of the improvement in the productive powers of labour, and the order, according to which its produce is naturally distributed.

2. The nature of capital stock, of the manner in which it is gradually accumulated, and of the different quantities of labour which it puts into motion, according to the different ways in which it is employed.
3. The circumstances which seem to have introduced and established the policy of Europe that has been more favourable to arts, manufactures, and commerce, the industry of towns, than to agriculture, the industry of the country.
4. To explain those different theories of political economy; of which some magnify the importance of that industry which is carried on in towns, others of that which is carried on in the country; and the principal effects which they have produced in different ages and nations.
- 5 The revenue of the sovereign, or commonwealth; (that is taxation)..

Smith 1776 <http://marxists.org/reference/archive/smith-adam/works/wealth-of-nations/index.htm>

<sup>31</sup> Ricardo *Principles Of Political Economy And Taxation* 1817

[http://oll.libertyfund.org/?option=com\\_staticxt&staticfile=show.php%3Ftitle=1395&chapter=82859&layout=html&Itemid=27](http://oll.libertyfund.org/?option=com_staticxt&staticfile=show.php%3Ftitle=1395&chapter=82859&layout=html&Itemid=27)

<sup>32</sup> Mill, John Stuart 1848 *The Principles of Political Economy with some of their Applications to Social Philosophy* Routledge and Kegan Paul. London (1965)

[http://oll.libertyfund.org/index.php?option=com\\_staticxt&staticfile=show.php%3Ftitle=102&Itemid=27](http://oll.libertyfund.org/index.php?option=com_staticxt&staticfile=show.php%3Ftitle=102&Itemid=27)

Mill made some immodest claims for his work, saying "It might, perhaps, be sufficient to say, that no existing treatise on Political Economy contains the latest improvements which have been made in the theory of the subject.... To supply, however, these deficiencies in former treatises bearing a similar title, is not the sole, or even the principal object which the author has in view. The design of the book is different from that of any treatise on Political Economy which has been produced in England since the work of Adam Smith. The most characteristic quality of that work, and the one in which it most differs from some others which have equalled and even surpassed it as mere expositions of the general principles of the subject, is that it invariably associates the principles with their applications.... It appears to the present writer, that a work similar in its object and general conception to that of Adam Smith, but adapted to the more extended knowledge and improved ideas of the present age, is the kind of contribution which Political Economy at present requires."

<sup>33</sup> Jevons, W. Stanley 1871 *The Theory of Political Economy* London. McMillan and Co (3<sup>rd</sup> Edition 1888) Jevons 1871 <http://www.econlib.org/library/YPDBooks/Jevons/jvnPE.html>

<sup>34</sup> Walrus, M-E Leon 1874 *Éléments d'économie politique pure* (Elements of Pure Economics)

<sup>35</sup> Menger, Carl 1871 *Principles of Economics* New York University (1976 with online correction 2004) Menger 1871 <http://mises.org/etexts/menger/principles.asp>

<sup>36</sup> Marshall, Alfred 1890 *Principles of Economics* McMillan London (8<sup>th</sup> Ed 1920) Marshall 1890 <http://www.econlib.org/library/Marshall/marP1.html#Bk.I,Ch.I>

<sup>37</sup> This distinction seems to fail however, as Marshall's very next words are "Thus it is on the one side a study of wealth; and on the other, and more important side, a part of the study of man."

<sup>38</sup> Pigou, Arthur 1920 *The Economics of Welfare* McMillan. London (4<sup>th</sup> Ed 1932) Pigou 1920

<http://www.econlib.org/library/NPDBooks/Pigou/pgEWCover.html>

<sup>39</sup> Keynes, John Neville 1891 *The Scope and Methodology of Political Economy* (Batoche Book Kitchener 1999) Keynes 1891 <http://socserv.mcmaster.ca/econ/ugcm/3ll3/keynesjn/Scope.pdf>

<sup>40</sup> Friedman, Milton 1953 'The Methodology of Positive Economics' in *Essays in Positive Economics*. Chicago Press (also available in Daniel M Hausman (Ed) *The Philosophy of Economics: An anthology* Cambridge University Press)

## About DigEcon Research

### Purpose

DigEcon Research is a stand alone research body. Ultimately, its pursuit is policy research, the focus of which is the meaning and significance of the Digital Economy. This policy research encompasses both economic and social research.

### Researching the significance of the Digital Economy

The concept generally referred to as the Digital Economy is frequently discussed but there is little shared meaning in the term. A key definitional issue is whether the Digital Economy is something yet to happen or in which we are now embedded.

DigEcon Research focuses on the analysis of social and economic change rather than an analysis of a notionally static "Digital Economy". Analysis of the change as it occurs should highlight those areas where there is genuine policy choice rather than merely a need to adapt policy to changes that have already occurred.

Before Thomas Kuhn popularised the idea of "paradigms" J.K.Galbraith railed against the "conventional wisdom". There is no denying that what Kuhn called "normal science" or the repeated application of existing theory to new problems results in most practical developments. It is equally true that the application of existing theory to problems they were not designed for results in, at best, vacuous solutions and, at worst, wildly dangerous outcomes.

The Digital Economy challenges the fundamental concepts of neo-classical economics. It also challenges most of the precepts of how societies are organised. In this context policy research needs to focus on what is different, not on what is the same. The Digital Economy is not just a matter of means of production but about the fundamental structures of social organisation.

### Work program

This research is designed both to inform policy makers and to assist those who would seek to influence policy makers or to make business decisions. DigEcon Research however does not provide strategy recommendations nor undertake policy advocacy on behalf of any party.

A key element of the research will relate to the direct regulation of the converging industries of telecommunications, media, consumer electronics and information technology. However, the agenda encompasses the wider economic and social policy issues.

The scope of the research agenda will ultimately depend upon the researchers who wish to participate in what is more an idea than an entity.

In the crowded Australian research field there are a number of "bodies" that share some of the objectives of DigEcon Research. DigEcon Research aspires to contribute to the work of these and any other researchers in the field.