Framework for assessing costs and benefits of improving access to retail data

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Introduction

The Electricity Authority's (the Authority) work programme for 2013/14 includes a project to consider issues with retail data.[1] The primary purpose of this project is to promote competition in the electricity industry to achieve the Authority's aspiration of "widespread confidence in competitiveness of markets". Monitoring is also a statutory function of the Authority and parts of the project will improve the Authority's ability to perform this function.

The retail data project will assess whether the following matters impede competition in the electricity sector, and will consider options for addressing any barriers to competition:

(a) incomplete data available to the Authority and other stakeholders about retail prices and the resulting costs to consumers is inhibiting effective monitoring and analysis of the retail market

(b) incomplete data available to consumers on retail tariff options and consumption data is inhibiting the ability of consumers to make informed decisions about electricity and gas

(c) the complexity and uncertainty that arises from a lack of good quality information is adversely affecting the propensity of consumers to make decisions about electricity (i.e. imposing a high cost of attention)

(d) a lack of clarity around prices paid by consumers is leading to poor consumer decisions and a lack of innovation by retailers and service providers

(e) asymmetry of information between incumbent retailers and competitors may be inhibiting innovation, particularly around consumption profiles and price signals

(f) a perception by consumers and observers that the existing market arrangements, especially as they relate to retail matters, are not delivering outcomes that are for the long-term benefit of consumers.

The Authority's statutory objective is to *promote competition* in, reliable supply by, and the efficient operation of the electricity industry *for the long-term benefit of consumers* (emphasis added). This paper describes the linkages between the objective of promoting competition, the retail data project, and the long-term benefit of consumers. It describes how the retail data project is expected to improve the process of competition and in turn improve the long-term benefits for consumers and how these benefits (and the costs of achieving them) might be quantified.

[1] Electricity Authority, 2013/14 work programme, Table C, project C8. The work programme is available at, http://www.ea.govt.nz/dmsdocument/15241.

The paper begins with a reminder as to what is competition and how that is expected to produce long-term benefits for consumers.

Competition is a process of rivalry

At its core, competition is a process of rivalry between sellers (or between buyers) to win and retain sales (or supplies), analogous to a sporting competition. It implies independence of action and the absence of collusion or coordination, where the conduct of each rival affects and constrains the conduct of others. No player in a competitive market can conduct themselves without regard to the behaviour of other players.

This real world view of competition is not described by the economic textbook theory of perfect competition. The theoretical concept of perfect competition establishes the formal conditions for certain theoretical outcomes associated with allocative efficiency.[2] The theory of perfect competition is an equilibrium condition, in which all firms earn a normal rate of return and resources are efficiently allocated, such that there is no incentive for anything to change and hence the process of competition almost ceases to exist. Firms in a perfectly competitive equilibrium do not alter their prices, do not advertise or differentiate their products or attempt to reduce their costs or innovate.

Real world competition, however, is essentially about conduct, as the parallel concept of sporting rivalry implies. The competitive process is the means by which market conditions are translated into the efficiency outcomes associated with competitive markets. Competition is the process by which firms try to undercut each other's prices, or improve their product range or service delivery relative to rivals, hence driving prices down toward cost and delivering to consumers the products they want by the most efficient and convenient means. It is also the process by which additional resources are directed to the products and areas of greatest consumer demand. In the real world, markets are generally in a state of change rather than equilibrium.

A concept which places more emphasis on the real world process of competition, through which firms constantly vie to meet (and to create) consumers' needs at efficient costs and prices, is the concept of workable competition. The idea of workable, or effective, competition has been adopted as a benchmark for public policies which seek to promote competition. The Authority interprets the term competition in its statutory objective to mean 'workable competition'.[3] Maureen Brunt has described workable competition as:[4]
"… a situation in which there is sufficient rivalry to compel firms to produce with internal efficiency, to price in accordance with costs, to meet consumers' demand for variety, and to strive for product and process improvement".

Under workable competition, some (or all) firms may have a degree of market power, but no firm has a substantial degree of market power. At any particular point in time, prices may deviate from costs and technologies can deviate from the most efficient ones available. However, workable competition is sufficient to drive the market towards efficient prices, outputs and costs. Firms continuously strive for

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2 Essentially, for perfect competition in an economic textbook sense, these conditions are homogeneous products, an infinite number of buyers and sellers, the absence of economies of scale, independence of action, perfect information and free movement of resources.

3 Electricity Authority, Interpretation of Statutory Objective, February 2011, paragraph A.15, available at http://www.ea.govt.nz/about-us/strategic-planning-and-reporting/foundation-documents/

4 Brunt M. (1970), "Legislation in search of an objective", in J.P.Nieuwenuysen (ed.), *Australian Trade Practices: Readings*, Melbourne, Cheshire, p.238

competitive advantage against actual and potential rivals, and the market may always appear in a state of change.

It is also important to distinguish *competition* from *competitors*. Effective competition is entirely consistent with the demise of individual competitors. As competitors vie to offer consumers better products at cheaper prices and to adopt the most cost effective means of delivery, individual firms may adopt different strategies. Some will succeed and others will fail. As the Australian High Court said in Queensland Wire Industries:[5]

> *"Competition by its very nature is deliberate and ruthless. Competitors jockey for sales, the more effective competitors injuring the less effective by taking sales away. Competitors almost always try to 'injure' each other in this way."*

Competition as a driver of long-term consumer benefit

Competition is well understood to be a key factor in driving economic growth, and hence the monetary value of all the finished goods and services produced within an economy. Competition drives growth in a variety of ways.

Firstly, within firms, competition acts as a disciplining device, placing pressure on the managers of firms to become more efficient, hence decreasing the difference between the most efficient behaviour that the firm is capable of and its observed behaviour in practice. This is sometimes called the 'withinfirm' effect.

Secondly, competition ensures that higher productivity firms increase their market share at the expense of the less productive. These low productivity firms may then exit the market, and are replaced by higher productivity firms, with the subsequent positive cross-firm impact on productivity. This is sometimes called the 'across-firm' effect. The relative importance of entry and exit in driving productivity can vary according to the product or service life cycle: entry and exit are more prominent, and have greater productivity-enhancing potential, at early stages of a product's life cycle. Entry and exit tend to have relatively lower effects on productivity in mature industries, and of the two it is exit that seems to have the more significant effect.[6]

Thirdly, and crucially, competition drives firms to innovate. Innovation increases dynamic efficiency through technological improvements to production processes, or the creation of new products and services. Innovation is traditionally seen as an engine for growth and productivity as, in the presence of competition, firms will aim to innovate to gain a cost advantage, to differentiate their products and/or to bring new products to the market place. Competition is, arguably, the strongest incentive for firms to innovate.[7]

In summary, markets are a mechanism for allocating resources. When markets work well, firms are encouraged to compete to provide what consumers want, better and more cost-effectively than their competitors. Effective competition provides significant benefits for consumers through greater choice, lower prices, and better quality goods and services. Competition also provides strong incentives for firms to be more efficient than their rivals, reduce their costs and innovate, thereby helping raise productivity growth across the economy.

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[5] *Queensland Wire Industries Pty Ltd v Broken Hill Proprietary Company Ltd & Anor* (1989) ATPR 40-925.

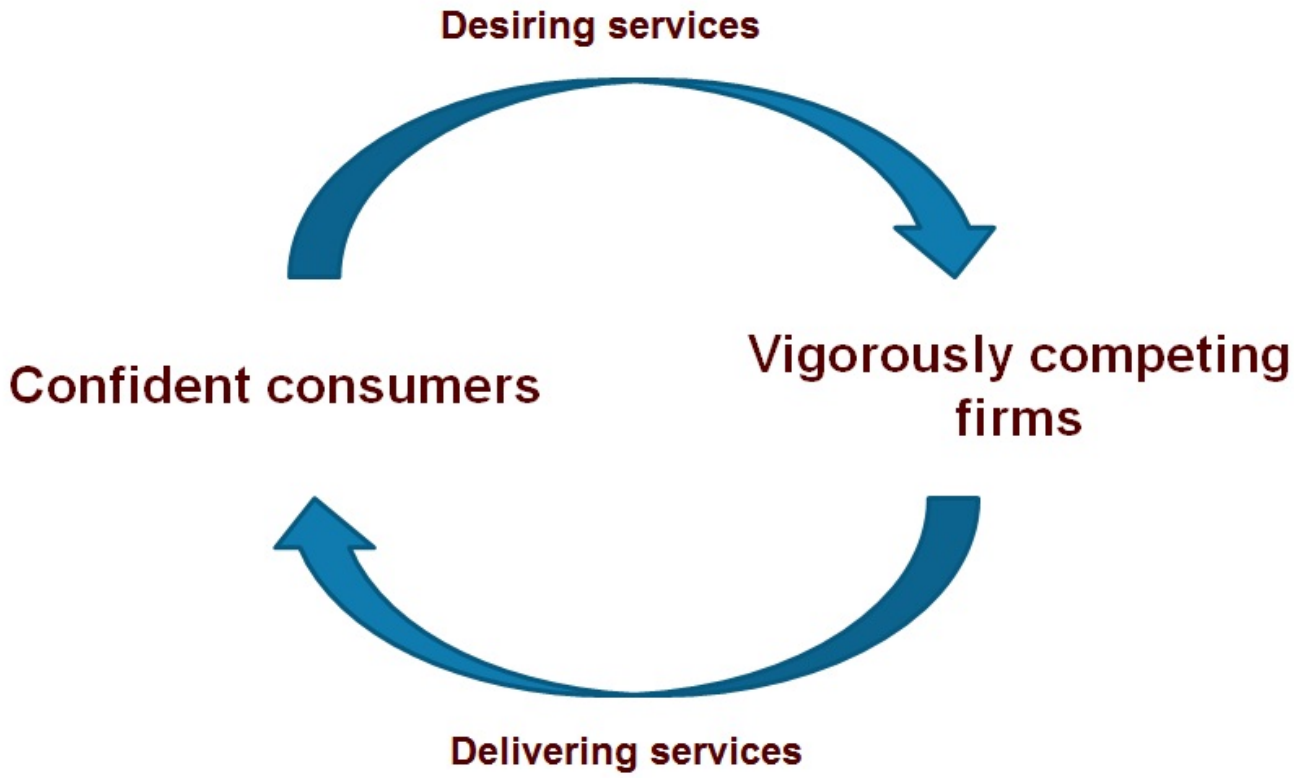
[6] Scarpetta, S., Hemmings, P., Tressel, T., and Woo, J. (2002), 'The role of policy and institutions for productivity and firm dynamics: evidence from micro and industry data', OECD Economics Papers, No. 329.

[7] UK Intellectual Property Office (2011), 'Digital Opportunity: A Review of Intellectual Property and Growth', p. 11

Effective competition involves demand (consumers) and supply (firms)

Markets work well when there are efficient interactions on both the demand (consumer) side and the supply (firm) side. On the demand side, confident consumers activate competition by making well-informed and well-reasoned decisions which reward those firms which best satisfy their needs. On the supply side, vigorous competition provides firms with incentives to deliver what consumers want as efficiently and innovatively as possible. When both sides function well, a virtuous circle is created between consumers and competition. Active and confident consumers and vigorous competition work together in tandem to deliver long-term benefits to consumers.

Figure 1. Virtuous circle of a well-functioning market



Markets can be impeded on either side

Market development initiatives have traditionally been focused on the supply side to reduce costs and increase the opportunities for firms to compete to provide consumers with what they want. However, markets can also be impeded on the demand side in ways that can impede the effectiveness of a market. If consumers are less engaged in the buying process, then firms may find it harder to win market share by providing what consumers most want. This will, in turn, reduce the incentive of firms to work towards that end, competition will be weakened, and less consumer benefit will be delivered by the market. Innovation may be dampened, as firms can only gain from innovation if they can get their products to market and consumers are active and willing to adopt these new, higher value, products.

For consumers to drive competition, they need to:

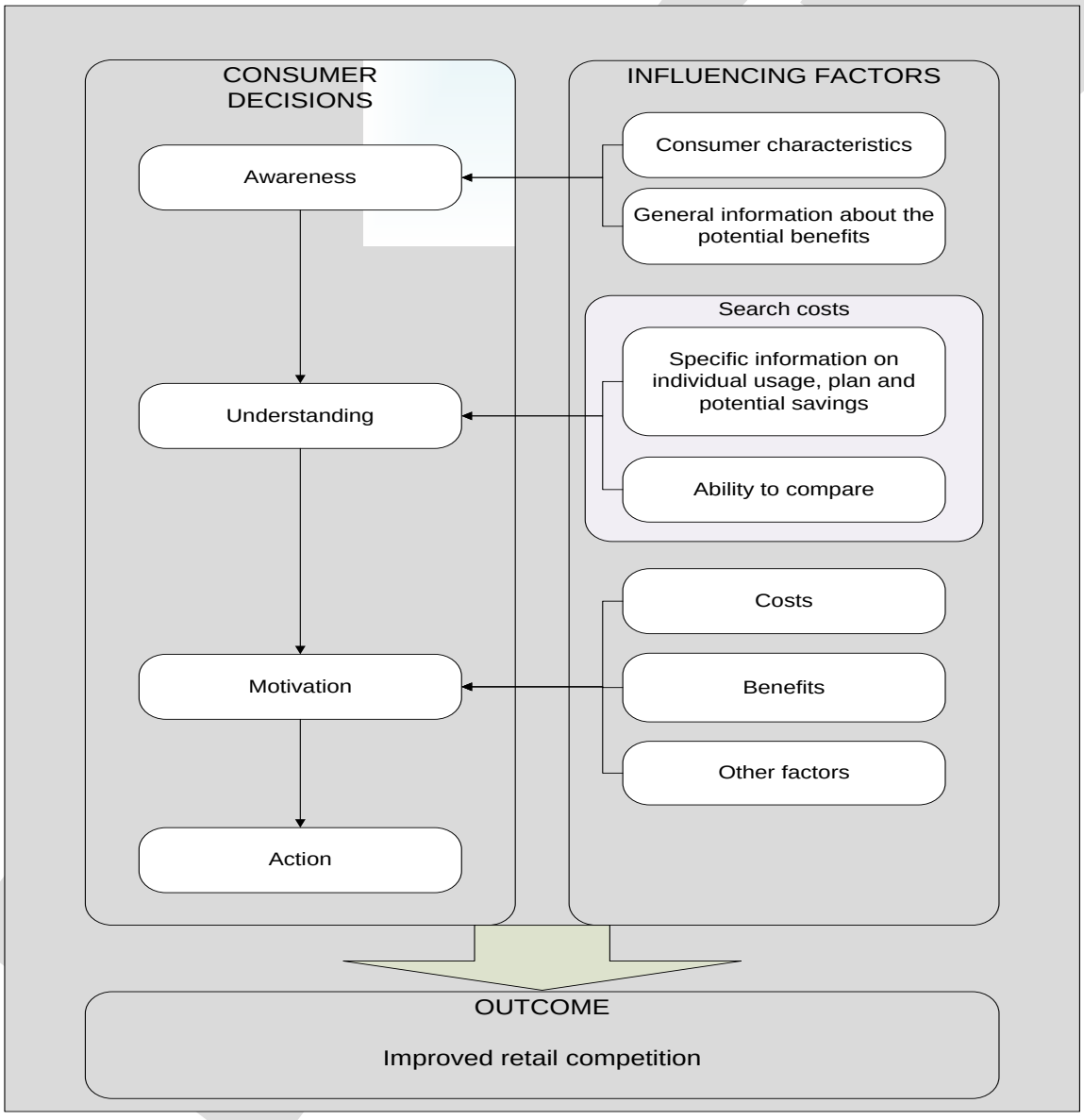
- **access** information about the various offers available in the market
- **assess** these offers in a well-reasoned way, and

- **act** on this information and analysis by purchasing the good or service that offers the best value to them.

When any of these three elements of the consumer decision-making process breaks down, consumers' ability to drive effective competition can be harmed.

Figure 2 shows the key stages of a consumers' decision-making process – awareness, understanding, motivation and action – and the factors that influence a decision at each stage of the process. The process draws on research into methods of marketing and advertising effectiveness.

Figure 2. Consumer decisions and influencing factors



Reduced long-term benefits when demand side less effective

Many aspects of the impact that barriers to consumer participation in the market can have in hindering the competitive process are well articulated in the competition literature. For example, the key role of search

costs in obstructing the ability of consumers to access information, and the impact this has on competition, was shown nearly forty years ago by Diamond in his famous paradox in which many firms may be charging monopoly prices.[8] Diamond found that if there are search costs, consumers may not search the market but simply choose a firm randomly. If consumers choose firms randomly the best (theoretical) response of firms in the market would be to charge a monopoly price (that is, a price higher than the competitive price) to those consumers. Likewise the role of switching costs in creating a barrier for consumers to act, and the potential this has to soften competition, has been well studied by academics and regulators.[9]

More recent developments in 'behavioural economics' extends some of the insights from the earlier economics literature, by examining some of the reasons why consumers may find it hard to assess information and compare across products:

- **Accessing information:** Behavioural biases may exacerbate existing problems for consumers in accessing information. For example consumers tend to look at relative costs rather than absolute search costs, and may search only on the headline price (rather than the total price taking in add-ons), and may tend to forget previous experience.[10]

- **Assessing offers**: Behavioural biases may create or exacerbate difficulties for consumers in assessing the best deal. For example, the ability for a consumer to assess which product would suit them best may be impaired by incorrectly anticipating risk, underestimating or overestimating future use, or overweighting the present.[11] When faced with more information than can be easily analysed, consumers may only look at a sub-set of information and use rules of thumb.[12] Consumers may also be distracted by the ways in which information is framed and presented, including adopting default options, etc.[13]

- **Acting on information:** Behavioural biases may give rise to, or exacerbate, aspects of the market that impede consumers in acting to get the best deals. For example, if consumers have overconfidence in their ability to act in the future, this can create inertia and a tendency for a consumer to fail to act today.[14]

Hence, while barriers to 'access, assess, and act' may exist without behavioural biases, taking account of normal human behavioural biases may provide a greater understanding of why and when those barriers exist, how prevalent they are, and how severe a barrier they can present to active and reasoned consumer choice.

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8 P. Diamond, (1971), A Model of Price Adjustment, J. Econ. Theory, 3(2), 156-58.

9 See the UK Office of Fair Trading, (April 2003), Switching Costs, Economic Discussion Paper 5, for a review of the literature.

10 For example, S. Agarwal, J. C. Driscoll, X. Gabaix and D. Laibson, (2008), Learning in the Credit Card Market, Working paper series, investigate learning in the credit card market. They find that although consumers learn (through negative feedback), this hard-earned knowledge does not fully persist (that is knowledge depreciates).

11 For example, S. DellaVigna and U. Malmendier, (2006), Paying not to go to the gym, Amer. Econ. Rev, 96(3), 694-719,

12 For example, V.G. Morwitz, E.A. Greenleaf and E.J. Johnson, (1998), Divide and prosper: Consumers' reactions to partitioned prices, J. Marketing Res., 35, 453-463, and T. Hossain and J. Morgan, (2005), Plus Shipping and Handling: Revenue (Non) Equivalence in Field Experiment on eBay, Advances in Econ. Analysis & Policy.

13 For example, M. Baye, J. Morgan and P. Scholten, (2004), Price Dispersion in the Small and in the Large: Evidence from an Internet Price Comparison Site, J. Indus. Econ., 52(4), 463-496, and More generally, A. Tversky and D. Kahneman, (1981), The Framing of Decisions and the Psychology of Choice, Sci., 211 (44810), 453- 458,

14 For example, as well as finding consumers are overconfident about gym use DellaVigna and Malmendier, (2006), op cit, supra note 11, suggest that consumers might overestimate their propensity to cancel automatically renewed contracts.

Measuring the gains from consumer driven competition

Static / allocative efficiency

As is clear from the virtuous circle discussed above, static (allocative) efficiency will be affected by the failure of consumers to access, assess, and act on information. Passive consumers do not provide the same type of constraints on firms as active consumers do. In traditional economic terms, this reduction in price sensitivity is similar to a general reduction in both the product's absolute elasticity, and its substitutability (or cross-elasticity) with other products.[15] Such reductions in substitutability can translate into a lessening of the intensity of competition – a softening of competition – and, as a result, higher prices for consumers.[16]

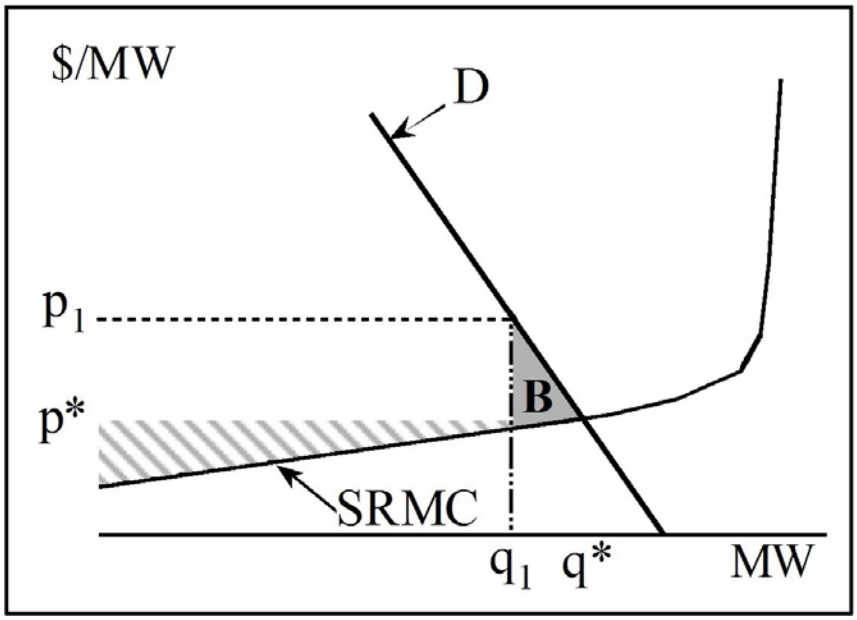
These theoretical findings may offer an explanation for the observed outcomes in the New Zealand market, where over three quarters of consumers do not switch retailers despite an apparent average saving of $175 per annum being available were they to switch.

The potential and plausible allocative efficiency gains can be estimated using the standard economic calculations for estimating deadweight losses (sometimes called the Harberger triangle). Allocative efficiency requires that prices are equal to marginal costs. If the retail price of electricity increases to a level above the marginal cost of delivered electricity, there will be a corresponding reduction in the quantity demanded of electricity relative to the allocatively efficient level (associated with marginal cost pricing). Since the reduced quantity of electricity consumption has a higher value to consumers than the marginal cost of producing it, the quantity reduction represents an allocative efficiency loss, which is often referred to as a “deadweight loss”. Figure 3 illustrates the allocative efficiency loss if prices are above marginal cost.

[15] This point is discussed in respect of switching costs within Klemperer, (1987), supra note 9 but the point is more general.

[16] This result can be derived from either the switching/search literature (see Klemperer, supra note 9, op cit) or the behavioural literature. With regards to the behavioural literature, Ellison and Ellison, (2009), supra note 20, examine price data for internet retailers. They show that some retailers engage in obfuscation to frustrate consumer search, thus resulting in much less price sensitivity on other products. At the extreme, R. Spiegler, (2006), Competition Over Agents with Boundedly Rational Expectations, Theoretical Econ., 1(2), 207-31, showed that under certain circumstances firms' prices may be entirely independent of competition.

Figure 3. Allocative efficiency loss



An allocatively efficient price is p*, where the demand curve (D) crosses the SRMC curve. However, if retail prices are increased to p1 because consumers are impaired from participating in the market, demand would be reduced to q1. This level of usage is inefficient, because the usage that has been discouraged would be worth more to the users than it would cost to produce. The loss in economic welfare is shown by the shaded triangle (B). Economists call this loss to economic welfare, the 'dead-weight loss' (because no one benefits from this loss, it is therefore a dead-weight on the economy).

From basic geometry we know that the area of B is:

The areas of B = 0.5 (p1 – p*) (q* - q1) (1)

Note that

Elasticity of demand = [(q1 – q*)/q*]/[(p1 – p*)/p*]

which implies,

(q* - q1) = [(p1 – p*)/p*] q*/p* (2)

Substituting equation (2) to (1) gives

The areas of B = 0.5 [(p1 – p*)/p*]2 (q*/p*)

This formula implies that the size of the dead weight loss is an increasing function of price elasticity of demand, and the price increase squared. In other words, dead weight loss will be large (or small) if the price increase is large (or small) and if consumers are responsive (or "not particularly responsive") to price changes.

Some approximation of the potential allocative gain from greater consumer participation in the market could be estimated by assuming that the lowest/average retail price in each region is the current workably competitive market price; taking the number of consumers who are on higher retail tariffs, and estimating the allocative efficiency gain were all those consumers to shift to the competitive tariff. This would be an

estimate of an efficiency gain, and would be considerably smaller than the wealth transfer from retailers to consumers.

Estimates of the plausible allocative gain might be estimated by making an assumption as to the proportion of consumers that would switch to the competitive price as a result of the retail data project and other projects to assist consumers to participate in the market. Several ranges could be estimated using proxies such as the effect of what's my number and other examples (probably overseas and from other markets) of initiatives to help consumers to understand the competitive offers available to them.

Productive efficiency

As discussed above, competition also acts as a disciplining device, placing pressure on the managers of firms to become more efficient, resulting in productive efficiency gains. The retail data project, if it succeeds, may however increase the resources (time and effort) devoted by consumers in participating in the market. A reasonable assumption may be that additional resources expended by consumers in participating in the market would offset the productive efficiency savings achieved by firms; that is, the outcome of more competition is a market that is at least as productive efficient as the market with less competition.[17] Countering this is that improvements in the provision of information and ease of decision making may reduce the resources used by consumers in participating.

Dynamic efficiency

One of the key benefits of competition is the role it has in ensuring that those firms that provide the best value continue in the market while those that provide poor value exit. Over time this evolutionary role of competition implies that the average efficiency of the market increases for all consumers. This role is diminished when consumers no longer reward those firms that provide them with what they really want but, instead, reward those that best play on their biases. For example, if consumers perform only limited search, then firms might compete on, and be rewarded for, being the first to attract/purchase consumers, rather than offering the best deal. This potentially implies overuse of resources on customer acquisition, or on advertising or paying for the prominence of their product on an internet search site etc, rather than providing a lower-priced or higher-quality product.

The other key dynamic role that competition plays is as an efficient framework to promote product and process innovation. In general, competition among innovators increases the intensity of innovation and development. However, if consumers are less engaged in the buying process, then firms may find it harder to win market share by providing what consumers most want. This, in turn, may reduce the incentives on firms to invest in the research or innovation needed to generate new services. Removing or reducing these barriers to innovation and enhancing the dynamic role of competition would have a far greater impact on the long-term benefit of consumers than any static effects on competition.[18] An increase in innovation, or a bringing forward of a new product or service, accesses benefits represented by up to the whole area under the demand curve, and not just a reduction in the Harberger triangle/deadweight loss.

Potential dynamic efficiency gains can be illustrated by examples of innovations that have occurred in other markets, especially retail electricity markets. Once any initiatives have been designed, it should be feasible to identify studies which have estimated the benefits to consumers in those markets, and extrapolate those

[17] By definition, if a market becomes more allocatively efficient, the market must have moved closer to the point where, at the margin, the marginal cost of production equalls the marginal willingness of consumers to pay that cost (including transaction costs).

[18] See, for example, J. Hausman and G. Leonard, (2002), The Competitive Effects of a New Product Introduction: A Case Study, J. Indus. Econ., 50(3), 237-63. See also A Petrin, (2002), Quantifying the Benefits of New Products: The Case of the Minivan, J. Pol. Econ., 110, 705.

results to New Zealand, with the appropriate qualifications, to illustrate the potential gains. Alternatively, is may be possible to estimate benefits by scaling benefits arising from innovations to the New Zealand market. The aim would be to show the type of gains that might be possible, which can then be balanced against the resource costs in implementing the retail data and related projects. Cost estimates will be refined as proposals for change are developed.