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A Review of the Concept  
Economics Mobile  
Termination Report  
Telecom New Zealand

**NERA**

Economic Consulting

Public version

## **Project Team**

James Mellsop

Kevin Counsell

Will Taylor

NERA Economic Consulting  
Level 8, PWC Tower  
113-119 The Terrace  
PO Box 699  
Wellington 6140  
Tel: +64 4 819 2550  
Fax: +64 4 819 2552  
[www.nera.com](http://www.nera.com)

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# 1. Introduction and Executive Summary

## 1.1. Introduction

The Commerce Commission has issued its draft report on whether the mobile termination access services (MTAS) should be regulated (the “Draft Report”).<sup>1</sup> In a response to the Draft Report, Concept Economics (“Concept”) has prepared a report for Two Degrees Mobile (“2degrees”) that undertakes a cost benefit analysis (CBA) of mobile termination regulation in the mobile services market (the “Concept Report”).<sup>2</sup>

We have been asked by Telecom to review the Concept Report and assess the rigour of its analysis and conclusions.

## 1.2. Executive Summary

### 1.2.1. Overview

The Concept Report has adopted extreme counterfactuals and factuials, the result of which is an exaggeration of the *benefits* of regulation. This effect is magnified (by about six times) by the inappropriate adoption of a terminal value.

Furthermore, the Concept Report does not analyse the *costs* of regulation.

### 1.2.2. Counterfactuals

The Concept counterfactuals are extreme because they assume that 2degrees will be a marginal, or indeed a failing, player, without the assistance of tighter mobile termination rate (“MTR”) regulation. However, this is presumably not the view of investors in 2degrees, who have apparently invested \$250m to date<sup>3</sup> – it is not credible to suggest that they have done this on a gamble that the Government will change the Telecommunications Act to reduce MTRs.

Furthermore, there are numerous examples of sustained entry and expansion by mobile network operators (“MNOs”) in the face of above cost MTRs and on-net/off-net pricing by incumbents (these examples are documented in Appendix A to our report).

### 1.2.3. Factuials

The Concept Report makes the assumption that mobile prices will fall by 60% over five years in the factual, due to the entry of 2degrees and regulation of MTRs. The implication of Concept’s assumption is that if there were three established MNOs in New Zealand today, mobile prices in New Zealand would be 60% lower than they actually are. However, this

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<sup>1</sup> Commerce Commission (2009), “Draft report on whether the mobile termination access services (incorporating mobile-to-mobile voice termination, fixed-to-mobile voice termination and short-message-service termination) should become a designated or specified service”, 30 June.

<sup>2</sup> Concept Economics (2009), “Assessment of the Consumer Benefits of Mobile Termination Regulation in New Zealand”, Report prepared for Two Degrees Mobile Ltd, 28 July.

<sup>3</sup> Source: National Business Review, 4 August 2009.

assumption fails a basic “sanity check”, as it would imply that New Zealand would have virtually the lowest mobile prices in the world. Given New Zealand’s small population, low income per capita (compared to most OECD countries), low population density and mountainous terrain, it does not seem credible that we would have significantly lower prices across all three OECD user baskets than, for example, the UK.

Furthermore, the literature and benchmarking that Concept relies on for the 60% assumption does not control for possible drivers of price changes other than entry. It is therefore not rigorous.

#### **1.2.4. Costs of Regulation**

The Concept Report ignores the waterbed effect, apparently on the basis that such an effect only exists in perfectly competitive markets. However, this is clearly wrong – the economics literature finds that there would be a waterbed effect even if there was a monopolist MNO.

## **2. Concept’s Factual and Counterfactual**

We have several concerns with the specification of the factual and counterfactual in Concept’s CBA. In particular, Concept has:

- In the counterfactual, downplayed the competitive impact that can be expected of 2degrees; and
- In the factual:
  - Made an aggressive assumption as to the fall in mobile voice price (60%) that does not pass “sanity checks” and lacks rigour;
  - Implicitly assumed a factual pass-through rate that is implausibly large;
  - Accepted the Commission’s factual benchmarks, which we have critiqued in our earlier report; and
  - Referred to 2degrees’ submission that MTRs should be based on a “LRIC” estimation of costs rather than “TSLRIC”, which would result in a radically new approach to access pricing in New Zealand.

We discuss each of these issues in the following sections.

### **2.1. The Impact of 2degrees in the Counterfactual**

Throughout the Concept Report, the competitive impact of 2degrees in the counterfactual is downplayed. Concept establishes two counterfactuals for the absence of regulation: in Concept’s “counterfactual 1”, 2degrees is unable to operate viably in the absence of regulation and exits the market in 2011; in “counterfactual 2”, 2degrees continues to operate in the absence of regulation but “is only able to target a limited proportion of the customer base” (p.18).

Both of these counterfactuals are inconsistent with public statements made by 2degrees, to the effect that it is not relying on regulation in order to enter the market. In May 2009, for example, then-Chief Executive Mike Reynolds is attributed with stating that he “was not relying on any more regulation in order to launch and would “focus on the rules of the game as they exist today””.<sup>4</sup> Indeed, 2degrees arguably committed to entry at least as early as March 2008, when it is reported that the company had started building cell sites (and so had likely sunk some of its entry costs),<sup>5</sup> whereas the Commission’s Draft Report recommending regulation was not issued until June 2009.<sup>6</sup>

Concept also relies on a Slovenian case study to argue that lack of MTR regulation makes entry very difficult.<sup>7</sup> However, there are many examples of entry (and expansion) in the face of above cost MTRs, and on-net/off-net price differentials, that counter the Concept argument. Consider the case of Ireland, a country with a similar population to New Zealand’s.<sup>8</sup> Meteor was the third MNO in the Irish market, entering in 2001. Cost-based regulation of Irish MTRs occurred in 2005.<sup>9</sup> Meteor has been successful in acquiring new subscribers despite on-net/off-net pricing by the incumbents.<sup>10</sup> This pricing is shown in Figure 2.1, which illustrates the difference between the on-net and corresponding off-net price as a percentage of the off-net price.<sup>11</sup> On-net/off-net price differentials were introduced by the incumbents in 1999 and 2000, and have been sustained over the subsequent period of Meteor’s entry and growth. Table 2.1 shows that Meteor’s market share has been increasing even in the presence of the on-net/off-net price differentials and, until regulation in 2005, above cost MTRs. (In 2005, a fourth player, Hutchison 3G, also entered).

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<sup>4</sup> “Wellington, Manukau frustrate 2degrees”, Stuff, 11 May 2009, Available at: <http://www.stuff.co.nz/technology/2400954/Wellington-Manukau-frustrate-2degrees>

<sup>5</sup> “Hard slog for third mobile network builder”, National Business Review, 28 March 2008, Available at: <http://www.nbr.co.nz/article/hard-slog-third-mobile-network-builder>

<sup>6</sup> Even the Commission’s decision to consider an investigation into regulation of the MTAS is subsequent to the reported initial investments made by 2degrees: Commerce Commission Letter to Interested Parties re Mobile to Mobile Termination, 8 May 2008.

<sup>7</sup> Interestingly, Slovenia has a population of only 2m, and so there may be a scale issue for a new entrant.

<sup>8</sup> Although a higher population density.

<sup>9</sup> See Commission for Communications Regulation, (2005), *Decision No. D11/05*, 13 October.

<sup>10</sup> Eircell/Vodafone (entered 1993) and Estat/BT/O2 (entered 1997).

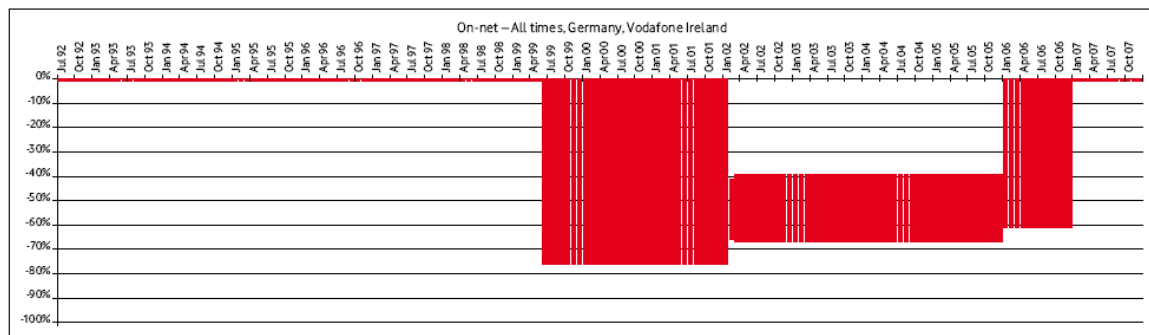
<sup>11</sup> As there are usually multiple tariff plans this on-net discount can vary from zero (in which case there is no on-net discounting and the on-net and off-net prices are the same) to a 100% discount (in which case on-net calls are free).

**Figure 2.1**  
**On-net/off-net price difference as percentage of off-net price of Irish incumbent MNOs**

**Ireland**

Eircell/Vodafone

First available data is from July 1992.

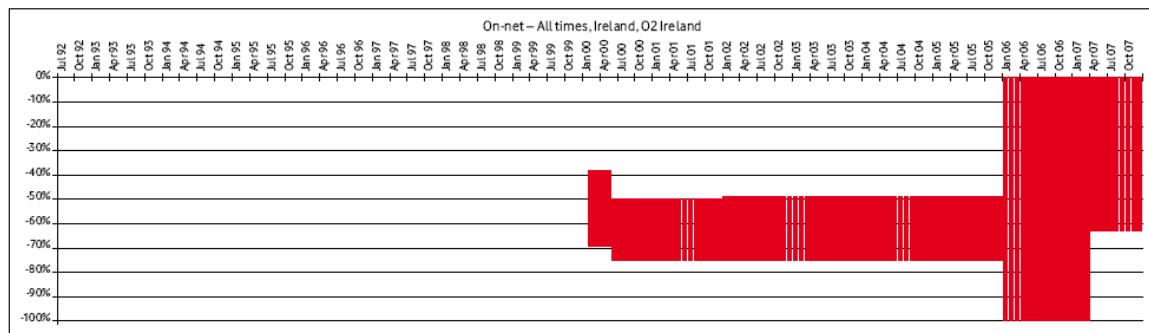


The first on-net discount appears to have been introduced in May 1999, with a discount of up to 75% below the off-net call prices. The range of discounts was later narrowed and reduced somewhat. In 2007 the discount was completely removed.

**Ireland**

Esat/BT

First available data is from February 2000.



Esat had already established an on-net discount in 2000, with a discount range of 38% to 69% below the off-net call prices. There have been significant variations in later years.

Source: Sannaes, H., "On-Net Pricing in Mobile Services", Vodafone Policy Paper Series, No. 8, April; 2008.

**Table 2.1**  
**Market share (by subscriber numbers) of late entrants into Irish mobile market**

		Market Share							
Date of entry		2001	2002	2003	2004	2005	2006	2007	2008
2001	Meteor Mobile (Ireland)	1.60%	3.40%	5.30%	9.0%	13.2%	17.0%	18.9%	19.4%
2005	Hutchison 3G (Ireland)	n/a	n/a	n/a	n/a	1.7%	2.3%	4.3%	6.0%

Source: TeleGeography GlobalComms 3.0

Further examples of successful entry and expansion in similar circumstances in France, Germany, Italy, Portugal and Spain are provided in Appendix A to this report. These

examples undermine the reliance that Concept places on Slovenia in regard to the impact of 2degrees in the counterfactual.

In addition, Concept takes as its counterfactual the MTRs in the Telecom and Vodafone undertakings. Concept is ignoring the deal between Vodafone and 2degrees which, according to Vodafone, contains terms that are more favourable to 2degrees than those contained in the original undertakings.<sup>12</sup>

## 2.2. The Factual

### 2.2.1. The Price Fall in the Factual

The Concept Report makes the assumption that mobile prices will fall by 60% over five years in the factual, due to the entry of 2degrees and regulation of MTRs. Concept bases this assumption predominately on the findings of a paper by Abrantes-Metz and Pereira (2007),<sup>13</sup> although Concept also suggests that the 60% assumption is consistent with broader international evidence.

The implication of Concept's assumption is that if there were three established MNOs in New Zealand today, mobile prices in New Zealand would be 60% lower than they actually are.<sup>14</sup> On its face, this is an aggressive assumption – a 60% price drop over five years is very large. Concept assumes annual price reductions of 10%-30% over 2009-2013 (Table 5 of the Concept Report); compare this, for example, to the Commission's assumption of a 5% price drop per annum (paragraph 792 of the Commission's Draft Report). As a "sanity check", it is worth comparing New Zealand's present prices with those in other OECD countries, and analyzing what 60% lower prices would imply.

Using the February 2009 Teligen t-basket OECD data used by the Commission, we have applied a 60% drop in prices in the low, medium and high user baskets, with the results shown in Figure 2.2, Figure 2.3, and Figure 2.4 respectively. The columns show the total annual price (fixed, voice and messaging) in USD PPPs (excluding tax) for each OECD country,<sup>15</sup> with New Zealand's price highlighted in yellow. New Zealand's initial relative position is consistent with the Commission's findings in Table 16 of its Draft Report. The black horizontal line shows what the price would be in New Zealand if we applied Concept's assumption that prices are currently 60% higher than they would be if there were three established MNOs in the New Zealand market.

With a 60% lower price New Zealand would have virtually the lowest mobile prices in the OECD. Given New Zealand's small population, low income per capita (compared to most

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<sup>12</sup> See Vodafone's Submission to the Commerce Commission on the Draft Report, dated 28 July 2009, page 75.

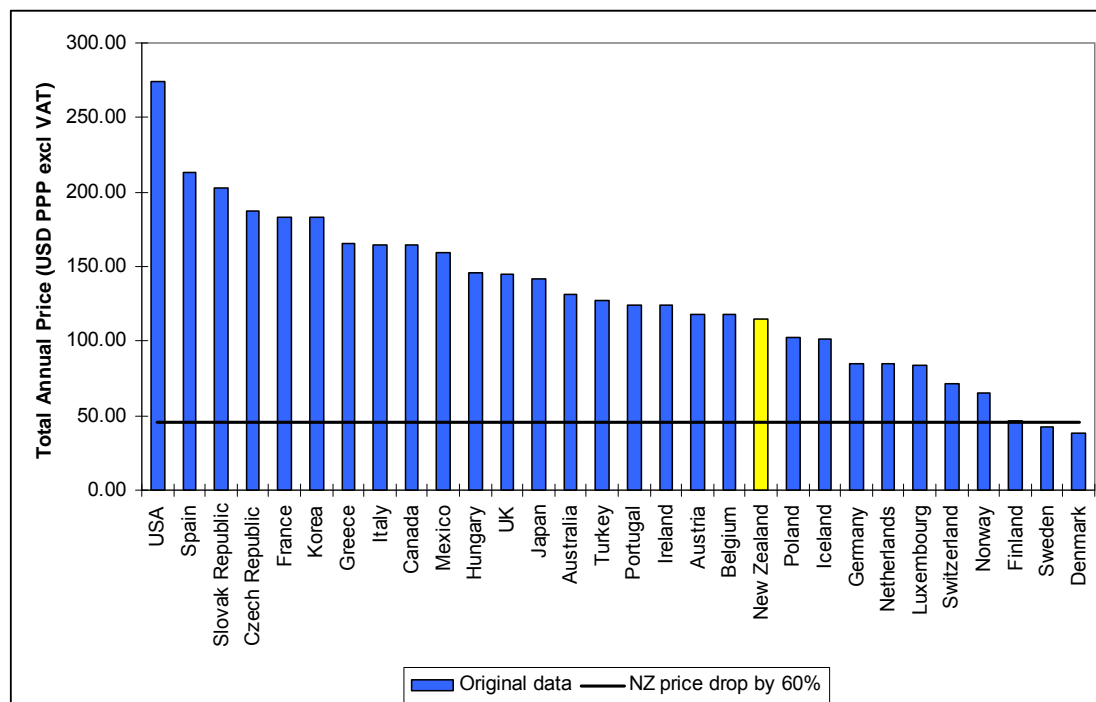
<sup>13</sup> Abrantes-Metz, Rosa and Pedro Pereira (2007), "The Impact of Entry on Prices and Costs", Available at SSRN: <http://ssrn.com/abstract=1013619>

<sup>14</sup> We recognize that prices in Concept's factual are not 60% lower than in Concept's counterfactual. Nevertheless, in developing its factual, Concept claims to be drawing on literature that demonstrates a 60% price drop due to entry.

<sup>15</sup> These are the same data as used by the Commission in its comparison of OECD prices in Tables 16 and 17 of the Draft Report.

OECD countries),<sup>16</sup> low population density and mountainous terrain, it does not seem credible that we would have significantly lower prices across all three user baskets than, e.g., the UK. The UK has five MNOs, a substantially greater population and population density, higher income per capita and, according to Ofcom, is considered by many commentators to be among the most competitive in the world.<sup>17</sup>

**Figure 2.2**  
**OECD Mobile Prices Low User Basket**

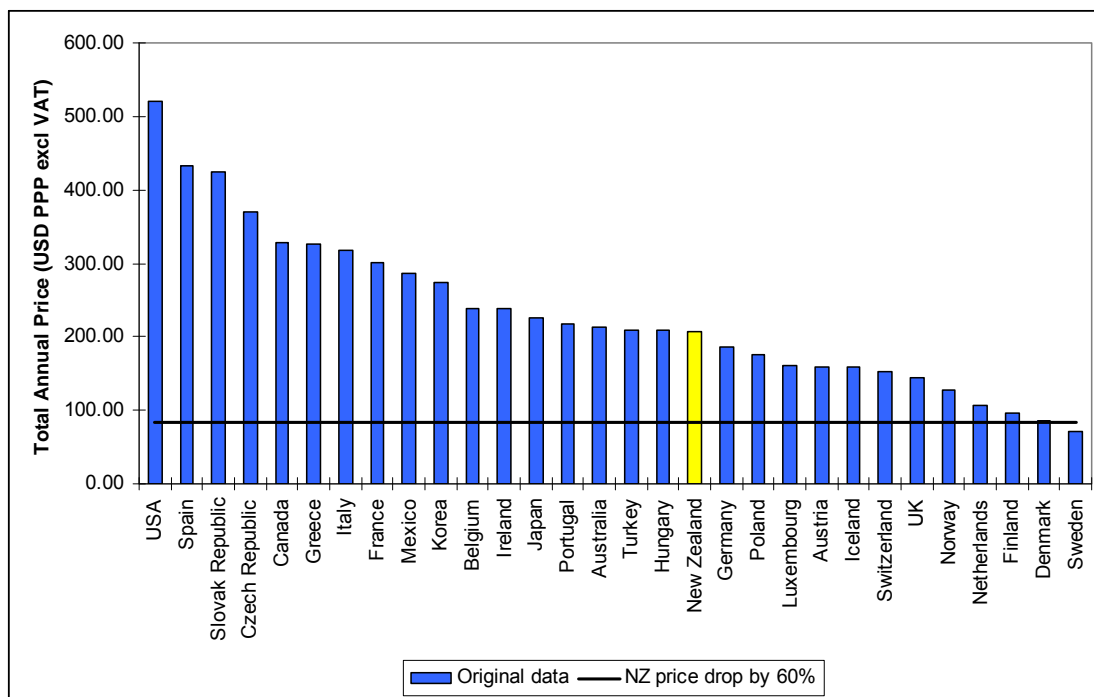


Source: Teligen T-basket, February 2009 and NERA calculations

<sup>16</sup> Using the most recent data available for all OECD countries (2007), New Zealand is ranked 22<sup>nd</sup> in the OECD by GDP per capita (US \$ constant prices and constant PPPs). Source: OECD.Stat.

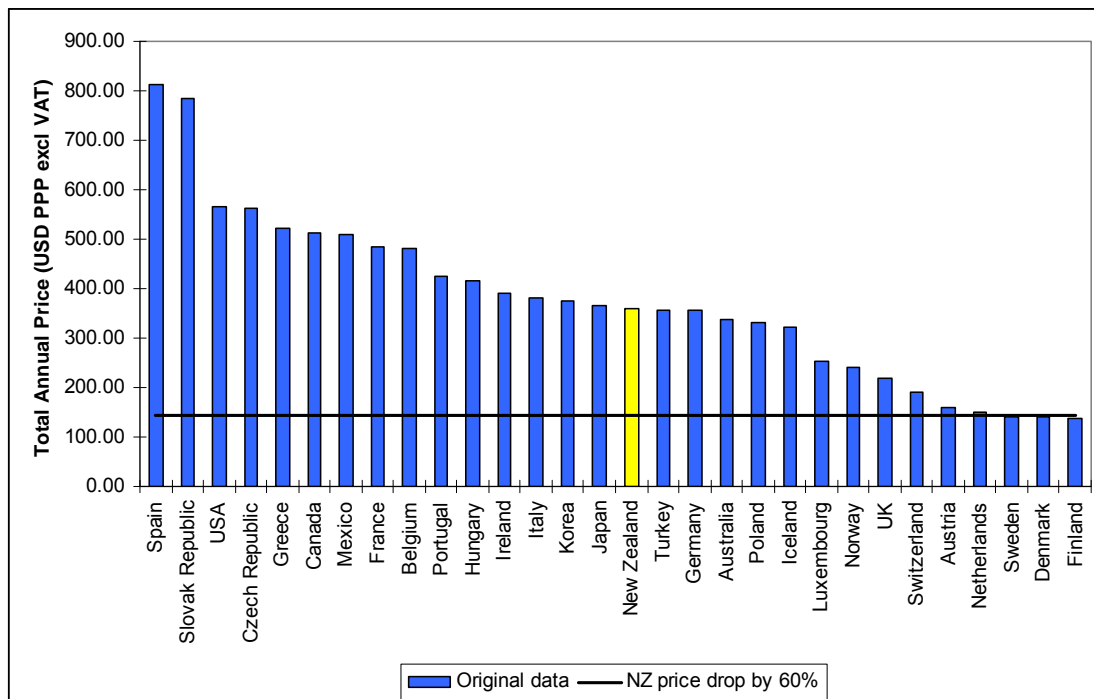
<sup>17</sup> Ofcom (2009), “Wholesale Mobile Voice Call Termination: Preliminary Consultation on Future Regulation”, 20 May.

**Figure 2.3**  
**OECD Mobile Prices Medium User Basket**



Source: Teligen T-basket, February 2009 and NERA calculations

**Figure 2.4**  
**OECD Mobile Prices High User Basket**



Source: Teligen T-basket, February 2009 and NERA calculations

We have a number of other critiques regarding Concept's assumption of a 60% fall in prices in the factual.

### 2.2.1.1. Lack of Controls

Concept supports its 60% price fall assumption with international benchmarking of the impact of mobile entry in Portugal, Egypt, Australia, Sweden and the UK. As Table 2.2 shows, however, at the time of entry, the conditions in many of these countries were not comparable to those in New Zealand today. These countries all have higher populations and, with the exception of Sweden, vastly different population densities and much lower mobile penetration rates at the time of entry. As a result, Concept overstates the weight that can be placed on the entry experiences in these countries.

**Table 2.2**  
**Comparison of Concept Report Benchmark Countries**

Country	Year of entry	Population in year of entry	Population density (people per sq km) in year of entry	Mobile penetration rate in year of entry
Portugal	1998	9,927,556	107	30.35%
Egypt	2006	78,887,007	79	22.90%
Australia	2003	19,731,984	3	72.08%
Sweden	2003	8,878,085	20	98.12%
UK	2003	60,094,648	245	90.93%
New Zealand	2009	4,268,660	16	106.00%

Sources: Commission's Draft Report, Concept Report, CIA World Factbook, ITU Telecommunications Indicators Database.

Moreover, Concept has not controlled for other factors to isolate the impact of entry, such as other drivers of price or the size of the economy. Consider, for example, Sweden. Concept states that the price in the OECD medium user basket in Sweden fell by approximately 60% between new entry in 2003 and 2006. However, this provides no control for other factors that may have led to prices falling. Indeed, between 2004 and 2006 (for which OECD data is publicly available), the total price in the OECD medium user basket for New Zealand, where no entry occurred, fell by 51%.<sup>18</sup> Over the same period, the average price change across all OECD countries in the OECD medium user basket was a 25% decrease. Since prices have fallen over the same period when entry has not occurred, it is not possible to definitively conclude that the entire price drop in Sweden was due to entry, without controlling for other factors.

In the case of Australia, the Concept Report points to the entry of Hutchison as evidence of the benefits of new entry into the mobile market. However, the Concept Report does not acknowledge that the ACCC has recently decided **not** to oppose a merger of the Hutchison and Vodafone businesses in Australia, primarily on the basis that neither business by itself is going to be able to make the required investment to continue competing effectively. In fact,

<sup>18</sup> Source: OECD Communications Outlook 2007 and 2005.

the ACCC went as far as stating that the "proposed merger may have a pro-competitive effect over the longer term" in the mobile broadband segment of the market (paragraph 78).<sup>19</sup> The effect of the ACCC's decision is that it was satisfied that the merger of the number 3 and number 4 MNOs in Australia would not substantially lessen competition (or equivalently, would not substantially increase market power). This undermines Concept's argument that the entry of Hutchison had a significant impact on competition.

In fact, there is also a broader question regarding the relevance of the entry evidence that Concept relies on. The question the Commission is analyzing in the MTAS investigation is whether regulation of MTRs would be to the long-term benefit of end users. As a consequence, in the CBA the key difference between the factual and counterfactual is that in one there is cost-based MTR regulation (factual), while in the other (counterfactual) there is not. Entry occurs in both. However, the literature and other evidence that Concept is basing its factual prices on relates to the impact of entry, not regulation. To put this another way, the literature and evidence that Concept relies on does not actually analyse the core question before the Commission, which is what impact regulation (as opposed to entry) has on prices.

#### 2.2.1.2. Abrantes-Metz and Pereira (2007)

The empirical evidence of Abrantes-Metz and Pereira (2007) is not as relevant as Concept claims, and does not support the conclusion that a 60% price drop would occur in New Zealand. Concept states (page 7) that:

*In our view, Abrantes-Metz and Pereira (2007), because it based [sic] on explicit estimates of the effects of a third entrant, provides the most definitive reference for expected price declines in New Zealand due to 2degrees' entry. That paper suggests New Zealand may experience price declines of around 60%.*

Abrantes-Metz and Pereira (2007) statistically test whether the distribution of mobile prices in Portugal is the same before and after 1998 (when entry occurred). They reject the null hypothesis that these distributions are the same. Abrantes-Metz and Pereira (2007) find that the median price dropped by approximately 60% after 1998. However, the fact that the price distribution changed after 1998 does not definitively tell us that the 60% price reduction after 1998 was *caused* by entry. Also, given that Abrantes-Metz and Pereira (2007) do not control for other factors that might influence prices, their paper does not provide a rigorous estimate of the effect of entry.

In fact, the Li (2008) paper referred to by Concept gives a more robust estimate.<sup>20</sup> Li uses data from 29 OECD countries and China over the time period 1991-2006. Li controls for a number of factors (GDP per capita, the mobile penetration rate, whether or not privatization of MNOs has occurred, whether or not there is an independent telecommunications regulator, mobile costs per unit and lagged mobile prices), and estimates the effect of the number of MNOs on mobile prices (although she does not explicitly control for the second, third, fourth,

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<sup>19</sup> Australian Competition and Consumer Commission (2009), "Public Competition Assessment: Vodafone Group plc and Hutchison 3G Australia Pty Limited – proposed merger of Australian mobile operations", 24 June.

<sup>20</sup> Li, Yan (2008), "Econometric Evidence on the Impact of Privatisation, New Entry and Independent Industry Regulator on Mobile Network Penetration and Expansion", ESRC Centre for Competition Policy Working Paper No. 08-35. Available at SSRN: <http://ssrn.com/abstract=1316325>

etc entrants). Li finds that the addition of one further MNO into the market lowers mobile prices by 2.9% (statistically significant at the 1% level).

Concept also cites the Abrantes-Metz and Pereira (2007) paper in regard to its finding that the effect of the third entrant in Portugal was to lower costs by 60%. This result is found using the same approach as outlined above for the 60% price fall, and thus the critique we make relating to prices applies equally to the reported fall in costs. In addition the economics literature typically finds that cost savings (as measured by productive efficiency gains) resulting from increased competition are generally no more than 5% per annum. For example, Daßler, Parker and Saal (2002) analyse the impact on productive efficiency (as measured by total factor productivity – TFP) from introducing competition into previously monopolized telecommunications markets.<sup>21</sup> Of the countries considered by Daßler et al (2002),<sup>22</sup> the introduction of competition in telecommunications markets led to the largest increase in annual TFP for the UK, with an average annual increase of 4.84% in the 1990 to 1994 period (with liberalization occurring in 1991).<sup>23</sup> In other countries liberalization led to much smaller increases in productivity, such as for Japan where TFP increased by only 1.06% on average in the 1990 to 1994 period (with liberalization occurring in 1990).

This literature makes the Abrantes-Metz and Pereira (2007) claim of a 60% reduction in costs look quite extraordinary.

Concept also refers to OPTA (2006),<sup>24</sup> regarding the theoretical finding that two players may not be enough for effective competition and the entry of a third player can improve the competitive dynamic. While this finding is relatively uncontroversial as a generalisation, there may be particular circumstances when a third entry is not socially optimal.<sup>25</sup> OPTA (2006, p.33) recognizes this, stating that:

*Within industries facing large economies of scale there is in some way a trade-off between the optimal number of firms on the market and the degree of competition within the market. The social optimum would be a market in which there is room for multiple firms (at least more than 2) operating at minimum efficient scale. **However, in some markets scale economies are such that there is only room for one (natural monopoly) or two firms operating at a minimum efficient scale. Another network operator entering the market would not be sustainable in the long run. Even though competition is not necessarily effective in this case, this may be the optimal situation from a total welfare point of view.** [emphasis added]*

We do not feel that we are in a position to opine on the likelihood of long-term success for 2degrees in New Zealand, although in light of the investments made to date by 2degrees we

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<sup>21</sup> Daßler, Thorlaf, David Parker and David Saal (2002), "Economic Performance in European Telecommunications 1978-1998: A Comparative Study", *European Business Review*, 14(3), 194-209,

<sup>22</sup> The countries considered are Denmark, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, The Netherlands, Spain, Switzerland, the UK and the USA.

<sup>23</sup> See Table IX of Daßler et al (2002), page 204.

<sup>24</sup> OPTA (2006), "Is Two Enough?", Economic Policy Note No. 6, September.

<sup>25</sup> There are also certain circumstances in which two firms can result in effective competition, and indeed the theory of contestability suggests that even a monopolist can be constrained to behave efficiently.

think that for analytical purposes it is appropriate to assume sustainability.<sup>26</sup> However, we do feel that we can make the point that there is little robust evidence to support the claim that mobile prices will drop by 60% in New Zealand due to regulation of the MTAS.

### 2.2.1.3. Mobile Service Rollout

Concept claims that New Zealand lags the rest of the world in mobile service rollout e.g., in 3G deployment and mobile broadband network capabilities. Concept argues that this “relative stagnation” of the New Zealand market is likely to result in more effective entry, with the implication that the 60% price fall in the factual is more likely to occur.

Telecom advises us that it is contesting the assertion that it has only recently deployed its first 3G network - Telecom states that it has in fact had a 3G network in New Zealand since 2004. However, if it was true that New Zealand is a laggard in rollout, there may be a valid rationale for this that is unrelated to mobile pricing or any lack of competition between Telecom and Vodafone. With the introduction of any new technology that involves substantial uncertainty as to its success and large fixed (and sunk) costs of deployment, there will be option value in waiting until the uncertainty is resolved. New Zealand MNOs may effectively have a “second mover advantage” by waiting to observe the success (or otherwise) of new technology deployments in other countries before rolling out that same technology in New Zealand.<sup>27</sup> Waiting therefore may allow New Zealand MNOs to reduce investment risk.<sup>28</sup>

### 2.2.2. Implied Factual Pass-Through Rate

It is possible to cross check the factual prices used by Concept against the implied pass-through rates. The factual prices used by Concept suggest pass-through rates outside any credible range.

In the Commission’s CBA of the FTM market, a specific pass-through profile is assumed which is used to translate the change in the MTR to a change in retail prices. The approach taken in the Concept Report is quite different. The retail price path is simply assumed and there is no direct linkage between the assumed MTRs and the assumed retail prices.

In fact, by considering the relationship between the Concept Report’s assumed factual prices and the Commission’s factual MTRs (which Concept uses), we can determine the pass-through rate in the mobile-to-mobile (MTM) market implied by Concept’s analysis. Table 2.3 below shows the assumed reduction in the MTR and prices in the factual and the pass-through implied by these figures, while Figure 2.5 presents the implied pass-through graphically. Also shown is the implied pass-through from the Commission’s assumptions in the fixed-to-mobile (FTM) market.

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<sup>26</sup> Whether under present ownership or otherwise.

<sup>27</sup> This is in contrast to first mover advantage.

<sup>28</sup> Novy-Marx (2007) shows that the option value of waiting remains significant even in competitive markets. Novy-Marx, Robert (2007), “An Equilibrium Model of Investment Under Uncertainty”, *Review of Financial Studies*, 20(5), 1461-1502.

**Table 2.3**  
**Implied Pass-Through of MTR to Retail Prices**

	2009	2010	2011	2012	2013	2014	2015
Δ factual MTR	\$0.010	\$0.008	\$0.086	\$0.006	\$0.005	\$0.004	\$0.005
Concept Δ MTM price	TRI/VRI[						]
Commission Δ FTM price	\$0.009	\$0.007	\$0.073	\$0.006	\$0.005	\$0.004	\$0.006
Concept pass-through	TRI/VRI[						]
Commission pass-through	88.25%	84.70%	85.17%	93.38%	102.79%	109.89%	111.60%

**Figure 2.5**  
**Implied Pass-Through of MTRs in the Factual**

TRI/VRI[  
]

Table 2.3 and Figure 2.5 show that the implied Concept pass-through varies between TRI/VRI[ ] and TRI/VRI[ ] and also that the pass-through varies greatly over the period. Once again, this analysis raises questions over the credibility of Concept's factual price assumptions. Even if regulation of the MTAS led to more intense competition in the mobile services market, it seems extreme to assume pass-through rates of up to TRI/VRI[ ]. This compares with the Commission's assumed factual pass-through rate of between approximately 85% and 110%.

### 2.2.3. Factual Benchmark Termination Rates

In Table 3 of the Concept Report, Concept appears to have accepted the Commission's factual benchmarks, so many of our earlier criticisms of these benchmarks also apply here.<sup>29</sup> To summarise, our key views on the benchmarks are:

- MTRs should be benchmarked against actual regulated rates, rather than cost modeled rates;
- The 75<sup>th</sup> percentile of the benchmarked sample addresses the asymmetric risk of regulatory error; and
- The 10% per annum fall in the cost-based benchmark is based on a very small sample and may not pass a "sanity" check.

<sup>29</sup> See NERA (2009), "MTAS Benchmarking – Response to the Commission Comments on Undertakings", Report for Telecom New Zealand, 6 May; and NERA (2009), "Regulation of the MTAS: Review of the Commission's Draft Report", Report for Telecom New Zealand, 28 July.

## 2.2.4. LRIC versus TSLRIC

The Concept Report refers to the submission of 2degrees that MTRs should be based on a “LRIC” estimation of costs rather than “TSLRIC”. The 2degrees submission would result in a radically new approach to access pricing in New Zealand, and we urge the Commission to be very cautious.

The 2degrees submission might be described as advocating an extremely “pure” or narrow interpretation of LRIC. The argument is that as Telecom and Vodafone (and now of course 2degrees) provide call origination, text messaging, etc, then the actual incremental costs of supplying voice (or whatever) termination services are very small. In other words, the costs of providing termination, origination, etc, are mainly common across those services, and the incremental costs of supplying just any one of those services are small. It is argued that this approach to calculating LRIC would result in MTRs of 1 cent per minute, or even something “considerably lower” (page 25 of the Concept Report).<sup>30</sup> Compare this to the Commission’s (voice) benchmark estimate of 7.2 cents per minute (in 2009). In the scheme of things, this is a large difference, and adopting the 2degrees approach would make New Zealand an outlier (see, e.g., Table 27 of the Commission’s Draft Report).

We recognize that a November 2008 FCC consultation document has raised the issue of the appropriateness of TELRIC.<sup>31</sup> However, as far as we are aware, there has been no decision made on this issue by the FCC, and we suspect that the issue will be controversial. In particular, it seems to us to be unlikely that such a “pure” approach to LRIC would replicate what generally occurs in competitive markets. In competitive markets, firms need to recover their common costs, and will tend to do so where demand is most inelastic. But the 2degrees approach would rule out MNOs recovering any of their common costs from termination services, even though these tend to be regarded as among the most inelastic.<sup>32 33</sup>

Certainly any such approach would be a radical departure from what has become standard regulatory practice in New Zealand, and indeed overseas. TSLRIC, including a “reasonable allocation of forward-looking common costs”, is of course referred to in the Telecommunications Act, as paragraph 432 of the Commission’s Draft Report notes. Furthermore, an allocation of common costs is included in the Commission’s building blocks analysis when regulating electricity and gas distributors under the Commerce Act.

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<sup>30</sup> In calculating total surplus, Concept’s CBA model uses a LRIC of call origination and termination of 1.24c per end-use and applies this for the cost of a mobile-to-mobile call. The Concept Report appears to set out a different approach to calculating the long-run marginal cost of a voice call, with reference to the off-net MTR in the counterfactual and the split between on-net and off-net MTM minutes. The exact approach being described in the Concept Report is not clear.

<sup>31</sup> Federal Communications Commission (FCC), Order On Remand and Report and Order and Further Notice of Proposed Rule Making, 5 November 2008, available at [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/FCC-08-262A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-08-262A1.pdf).

<sup>32</sup> See Dewenter and Kruse (2005), noting that demand for off-net calls is less elastic than for other services, so this would tend to result in relatively high termination rates. Dewenter, Ralf and Jorn Kruse (2005), “Calling Party Pays or Receiving Party Pays? The Diffusion of Mobile Telephony with Endogenous Regulation”, Helmut-Schmidt University, Discussion Paper No. 43.

<sup>33</sup> It has been argued that even TSLRIC understates the price that would be charged in a competitive market – see, e.g., Hausman, Jerry A (2000) “Regulated costs and prices in telecommunications”, in Gary Madden and Scott J Savage (eds) *The International Handbook of Telecommunications Economics*, Volume II, Edward Elgar.

### 3. Detriments in Concept's CBA

Concept's CBA is incomplete, as it does not incorporate any detriments (so effectively excludes the "costs" from cost benefit analysis). In particular, Concept dismisses the waterbed effect and does not model it, and Concept does not include any of the direct costs of regulation. We briefly discuss each of these issues in the following sections.

#### 3.1. The Waterbed Effect

The Concept Report analysis ignores the waterbed effect of MTR regulation. The following statement appears on page 25 of the Concept Report:

*While a waterbed adjustment may be appropriate in a perfectly competitive market, in the New Zealand market, which is currently characterized by high concentration and high barriers to entry, a material waterbed effect is extremely unlikely.*

It is correct that the waterbed effect is a positive function of competition. However, the Concept statement seems to imply that the effect only exists if there is perfect competition. This is clearly wrong – there would be a waterbed effect even if there was a monopolist MNO.<sup>34</sup> The empirical analysis of Genakos and Valletti (2009) finds that the waterbed effect is significant.<sup>35</sup> Therefore Concept's failure to model a waterbed effect is a significant oversight.

#### 3.2. Direct Costs of Regulation

Concept's CBA does not include any costs associated with the regulatory price-setting process. As the Commission notes in its Draft Report (at paragraph 866), in the factual the Commission and interested parties will incur costs associated with the regulatory process in determining price and non-price terms for the MTAS. To the extent that Concept's CBA is a stand alone model that estimates the net benefits of regulation in the mobile market only, then any direct regulatory costs need to be incorporated into the model. It may be, however, that Concept's CBA is a complement to the Commission's CBA in the FTM market, which does include the direct regulatory costs. Many of the direct regulatory costs may be common across the FTM and mobile services markets, and thus the incremental regulatory costs in the mobile market may be low. Nonetheless, such costs still need to be included in the CBA.

### 4. Other CBA Issues

#### 4.1. Elasticity Estimates

The CBA in the Concept Report assumes an own-price demand elasticity for mobile voice services of between -1.1 in 2008 falling to -0.6 in 2015. Concept's model is relatively sensitive to changes in these elasticity estimates. For example, if the demand elasticity were -0.4 across the entire time period analysed, Concept's 5-year NPV of total surplus falls from

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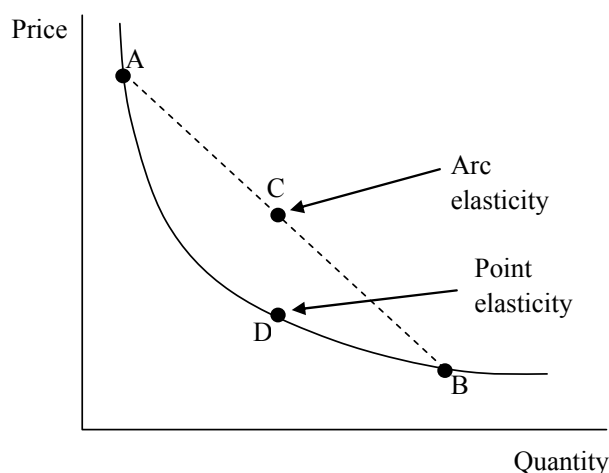
<sup>34</sup> See, e.g., page 6 of Genakos and Valletti (2009) for a description of the mechanism.

<sup>35</sup> Genakos, Christos and Tommaso Valletti (2009), "Testing the "Waterbed" Effect in Mobile Telephony", Working Paper, April.

\$0.3b-\$1.3b to \$0.2b-\$0.8b, while the 5-year NPV of consumer surplus falls from \$0.5b-\$2.4b to \$0.4b-\$2.0b.

Concept’s assumed elasticity estimates are based in part on its own elasticity calculations from various “case studies” where mobile entry has occurred: Australia, Sweden and the UK. Concept’s estimates are “arc” elasticities: the elasticity is measured between two different points on the demand curve. While estimating arc elasticities can be a valid approach, it assumes that the demand curve between two points is linear, and estimates the elasticity at the midpoint of that linear demand curve. Thus, to the extent that the demand curve may be non-linear (concave or convex), the arc elasticity is less accurate than estimating the elasticity at a particular point on the demand curve (the “point” elasticity).<sup>36</sup> This is shown in Figure 4.1 below: if elasticity is measured between points A and B by the arc elasticity, it gives the elasticity at point C. This will be a less accurate estimate of the point elasticity at point D when the demand curve is convex, as shown here.

**Figure 4.1**  
**Comparison of Arc and Point Elasticity**



Furthermore, arc elasticity should be measured between two points *on the same demand curve*. Any estimate of the arc elasticity therefore needs to control for other factors that may shift the demand curve. Concept has not done this. While Concept suggests that its analysis is conducted over “relatively narrow time frames”, which it suggests would minimize the effects of other variables, in a dynamic market such as that for mobile services we would not consider the two to three year timeframes used by Concept to be “narrow”. Indeed, consumer demand for mobile services could change quite considerably in the space of two or three years. By comparing two points in different years when dynamism is present, Concept may in fact be taking two points on two different demand curves.

<sup>36</sup> See Frederick George Hay, Christine Oughton and Andrew S. Skinner (1996), *Intermediate Microeconomics: A Perspective on Price Theory*, Manchester University Press, p.60, who note that the arc elasticity is not a “true” measure given that the demand curve may not be linear.

The approach often used to more accurately estimate demand elasticity is regression analysis, controlling for other prices and “demand shift” variables. More rigorous regression techniques are used in all of the studies referred to in Table 8 of the Concept Report that gives elasticity estimates from the literature. We consider that these estimates are considerably more reliable than those calculated by Concept.

Finally, we note some problems with Concept’s interpretation of the elasticity estimates from the literature that Concept considers:

- Concept reports an elasticity from Hausman (1999) of -0.55,<sup>37</sup> whereas the correct figure is actually -0.51. Hausman (1999) notes that the elasticity estimates are taken from Hausman (1997),<sup>38</sup> and in that paper the elasticities are reported as -0.41 using ordinary least squares and -0.51 using instrumental variables regression;
- From Dewenter and Haucap (2007),<sup>39</sup> Concept reports an elasticity of -0.67 for postpaid subscribers. This figure is a long-run elasticity, while Dewenter and Haucap (2007) estimate the short-run elasticity as -0.24. Given that the elasticity estimates are used in the CBA on an annual basis, a short-run elasticity estimate is likely to be more appropriate; and
- Concept reports the elasticity from Tishler, Ventura and Watters (2001) of -0.8.<sup>40</sup> However, the elasticity reported in this paper is not the elasticity of mobile calling volumes with respect to mobile calling prices, but rather the elasticity of cellphone purchase with respect to mobile calling prices. It therefore has no relevance to Concept’s CBA which determines the impact of changes in mobile calling prices on changes in mobile calling volumes.

In sum, little weight should be placed on Concept’s own elasticity calculations, and the literature suggests a plausible elasticity is in the range of -0.24 (Dewenter and Haucap’s short-run elasticity) to -0.62 (DotEcon’s elasticity as cited in the Concept Report).

## 4.2. Terminal Value

Concept’s CBA includes a terminal value, which Concept argues “is necessary to take into account the benefits beyond 2015 that result from the increased regulation that mobile termination regulation will aid” (presumably the first “regulation” in this quote should be “competition”). The inclusion of a terminal value significantly increases Concept’s calculated net benefits of regulation. Inclusion of a terminal value increases total surplus and consumer surplus by a factor of approximately six (total surplus: from a range of \$0.3b-\$1.3b

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<sup>37</sup> Hausman, Jerry (1999), “Cellular Telephone, New Products, and the CPI”, *Journal of Business and Statistics*, 17(2), 188-194.

<sup>38</sup> Hausman, Jerry (1997), “Valuing the Effect of Regulation on New Services in Telecommunications”, *Brookings Papers on Economic Activity, Microeconomics*, 1-54.

<sup>39</sup> Dewenter, Ralf and Justus Haucap (2007), “Demand Elasticities for Mobile Telecommunications in Austria”, Ruhr Economic Papers No. 17.

<sup>40</sup> Tishler, Asher, Ron Ventura, and John Watters (2001), “Cellular Telephones in the Israeli Market: the Demand, the Choice of Provider, and Potential Revenues”, *Applied Economics*, 33, 1479-1492.

without a terminal value to \$1.6b-\$8.2b with a terminal value; and consumer surplus: from a range of \$0.5b-\$2.4b without a terminal value to \$2.7b-\$15.3b with a terminal value).

In our view the inclusion of a terminal value is inappropriate. There are significant uncertainties in estimating long-term benefits and costs, particularly in the dynamic mobile services market. Assumptions about the benefits and costs beyond 2015 are therefore speculative. In the Commission's 2005 MTR investigation, the Commission made a similar finding, stating that extending the study period (which, at the time, ended in 2010) would involve considerable uncertainty.<sup>41</sup>

Concept's approach to calculating the terminal value is to assume that the (total or consumer) surplus in 2015 grows at a rate of 2% per annum in perpetuity. The assumed growth rate may be due to the difference between the factual and counterfactual prices and/or quantities increasing over time relative to their 2015 values. For example, it may be that prices in the factual and counterfactual continue to fall in perpetuity, but with the factual falling further than the counterfactual. However, prices are unlikely to continue to fall in perpetuity, as they may ultimately be bounded by costs or else zero. Alternatively, it may be that prices in the factual and counterfactual stabilize at some point, and the difference between them remains unchanged in perpetuity (with the assumed 2% per annum growth perhaps resulting from differences in the quantities). However, it seems implausible to assume that prices would stabilize when it is assumed that competition will continue to increase. Moreover, it cannot be known with any certainty at what time or at what level prices will stabilize. This illustrates our point that to calculate a terminal value, and thereby implicitly make assumptions as to future price and quantity changes past five years, is speculative and subject to considerable uncertainty.<sup>42</sup>

### 4.3. Surplus Transfers

In section 5, Concept states that:

*Given the goals of the Commerce Act, the consumer surplus estimates are more relevant than those for total surplus.*

We presume that this should actually be a reference to section 18 of the Telecommunications Act, which is similar to the purpose statement in the Commerce Act.

Regardless, as we pointed out in our 28 July 2009 report in these proceedings, (most) economists have associated the meaning of "long-term benefit of end-users" with the economic concept of maximizing economic efficiency, and we refer again to the comprehensive report on this matter filed with the Commission by Professor Michael Katz in

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<sup>41</sup> Commerce Commission (2005), "Schedule 3 Investigation into Regulation of Mobile Termination", Final Report, 9 June, paragraph 502.

<sup>42</sup> Indeed, for all we know at this point in time, regulation may actually be introduced under the counterfactual in the future, particularly if the counterfactual turns out as Concept assumes (e.g., the failure of 2degrees).

2004.<sup>43</sup> This view implies that it is the total surplus estimates that are more relevant than the consumer surplus ones, contrary to the Concept view.

The Commission's primary argument for placing most weight on the consumer surplus rather than total surplus estimates appears to be captured by the following statement from the Draft Report (paragraph 48):

*In attempting to replicate the outcomes of a competitive market, where MTAS is supplied at cost-based prices into the downstream markets, the Commission considers that it is appropriate to place significant weight on the resulting gains in consumer surplus.*

However, this is an example of the Commission's failure to properly apply the two-sided platform framework, which the economics literature unanimously finds applies to mobile networks. In particular, there is no reason to assume that price would equal "cost" on any one side of a two-sided platform under competitive conditions.<sup>44</sup> For example, consumers are unlikely to pay a "cost-based" price to shop at a mall, and viewers of free-to-air television do not pay a "cost-based" price.

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<sup>43</sup> Katz, Michael (2004), "Competition, Efficiency, and the Long-Term Benefit of End-Users", Submission before the New Zealand Commerce Commission, 30 November.

<sup>44</sup> See Wright, Julian (2004), "One-sided Logic in Two-sided Markets", *Review of Network Economics*, 3(1), 44-64.

## Appendix A. Performance of Late Entrants to Mobile Markets

In this appendix we provide examples of successful late entrant MNOs (companies that were 3<sup>rd</sup> or 4<sup>th</sup> to enter the market) in different European countries. These companies have survived and have built material levels of market share despite on-net/off-net pricing by incumbent companies and above-cost mobile termination rates.

Most European regulators started regulating mobile termination rates only after 2001-02 when various EU directives requiring them to undertake SMP investigations were passed. The average EU-15 MTR was 18.76€ cents in July 2002. This decreased to 12.40€ cents in October 2005.<sup>45</sup> Thus MTRs in most EU 15 countries during and before this time period were high and likely above cost.

### A.1. Bouygues Telecom (France)

Bouygues Telecom started operations in France in 1996. It was the third company to enter the market after Orange France, which started operating its GSM network in 1992, and SFR, which entered the market in 1993.

In the period after entry Bouygues faced on-net/off-net pricing by the incumbents. This can be seen in Figure A.1 which shows the difference between the on-net and corresponding off-net price as a percentage of the off-net price.<sup>46</sup> Despite this on-net/off-net pricing by the incumbents, Bouygues survived and managed to achieve a relatively significant market share (Table A.1).

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<sup>45</sup> Source: Various EU Implementation Reports.

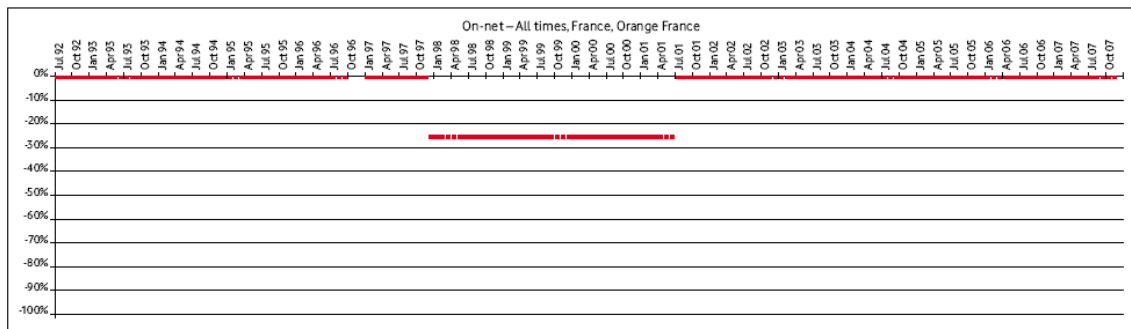
<sup>46</sup> As there are usually multiple tariff plans this on-net discount can vary from zero (in which case there is no on-net discounting and the on-net and off-net prices are the same) to a 100% discount (in which case on-net calls are free).

**Figure A.1**  
**On-net/off-net price difference as percentage of off-net price of French incumbent MNOs**

**France**

**Orange/Itineris**

First available data is from October 1992.



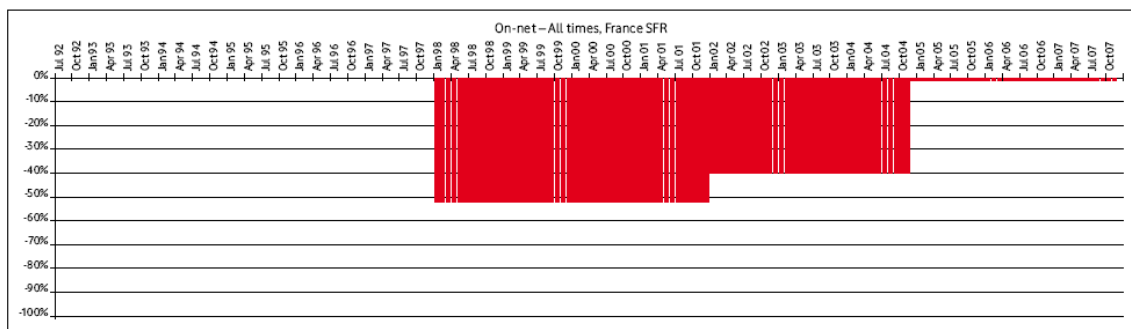
The first indication of reduced on-net prices appears in December 1997 with a general 25% reduction of all on-net calls below the price of off-net.

The on-net discount is removed in 2001.

**France**

**SFR**

First available data is from January 1998.



At the beginning of 1998 SFR already had established a significant discount on on-net calls over off-net, with up to 52% discount. This tariff was valid from July 1997. Unfortunately the data available does not allow a more detailed analysis of the time before mid 1997.

The on-net discount is removed in 2004.

Source: Sannaes, H., “On-Net Pricing in Mobile Services”, Vodafone Policy Paper Series, No. 8, April; 2008.

**Table A.1 Market share (by subscriber numbers) of Bouygues Telecom in French mobile market**

		Market Share							
Date of entry		2001	2002	2003	2004	2005	2006	2007	2008
1996	Bouygues Telecom (France)	18.0%	15.2%	16.2%	17.1%	17.8%	17.8%	18.1%	18.0%

Source: TeleGeography GlobalComms 3.0

## A.2. E-Plus Mobilfunk (Germany)

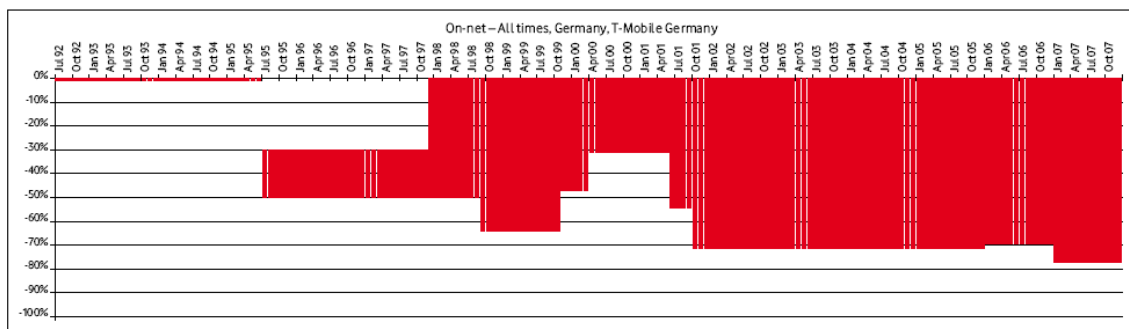
E-Plus was the third MNO to enter the German market in 1994. Despite on-net/off-net pricing by the incumbents<sup>47</sup> (Figure A.2), E-Plus survived and had a market share of 16.6% in 2008 (Table A.2).

**Figure A.2**  
**On-net/off-net price difference as percentage of off-net price of German incumbent MNOs**

### Germany

#### DeTeMobile/T-Mobil/T-Mobile

First available data is from October 1992.

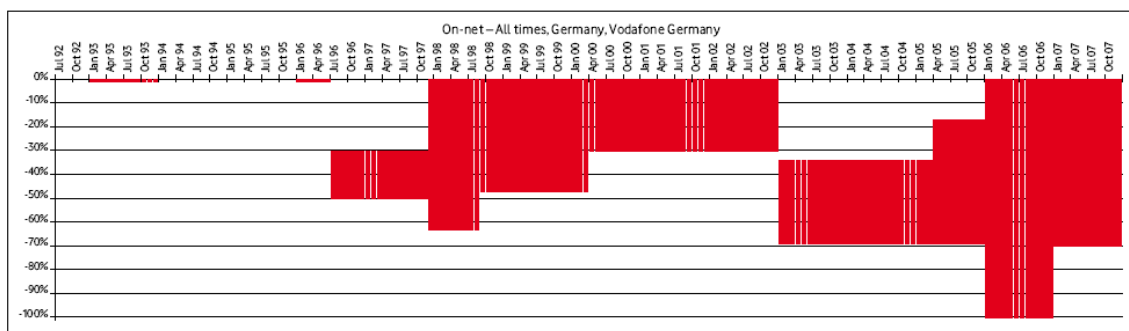


The discount for on-net calls below off-net first appears in July 1995. A discount between 30% and 50% was applied to on-net calls below the off-net call price. The discount level varied considerably over time, and by end of 2002 the on-net discounts at peak time varied between 32% and 70%, and at off-peak times between 0 and 25%. In 2007 both peak and off-peak times have the same discount range of 0 – 77%.

### Germany

#### Mannesmann/Vodafone

First available data is from January 1993.



The on-net discount appears to have been first introduced in July 1996, with a 30% to 50% discount below the off-net call prices. The discount has changed over the years, and by end of 2002 the discount range was 0 to 30%, depending on package. Later the range has varied significantly.

Note: There is a gap in the source data for the years 1994 and 1995.

Source: Sannaes, H., “On-Net Pricing in Mobile Services”, Vodafone Policy Paper Series, No. 8, April; 2008.

<sup>47</sup> T-Mobile (entered 1992) and Mannesmann/Vodafone (entered 1992).

**Table A.2**  
**Market share (by subscriber numbers) of E-Plus Mobilfunk in German mobile market**

		Market Share							
Date of entry		2001	2002	2003	2004	2005	2006	2007	2008
1994	E-Plus Mobilfunk	13.3%	12.3%	12.7%	13.3%	13.6%	14.8%	15.2%	16.6%

Source: TeleGeography GlobalComms 3.0

### A.3. Telefonica O2 (Germany)

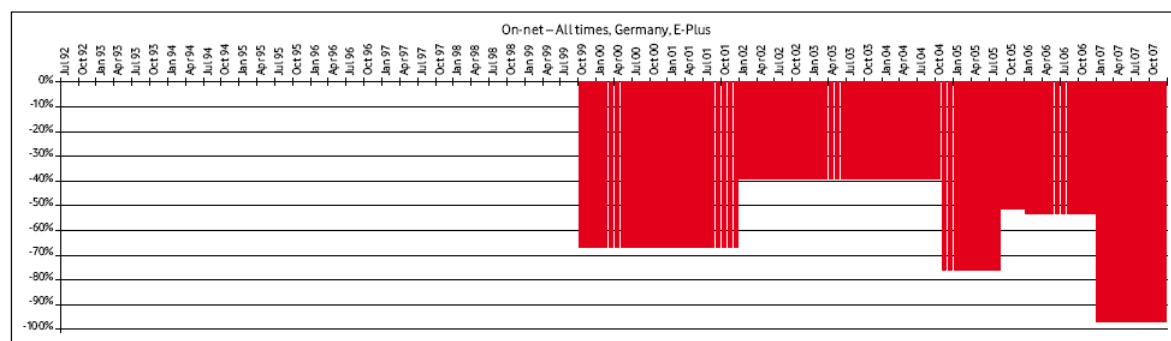
Telefonica O2 was the fourth MNO to enter the German market in 1998 and it has built up its market share despite on-net/off-net pricing by all three previous entrants (Figure A.2, Figure A.3 and Table A.3).

**Figure A.3**  
**On-net/off-net price difference as percentage of off-net price of E-Plus in German Mobile Market**

Germany

E-Plus

First available data is from October 1999.



In 1999 E-Plus had already established an on-net discount of up to 67% below the off-net call price. The range has since varied a lot.

Source: Sannaes, H., “On-Net Pricing in Mobile Services”, Vodafone Policy Paper Series, No. 8, April; 2008.

**Table A.3**  
**Market share (by subscriber numbers) of Telefonica O2 in German Mobile Market**

		Market Share							
Date of entry		2001	2002	2003	2004	2005	2006	2007	2008
1998	Telefonica O2 (Germany)	6.5%	7.7%	8.6%	10.4%	12.3%	12.9%	12.8%	13.2%

Source: TeleGeography GlobalComms 3.0

## A.4. Wind (Italy)

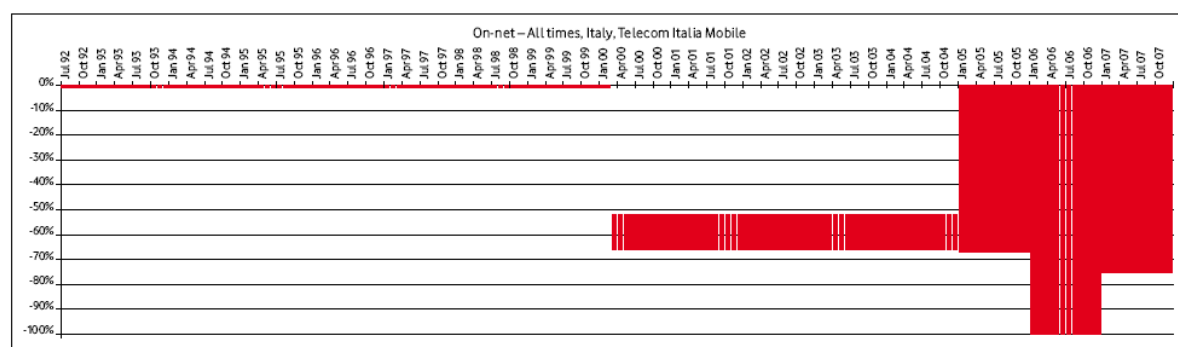
Wind entered the Italian mobile market in 1999 and was the third operator to enter the market<sup>48</sup>. Wind has built up a material market share (Table A.4) notwithstanding the on-net/off-net pricing by the incumbent (Figure A.4).

**Figure A.4**  
**On-net/off-net price difference as percentage of off-net price of Italian incumbent MNO**

Italy

Telecom Italia Mobile/TIM

First available data is from July 1992.



Discounted prices for on-net calls appear to be introduced in March 2000, with a discount range of 52% to 66%. In 2007 the range is 0 – 75%.

Source: Sannaes, H., “On-Net Pricing in Mobile Services”, Vodafone Policy Paper Series, No. 8, April; 2008.

**Table A.4**  
**Market share (by subscriber numbers) of Wind in Italian Mobile Market**

		Market Share							
Date of entry		2001	2002	2003	2004	2005	2006	2007	2008
1999	Wind (Italy)	15.9%	16.4%	17.6%	19.1%	19.2%	18.3%	17.4%	18.7%

Source: TeleGeography GlobalComms 3.0

<sup>48</sup> TIM and Omnitel (now Vodafone) started operating their GSM networks in 1995.

## A.5. Optimus (Portugal)

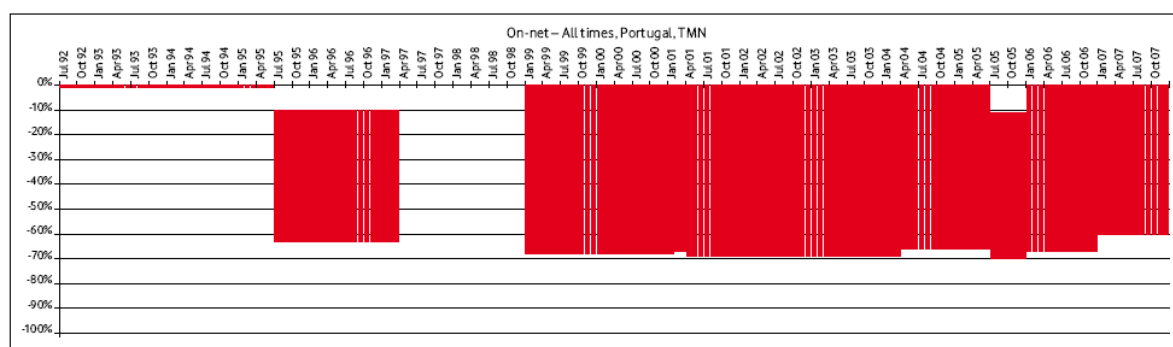
Optimus was the third operator to enter the Portuguese market in 1998<sup>49</sup>. Optimus was able to successfully grow its market share (Table A.5) and compete with the incumbent companies despite on-net/off-net pricing by one of the incumbents (Figure A.5).

**Figure A.5**  
**On-net/off-net price difference as percentage of off-net price of Portuguese incumbent MNO**

Portugal

TMN

First available data is from July 1992.



Discounted prices for on-net calls appear to have been introduced in July 1995, with a discount range of 10% to 63% below off-net call prices. The on-net discounts have been relatively stable right up until today.

Note: There is a gap in the source data from April 1997 to December 1998.

Source: Sannaes, H., “On-Net Pricing in Mobile Services”, Vodafone Policy Paper Series, No. 8, April; 2008.

**Table A.5**  
**Market share (by subscriber numbers) of Optimus in the Portuguese Mobile Market**

		Market Share							
Date of entry		2001	2002	2003	2004	2005	2006	2007	2008
1998	Optimus (Portugal)	14.7%	15.3%	15.9%	16.3%	16.6%	16.6%	16.7%	16.9%

Source: TeleGeography GlobalComms 3.0

<sup>49</sup> TMN and Vodafone entered the Portuguese market in 1992.

## A.6. Orange (Spain)

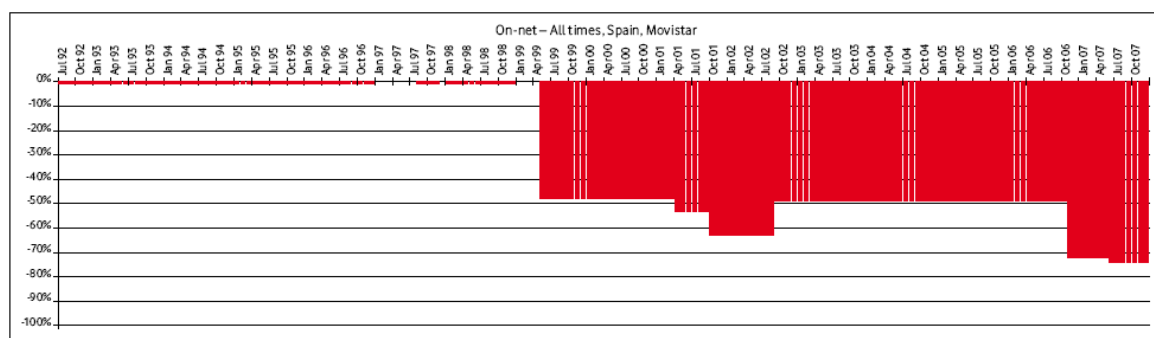
Retevisión Movil/Orange España was the third mobile operator to enter Spain in 1999 and faced on-net/off-net pricing by the two incumbents (Figure A.6) – Telefonica and Vodafone – which both started operations in 1995. Orange España survived and had a 21.7% market share in 2008 (Table A.6).

**Figure A.6**  
**On-net/off-net price difference as percentage of off-net price of Spanish incumbent MNOs**

### Spain

#### Telefonica/Movistar

First available data is from July 1992.

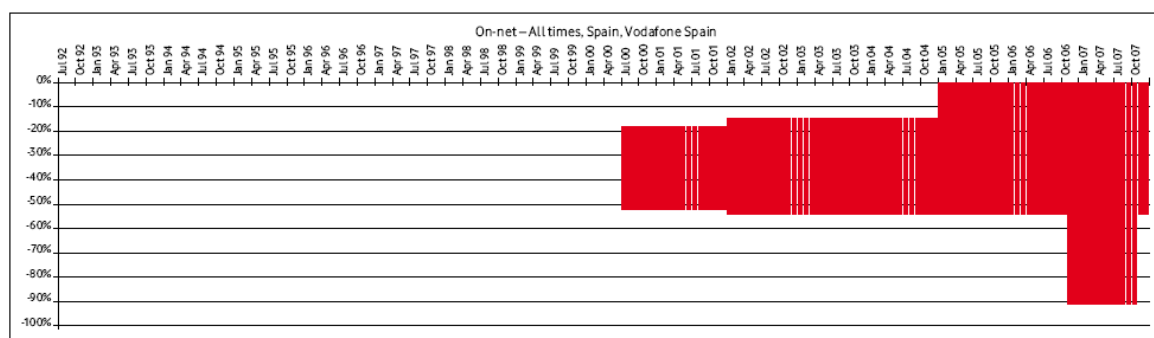


The source data suggest that a major tariff review took place in May 1999, and on-net prices became different from fixed line call prices at that time, so it is likely that this review also introduced the on-net discounts relative to off-net prices.

### Spain

#### Vodafone

First available data is from July 2000.



The on-net discount appears to follow (or lead on) the Movistar discount quite closely. The discount levels are rather similar.

Source: Sannaes, H., “On-Net Pricing in Mobile Services”, Vodafone Policy Paper Series, No. 8, April; 2008.

**Table A.6**  
**Market share (by subscriber numbers) of Orange Espana in the Spanish Mobile Market**

		<b>Market Share</b>							
Date of entry		2001	2002	2003	2004	2005	2006	2007	2008
1996	Orange Espana (Spain)	17.6%	19.3%	21.8%	23.7%	23.9%	23.6%	22.1%	21.7%

Source: TeleGeography GlobalComms 3.0

# NERA

Economic Consulting

NERA Economic Consulting  
Level 8, PWC Tower  
113-119 The Terrace  
PO Box 699  
Wellington 6140  
Tel: +64 4 819 2550  
Fax: +64 4 819 2552  
[www.nera.com](http://www.nera.com)