

concept economics



REPORT

**ASSESSMENT OF THE
CONSUMER BENEFITS OF
MOBILE TERMINATION
REGULATION IN NEW
ZEALAND**

PUBLIC VERSION

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EXECUTIVE SUMMARY

This report assesses the effects of mobile termination regulation on consumer benefits and total surplus relating to the mobile market. Key to this analysis is defining the relevant factual and counterfactual outcomes – that is, what would happen with and without regulation, respectively.

Factuals – what would happen with regulation?

International evidence shows that mobile entry, particularly by a third player, brings with it very substantial price cuts – around 60% for voice services in the first 2 to 3 years of entry (as well as pre-entry cuts). We analyse one scenario that assumes a price fall of 60% over the first five years of entry for voice, SMS, MMS and data, with the bulk occurring in the two years following the implementation of regulation (ie, 2011 and 2012), and another scenario conducted as a sensitivity test which assumes price reductions due to entry of 30%.

Counterfactuals – what would happen without regulation?

Our view is that without regulation, the ability of an entrant to engage in full-scale competition with the incumbents in the New Zealand market – that is, to contest all customer segments and expand its network geographically – will be substantially restricted. Further, it is possible that in the counterfactual the entrant may fail and exit the market. We came to the conclusion that exit, or at least severely restricted entry, is a reasonable counterfactual based on: (1) the barrier to entry that the combination of high termination rates and deep on-net discounting create given the highly concentrated structure of the New Zealand mobile market; (2) experience in Slovenia, a country in which the mobile market structure bore a number of remarkably similar characteristics to NZ and which provides a real-world example of where the barrier to entry described in point (1) forced exit; (3) the entry experience in NZ - ie, a failed attempt by TelstraClear to establish its fixed-mobile converged service, Unplugged, using its own mobile network infrastructure; and (4) the length of time it will take 2degrees to establish a place in the market.

As a result, we look at two counterfactuals – one in which the entrant is forced to exit, and another in which it remains in the market but has only a weak competitive impact.

Results of analysis

Our findings are that the 5-year NPV of the increase in consumer benefits is in the range of approximately \$0.5b to \$2.4b, and for total surplus is in the range of \$0.3b to \$1.3b. Inclusion of a terminal value to account for benefits accruing from regulation beyond 2015 results in a range of \$2.7b to \$15.3b for consumer benefits, and total surplus is in the range of \$1.6b to \$8.2b. These findings strongly reinforce the conclusion of the Commerce Commission in its Draft Report that there are sufficient net benefits to support a recommendation to the Minister that regulation of mobile termination be implemented in New Zealand.¹

¹ Commerce Commission (30 June 2009), *Draft Report on whether the mobile termination access service (incorporating mobile-to-mobile voice termination, fixed-to-mobile voice termination and short-message-service termination should become designated or specified services.*



Table 1: Increase in surplus for scenario in which voice and data prices fall by 60% in the factual (\$m)

	Counterfactual	
	2degrees exits at end of 2011	2degrees remains in market
5-yr NPV		
Consumer surplus	\$2,419	\$2,310
Total surplus	\$1,270	\$1,203
5-yr NPV + TV		
Consumer surplus	\$15,381	\$14,240
Total surplus	\$8,203	\$7,522

Table 2: Increase in surplus for the scenario in which voice and data prices fall by 30% in the factual (\$m)

	Counterfactual	
	2degrees Exits at end of 2011	2degrees remains in market
5-yr NPV		
Consumer surplus	\$568	\$466
Total surplus	\$336	\$276
5-yr NPV + TV		
Consumer surplus	\$3,761	\$2,693
Total surplus	\$2,220	\$1,612

1. INTRODUCTION

In its Draft Report², the Commission has examined the welfare effects of mobile termination regulation, in order to determine whether the benefits of regulation would outweigh the costs. In its analysis, the Commission has examined separately the effects on pricing and usage of FTM and mobile calls. In this report we focus on the latter, but also consider the effects on other mobile services – that is, SMS, MMS and mobile data.

This report is structured as follows:

- Section 2 examines the relevant factual scenarios – that is the mobile market outcomes that occur with mobile termination regulation;
- Section 3 considers outcomes in the counterfactual – that is, mobile market outcomes that occur in the absence of mobile termination regulation;
- Section 4 describes the methodology and key inputs used in calculating consumer surplus and total surplus;
- Section 5 presents the results of our analysis; and
- Section 6 contains our conclusions.

2. RELEVANT FACTUAL: MOBILE MARKET OUTCOMES WITH MOBILE TERMINATION REGULATION

The factual scenario is one in which mobile termination is regulated. Key parameters to determine when defining the factual include:

1. what regulated rates would be implemented and when
2. what the retail prices of mobile services (voice and data) will be
3. what volumes of mobile services will be purchased
4. whether there will be changes to the underlying costs of mobile networks (ie, thereby driving increases in producer surplus)

In respect of point (1), for consistency with the Commission's analysis of FTM termination, we have utilised the Commission's assumptions that regulated mobile termination rates would take effect in the factual from early 2011 and their levels would be those set out in the table below.

² Commerce Commission (30 June 2009), *Draft Report on whether the mobile termination access service (incorporating mobile-to-mobile voice termination, fixed-to-mobile voice termination and short-message-service termination should become designated or specified services.*

Table 3: Commerce Commission's mobile voice call and SMS termination estimates

	2011	2012	2013	2014	2015
Voice call termination	\$0.058	\$0.052	\$0.0470	\$0.0430	\$0.0380
SMS termination	\$0.0077	\$0.0069	\$0.0062	\$0.0056	\$0.0050

Source: Commerce Commission Draft Report

To determine reasonable estimates of retail mobile prices in the factual, we have looked to international experience of prices changes that resulted from market entry (see section 2.1). In particular, we assume that the regulation of the factual will allow 2degrees to be as an effective competitor as other entrants were overseas.

To determine the likely demand for retail mobile voice services in the factual, we have looked to international literature on mobile elasticities and have examined data on how elasticity levels differ across the demand curve (see section 2.2). The responsiveness of demand for non-voice services is considered in section 2.3).

Finally, we discuss the impact of competition on costs with reference to the literature and international evidence (see Section 2.4).

2.1. LIKELY RETAIL PRICE OUTCOMES IN THE FACTUAL

A key consideration in modelling retail prices in the factual is what effect the entry of 2degrees will have. The effect of entry on the average retail prices will depend on a number of factors. For the purposes of the current analysis, assumptions we make in the factual are that:

- termination charges implemented through regulation in the factual will allow 2degrees to overcome the barriers to entry/expansion posed by the combination of on-net discounting and above cost mobile termination rates. We note, however, that 2degrees would be a substantially more effective competitor if mobile termination rates were set on the basis of Bill and Keep (BAK) or more closely reflected long run incremental costs (LRIC)³;
- 2degrees entry will stimulate vigorous price competition between all three networks. In a market in which there are high fixed cost and low variable costs, a new entrant will have the incentive to compete aggressively in order to achieve scale. As will be discussed in more detail below, international experience shows that large price cuts have been experienced as a result of mobile network entry. However, as noted above, competition may be stimulated further with BAK or rates that are closer to LRIC.

The exact extent of the price reductions that will occur is unknown. We consider that a key means for determining reasonable scenario estimates for the factual is to look to international experience. For this, section 2.1.1 examines academic studies of mobile entry, as well as those examples of entry for which we were able to obtain price change data. Section 2.1.2

³ The LRIC of the MTAS should be distinguished from the TSLRIC cost the Commission seeks to estimate in considering international benchmark rates, as that cost includes some contribution toward network costs.

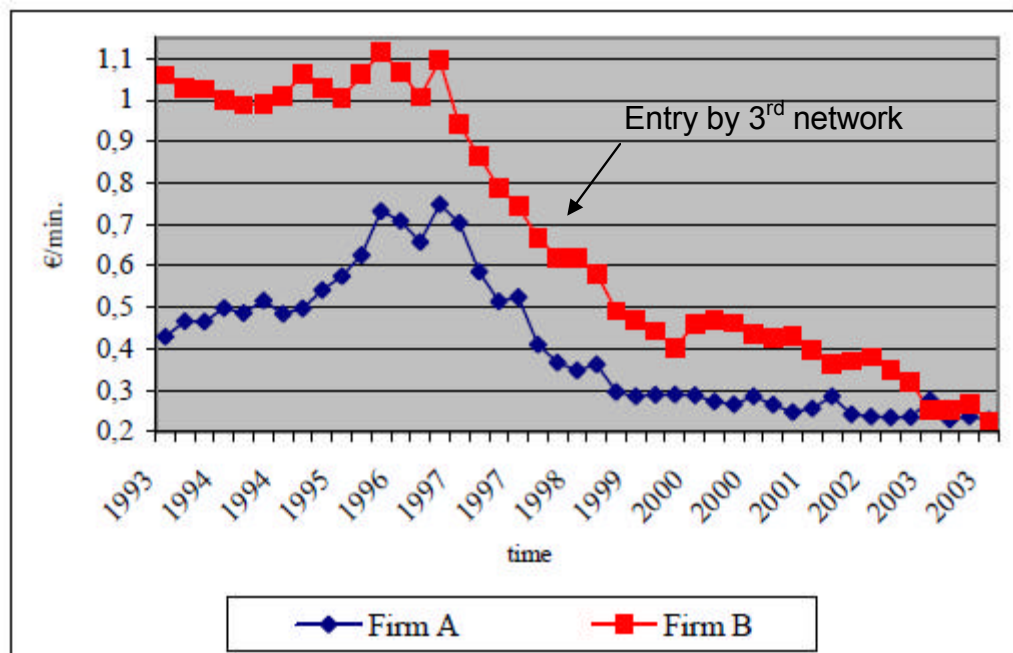
comments on this data, and section 2.1.3 provides our estimates for price changes in the factual.

2.1.1. Price falls after entry

Academic studies of mobile telecommunications find that entry has a significant impact on prices, particularly where it involves entry by a third carrier.⁴ For example, in 1998, in Portugal, a third entrant disturbed the existing duopoly and the prices of the two incumbent networks, TMN and Vodafone, fell by 57% and 63% respectively.⁵ Moreover, those price reductions were found to be due to the increased competition that the incumbent duopolists faced from the new entrant, and not technological progress or a gain in scale economies or spillovers.

The Portuguese case is of particular interest because it is an example of the relatively late entry by a third carrier (even if much earlier than in New Zealand⁶) in a relatively small economy (though Portugal's population density is substantially greater than that of New Zealand). As can be seen from Figure 1, there was a substantial decline in price in the year prior to entry (1997), as well in the years post-entry.

Figure 1: Average price per minute in Portugal



⁴ See, for example: Li, Y. (2008) "Econometric Evidence on the Impacts of Privatization, New Entry, and Independent Industry Regulator on Mobile Network Penetration and Expansion" <http://ssrn.com/abstract=1316325>. Other more theoretical studies have noted that where there are just two players in the market competition may not be effective and hence the entry of a third player will tend to significantly enhance the competitive dynamic. See: OPTA, 'Is Two Enough?', Economic Policy Note no 6, September 2006 (and references contained therein).

⁵ Abrantes-Metz, R. M. and P. Pereira (2007). "The Impact of Entry on Prices and Costs", <http://ssrn.com/abstract=1013619>.

⁶ The fixed line incumbent offered analogue mobile service since 1989, but was granted a digital license along with Vodafone in 1991. The third carrier entered over 1997.

Another example of mobile price declines occurring as a result of third player entry is Egypt, where Etisalat was granted the third mobile licence in Egypt in mid-2006, allowing it to offer both 2G and 3G services.⁷ In that year, mobile subscription charges fell by around 30% from US\$26 /month to around US\$17/month. In 2007, mobile penetration grew from 24% to 40% (18 million to 30 million subscribers) and in 2008 penetration grew further to around 54% (41 million subscribers).⁸ While we were unable to obtain data on price declines in 2007 and 2008, the initial 30% decline suggests material price declines in this period.

In many developed (and often less developed) countries it is difficult to obtain historic data on the price impacts of third player entry because entry happened many years ago (which emphasises the extent of entry barriers in New Zealand). However, we were also able to obtain data relating to fourth player mobile entry on prices in three different countries: Australia, Sweden and the UK.

In Australia, in April 2003, the launch of a fourth carrier, Hutchison '3' network was followed by a sharp decline in mobile prices and an increase in usage. On entry, Hutchison faced three well-established networks, Telstra, Optus and Vodafone, as well as Hutchison's own 2G Orange network. In 2004-2005, the ACCC's index of mobile prices fell by 13%, its largest one-year fall since financial year 1999-2000, and they fell by a further 7% in 2005-2006. However, this example was not a case of true new entry because Hutchison was already in the market – had entry occurred by an entirely independent player even larger price cuts may have occurred.

In Australia, in 1999-2000, new entry induced similar price effects and contributed to strong growth in mobile subscriptions over this period (Table 4). Two new entrants challenged Telstra, Optus and Vodafone—Hutchison's 2G Orange, and One.Tel's ultimately failed, entry. In 1999-2000, mobile charges fell by 13.2%, and in 2000-2001, by a further 7% in 2000-01. Handset prices also fell sharply following One.Tel's entry. Australian mobile subscriptions grew by around 30% in each of the years 1999, 2000 and 2001.

Table 4 Mobile subscriptions in Australia 1997-2003

Year	Subscriptions ('000)	Annual growth
1998	4,918	7.4%
1999	6,315	28.4%
2000	8,562	35.6%
2001	11,132	30.0%
2002	12,670	13.8%
2003	14,347	13.2%

Source: ITU Telecommunications Indicators Database

In Sweden, in 2003, Hutchison entered as the fourth network operator. Again there were sharp decreases in prices, particularly between 2004 and 2005. In the three years following Hutchison's entry, prices measured by the OECD's medium user basket fell by around 60%.

In the UK, '3' entered in 2003 as the fifth network operator.⁹ By the end of 2004, 3 accounted for 2.5% of mobile subscriptions and by the end of 2007 it held 4%. Between 2004 and 2007,

⁷ Wieland K, 'Etisalat Wins Egypt's Third Mobile Licence', *Telecommunications Online*, 5 July 2006

⁸ Price and penetration data from the ITU Telecommunications Indicators Database

⁹ The other network operators were Vodafone, O2 (BT Cellnet), Orange, and T-mobile (One2One).

the price per minute of UK mobile calls fell by 13% per year on average. This indicates that despite being a relatively small player, 3's entry may have had a significant price impact in the UK mobile market.

2.1.2. Comments and caveats

An important difficulty in international comparisons is the extent to which the conditions of entry in these cases are comparable to the case in New Zealand. On one hand, factors that stand against the ease of entry, and hence its ultimate impact on prices, include:

- the high level of mobile penetration in New Zealand at the time of entry, so there are few new customers to attract and most customers must be encouraged to churn from existing providers;
- the fact that Telecom, and especially Vodafone, will have learned from international experience how to effectively respond to previously-used entry strategies (for example, exploiting the network effect through on-net discounting); and
- the fact that any as yet new and hence untested entry strategies are less likely to be as effective as earlier approaches were before effective counterstrategies were developed (an example of the law of diminishing returns).

On the other hand, factors that favour effective entry include:

- the relative stagnation of the high-priced New Zealand market resulting in current customer dissatisfaction (see discussion immediately below);
- high prices and low usage of mobile, implying untapped demand.
- the potential to stimulate substitution from fixed to mobile services, as a result of high fixed line pricing¹⁰;
- lower costs today due to technological developments than compared with past examples of entry; and
- the capacity to spread costs over more services (for example, broadband).

New Zealand prices and usage levels reinforce the possibility of large price reductions

International comparisons of prices, usage and service rollout, suggest New Zealand has tended to lag the rest of the world. Historically, mobile prices in NZ have been found to compare poorly in international price comparisons. In 2008, the Commission noted that 'the main mobile plans benchmarked have not changed in price in \$NZ over the last 18 months' and that 'these plans have continued to rank in the bottom quartile of the 30 OECD countries surveyed'.¹¹ In September 2008, New Zealand was ranked 25th out of 30 OECD countries in terms of pricing for the medium user mobile basket (that is, it was the 6th most expensive in the OECD). Prices for this basket in New Zealand were nearly 150% of the OECD average price.¹²

¹⁰ See, for example, the Commerce Commission's *2008 Telecommunications Market Monitoring Report* in which it finds that pricing in New Zealand for a fixed line basket is more expensive than most other OECD countries.

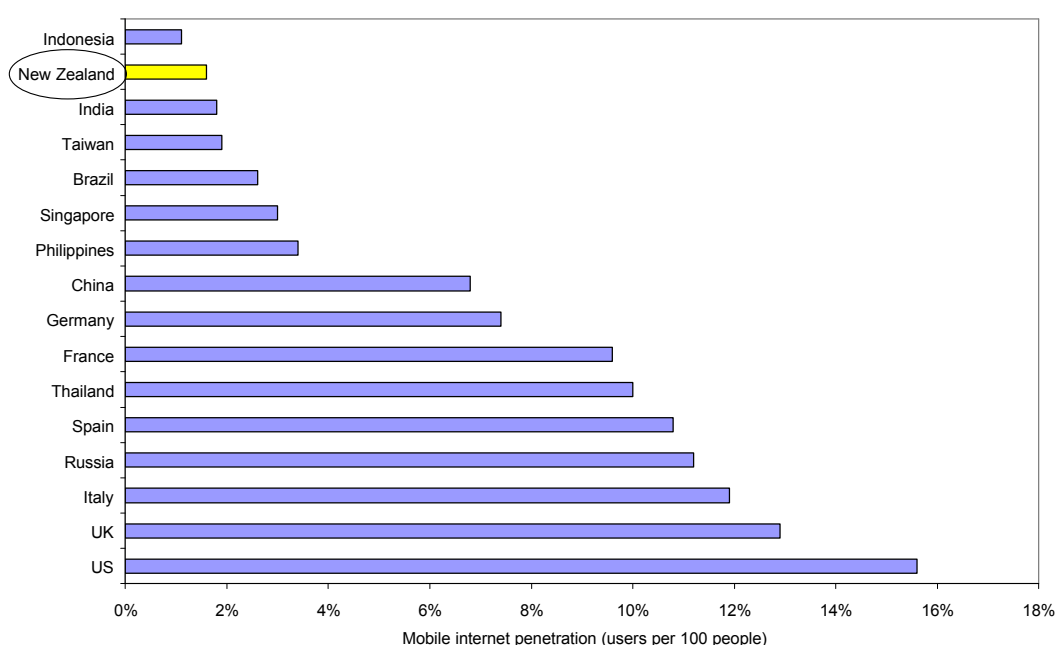
¹¹ Commerce Commission, 'Telecommunications Key Statistics – September Quarter 2008', p7

¹² Commerce Commission, 'Telecommunications Key Statistics – September Quarter 2008', p8

Perhaps as a result of these relatively high prices, New Zealand mobile usage per subscriber (minutes of usage per subscriber per month) is low by international standards. [TRI, VRI.] In Australia average usage is around 107 minutes per subscriber per month¹³, while in the UK it is around 111 minutes per subscriber per month.¹⁴

Mobile internet use in New Zealand also appears to be very low by international standards. As Figure 2 indicates, New Zealand's mobile internet penetration rate of 1.6% was the second lowest in a sample of 16 developed and developing countries surveyed by Nielsen Mobile in July 2008.¹⁵ In some European countries such as Spain and Austria, mobile broadband penetration is now well over 20%.¹⁶

Figure 2 Mobile internet penetration in surveyed countries



Data source: Nielsen Mobile, *Critical Mass: The Worldwide State of the Mobile Web*, July 2008

Innovation and product development has also been sluggish in the New Zealand mobile market. Telecom and Vodafone had not completed full 3G technology deployments until very recently (arguably prompted by the prospect of 2degrees' entry), while many other countries have had 3G networks for over 5 years. In countries such as Australia, the UK and the United

¹³ In Australia in 2007-08 there were 22.1 million mobile subscribers and ACMA estimated that usage (voice minutes) was around 48% higher than two years ago (ACCC, *Telecommunications Competitive Safeguards for 2007-08*, April 2009, pp24-25). In 2005-06, there were 19.1 billion mobile voice minutes recorded (ACCC, *Telecommunications Market Indicator Report 2005-06*, August 2007, p14). This implies usage in 2007-08 of around 28.3 billion minutes, or 107 minutes per subscriber, per month on average.

¹⁴ In 2007, Ofcom reported 99 billion mobile voice minutes and 74 million mobile subscribers (Ofcom, *The Communications Market 2008*, p294)

¹⁵ Nielsen Mobile, *Critical Mass: The Worldwide State of the Mobile Web*, July 2008

¹⁶ European Commission, *Progress Report on the Single European Electronic Communications Market 2008 (14th Report)*, Brussels, March 2009, Annex 2, p116

States, 3G networks were rolled out as early as 2003.¹⁷ Even in less developed countries such as Egypt, 3G networks have been available for some time.¹⁸

2.1.3. Conclusions on reasonable assumption for price reductions resulting from entry

Voice pricing

In our view, Abrantes-Metz and Pereira (2007), because it based 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%. The other examples suggest ranges from as low as 21% over three years (Australia), rising to nearly 40% in the UK example and to 60% in the case of Sweden. Given that the latter three of these four examples were of entry by a fourth or later carrier, and given the high levels of prices in New Zealand presently, the international evidence is consistent with our view that in New Zealand price declines of close to 60% are a plausible factual scenario. As a sensitivity test, we consider a second counterfactual in which price falls by 30%, although higher price reductions are in our view more likely. We refer to the factual scenario in which a 60% price reduction occurs as "Factual A" and the alternative factual scenario in which competition stimulates only a 30% reduction as "Factual B".

In modelling the mobile price reductions, we assume that the price declines do not immediately follow entry for two reasons:

- first, international evidence shows that significant price declines occur over the first 2-3 years following entry. That the total price effect occurs over a period of time may reflect the entrant establishing its brand, consumers learning about the service, a waiting period for consumers who would like to switch but are constrained by contracts at the time the new network enters etc.
- second, in the NZ context the ability of the entrant to offer price cuts will be in part dependent on mobile termination rates which are assumed not to fall until 2011.

To develop a factual price profile, we assume that the largest impacts of entry do not occur until 2011 when regulation of termination charges is implemented. This is because: (1) prior to that point the entrant is not able to offer significant discounts off the weighted average on-net-off-net price due to the height of the termination charge; and (2) the percentage of the market that is contestable by 2degrees would also be limited. This is because (as will be explained in more detail in section 3.1), the network effects created by on-net pricing restrict the pool of customers who would be willing to switch.

In Factual A, we model a price that reduces by 60% (calculated using the base of the 2008 average revenue per minute) over 5 years. The largest price reduction occurs in 2011 when fully fledged competition begins and then reduces during the following two years. After 2014, we assume that annual price reductions flatten out at 6% - a level that seems reflective of annual price declines internationally.

¹⁷ In the UK and Australia Hutchison launched 3G networks in early 2003, while in the US Verizon Wireless launched a 3G network in October 2003.

¹⁸ Etisalat has offered 3G services in Egypt since early 2007 (<http://www.telecomsinsight.com/file/45074/etisalat-aims-for-30-of-egyptian-market.html>)



Factual B is based on a more modest price reduction of 30%. Given that it is smaller, we model it over 4 years, as opposed to the 5 year period in Factual A. We assume that the largest annual price reduction of 15% occurs in 2011, followed by a 10% price reduction in 2012. After that we assume ongoing reductions of 6%.

In both factualls we assume an annual reduction of 10% in 2009 and 2010 reflecting the fact that even though 2degrees isn't able to compete as aggressively nor can it effectively target as many customers as it will be able to from 2011 onwards, it will still be having some effect on the market.

Table 5: Factual assumptions – annual price reductions

	2009	2010	2011	2012	2013	2014	2015
Factual A	10%	10%	30%	25%	15%	6%	6%
Factual B	10%	10%	15%	10%	6%	6%	6%

In the model we calculate an average revenue per billed minute¹⁹ for 2008 and apply to it the market price reductions set out above to determine estimates of the revenue per minute for each of the two factual scenarios for each year modelled. Our model is in calendar years (we have implemented it that way for consistency with the Commission's FTM model), but the Confidential data provided by Telecom and Vodafone are for financial years 2005/6, 2006/7 and 2007/8. We estimated the 2008 average revenue by assuming it was 8.5% lower than the 2007/8 revenue per minute. [TRI,VRI] The resulting revenue per minutes used in the two factual scenarios are contained below in Table 6.

Table 6: Factual assumptions – prices for voice [TRI,VRI]

	2008	2009	2010	2011	2012	2013	2014	2015
Factual A								
Factual B								

SMS, MMS and data service pricing

For SMS, MMS and data services, we assumed the same percentage price reductions as we did for voice (ie, the assumptions contained in Table 5). This seems appropriate in light of international price comparisons (noted by the Commission) which show NZ prices are relatively expensive.²⁰

Mobile broadband prices in New Zealand are also high by international standards. A survey of mobile broadband pricing in 24 countries shows New Zealand prices to be among the highest. In Figure 3 below, prices for a bundle of mobile broadband access, data (around 3GB per month) and a device (typically a USB modem) are compared across a range of European, North American and Australasian countries. Comparable plans with similar data allowances and speeds are chosen where possible and monthly prices are converted to US dollars and adjusted for comparative price levels using Purchasing Power Parities. The plans chosen are from major operators in each country and (where possible) cross-country operators such as Vodafone are chosen for consistency. Where operators charge for a

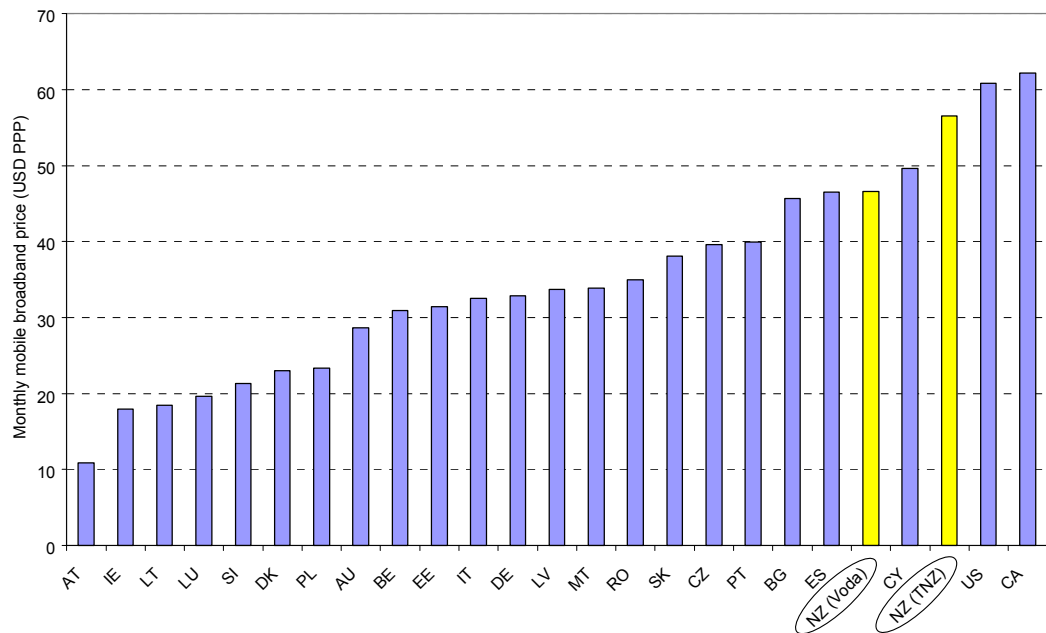
¹⁹ We did not have access to actual minutes because they were classified as Commission Only Information. We note that the revenue per actual minute of use would be higher than the average revenue per billed (ie, rounded) minute.

²⁰ Commerce Commission, 'Telecommunications Key Statistics – September Quarter 2008', p7-8



device such as a USB modem, this cost is spread evenly over a 24 month period, the typical life of a broadband contract.

Figure 3 Mobile broadband pricing in selected countries



Data source: operator websites accessed 21 July 2009; OECD; Eurostat; Oanda; Concept Economics calculations

The resulting prices for SMS, MMS and Data after applying the reductions set out in Table 5 are contained in the table below.

Table 7: Prices for SMS, MMS and Data [TRI, VRI]

	2008	2009	2010	2011	2012	2013	2014	2015
Factual A								
SMS								
MMS								
Data (per MB)								
Factual B								
SMS								
MMS								
Data (per MB)								

2.2. LEVEL OF VOICE DEMAND IN THE FACTUAL

To estimate the likely level of demand for mobile voice services in the factual, we estimated the likely responsiveness of demand to price falls, that is, the own-price market demand elasticity in the NZ market due to entry and applied these demand elasticity estimates to the price changes determined above in section 2.1. We derived our estimates by reviewing empirical estimates of mobile own-price elasticities from the economic literature (see section

2.2.1 below); the demand response to price reductions following entry internationally (section 2.2.2); and the demand response to price reductions in New Zealand in recent years (section 2.2.3).

While these observations were made at different times, were largely drawn from cases outside of New Zealand and were not always associated with entry, they provide some indication of the range of plausible demand responses to price reductions that can be expected in the New Zealand market looking-forward. Moreover, to the extent that they were not associated with entry, they are likely to underestimate consumers' responses, as entry increases competition for custom across the board, rather than merely through price competition. Further, as the latter part of section 2.1.2 above illustrated, it is likely that additional competition in New Zealand has already, and will continue to induce greater innovation than would otherwise be observed. Section 2.2.4 summarises our voice demand elasticity assumptions in the factual.

2.2.1. Mobile demand elasticity estimates from the academic literature

We were able to identify six academic studies that looked at mobile usage price elasticities. These studies (listed in Table 8) have generally estimated elasticities of around -0.5 to -0.8.

Dewenter and Haucap (2007) estimate elasticities for postpaid and prepaid subscribers using subscription and traffic data for various tariff plans in Austria.²¹ The authors find that demand for usage (that is, minutes) is more responsive for post- rather than pre-paid subscribers, which may be related to the fact that the total monthly bill of post-paid customers tends to be higher than for pre-paid.

In the UK, elasticities of -0.5 to -0.6 have been calculated by DotEcon and Holden Pearmain.²² These UK studies estimated the elasticity of mobile usage with respect to the variable usage tariff (that is, ignoring subscription costs). Hausman (1999) estimated the elasticity of a composite of subscription and usage for the United States in the early years of its second generation (that is, digital) mobile phone adoption.²³ Tischler, Venture and Walters estimate the elasticity in Israel to be -0.8. This Israeli study was calculated around the time of entry by the third operator.

²¹ Ralf Dewenter and Justus Haucap, *Demand Elasticities for Mobile Telecommunications in Austria*, Ruhr Economic Paper #17, 2008.

²² DotEcon's study was commissioned by O2 and Holden Pearmain's by Vodafone. A description of both studies is provided in UK Competition Commission (2003), *Vodafone, O2, Orange and T-Mobile: Reports on references under section 13 of the Telecommunications Act 1984 on the charges made by Vodafone, O2, Orange and T-Mobile for terminating calls from fixed and mobile networks*, London, February 2003.

²³ Hausman J, 'Cellular telephone, new products and the CPI', *Journal of Business and Economic Statistics*, vol 17, no 2 (April 1999), pp188-194.

Table 8 Estimates of mobile traffic demand elasticity from the literature

Study	Country	Estimate
Dewenter and Haucap	Austria	-0.67 for postpaid ²⁴
DotEcon	UK	-0.62
Holden Pearmain Customer Survey	UK	-0.48
Tischler, Ventura and Walters ²⁵	Israel	-0.80
Hausman	US	-0.55

2.2.2. Case studies of demand response after entry

Another important indicator of the likely demand response to entry-induced price reductions is the history of demand responses where new mobile entry has occurred. Clearly demand responses will differ by country depending on various country-specific market dynamics. Nonetheless, a review of the international experience provides an indicative range of possible demand responses following market entry. In this section we review the experience in the three countries for which we had price and quantity data when mobile entry occurred – Australia, Sweden and the UK.

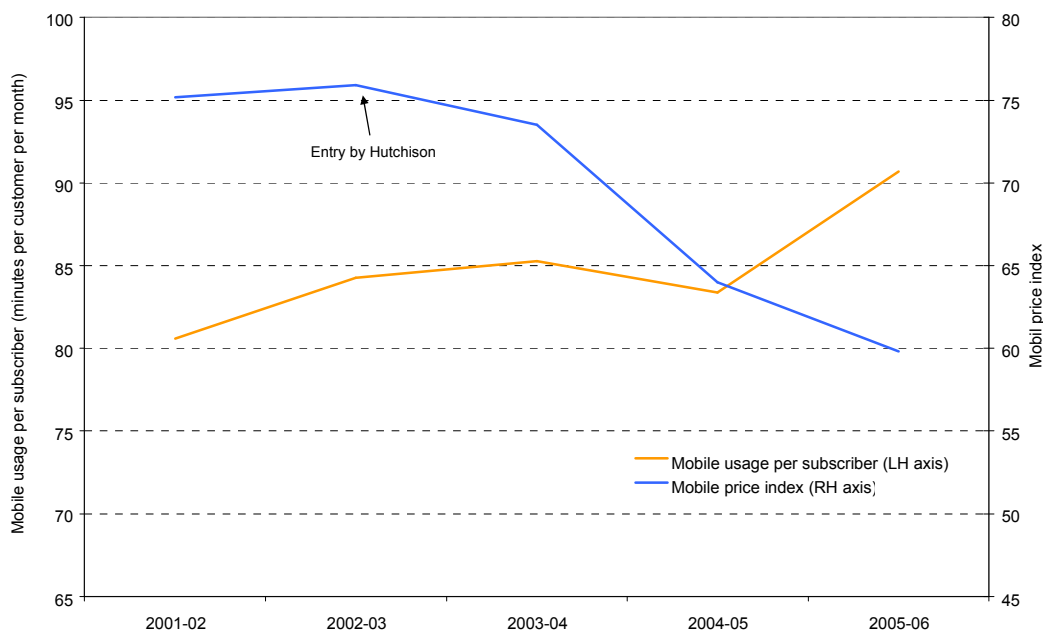
In Australia, Hutchison entered the market in 2003 as the fourth mobile operator (the other three being Telstra, Optus and Vodafone). In 2004-2005, following Hutchison's entry, the ACCC's index of mobile prices fell by 13%, its largest one-year fall since financial year 1999-2000. Prices fell by a further 7% in 2005-2006. Over the same two years, mobile usage per subscriber increased by around 9% as both subscriptions and usage grew strongly (Chart 1). This suggests, over the three-year period following Hutchison's entry, a price elasticity response given entry of around -0.3.²⁶

²⁴ Dewenter and Haucap were unable to find a statistically significant demand for prepaid services, which they put down to the unreliability of prepaid subscriber data and the fact that some customers only use their prepaid connection to receive calls.

²⁵ Tischler A, Ventura R and Walters J, 'Cellular telephones in the Israeli market: the demand, the choice of provider and potential revenues', *Applied Economics*, vol 33 (2001), pp1479-1492.

²⁶ This elasticity is calculated by dividing the percentage change in usage (per subscriber) over the three years following entry by the percentage change in price over the same period. A similar calculation is made below for Sweden and the U.K.

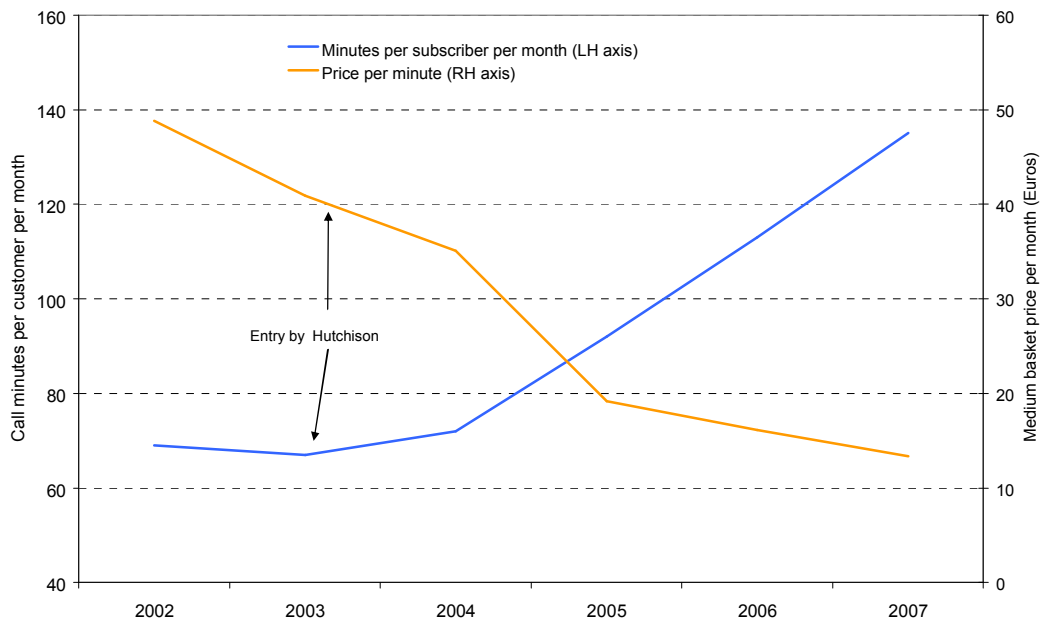
Chart 1 Price and volume impacts of mobile entry in Australia



Data source: ACCC, Market Indicator Reports; ACMA, Communications Report 2007

In Sweden, in 2003, Hutchison entered as the fourth network operator. Again there were sharp decreases in prices and increases in mobile usage, particularly between 2004 and 2005. In the three years following Hutchison’s entry, prices measured by the OECD’s medium user basket fell by around 60%, while mobile usage (minutes of calling per subscriber) increased by around 70% (Chart 2). This amounts to a price elasticity response given entry of around -1.1%.

Chart 2 Price and volume impacts of mobile entry in Sweden



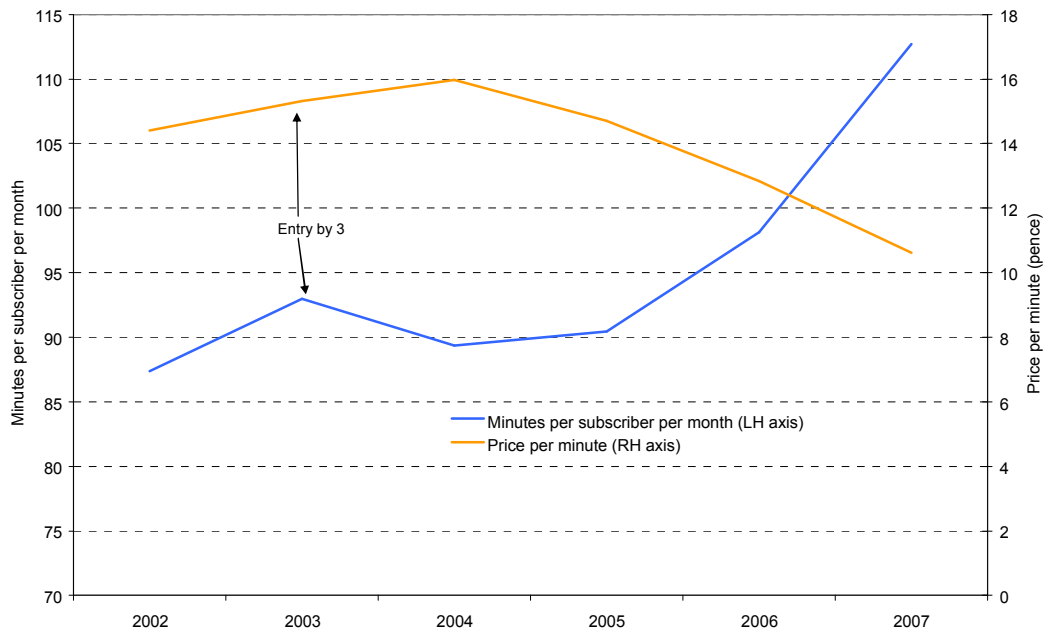
Data source: PTS, 'The Swedish Telecommunications Market'; EC Implementation Reports

In the UK, '3' entered in 2003 as the fifth network operator.²⁷ By the end of 2004, 3 accounted for 2.5% of mobile subscriptions and by the end of 2007 it held 4%. Despite being a relatively small player, 3's entry appears to have had significant price and volume impacts in the UK mobile market. Between 2004 and 2007, the price per minute of UK mobile calls fell by 13% per year on average, and the volume of mobile calls per subscriber grew by 8% per year on average (Chart 3). In the 3 years following entry, the elasticity of demand for mobile services with respect to price was around -0.7.

²⁷ The other network operators were Vodafone, O2 (BT Cellnet), Orange, and T-mobile (One2One).



Chart 3 Price and volume impacts of mobile entry in the UK



Data source: Ofcom, 'The Communications Market'

The preceding examples from Australia, Sweden and the UK suggest that new entry tends to produce significant price reductions and output increases with a price elasticity given entry of between -0.3 and -1.1. Further, while these are relatively crude before and after comparisons – they do not take account of any effects that may have occurred independent of entry – they are conducted over relatively narrow time frames and this would minimise the effects of variables that change slowly, such as rising incomes, or infrequently, such as significant regulatory change.

The observed -0.3 to -1.1 responsiveness range probably also understates how volumes in New Zealand would expand due to price declines caused by 2degrees' entry because Australia, Sweden, and the UK each already had three or more incumbent carriers prior to the entry analysed above. Given third carrier entry tends to have the maximal effect,²⁸ it is reasonable to expect that in New Zealand both price reductions and the quantity response would be higher than in the cases examined. That suggests the relevant price elasticity given entry would be more responsive than the -0.3 Australian elasticity and could even be more responsive than the -1.1 Swedish elasticity.

2.2.3. Demand elasticity in NZ in recent years

[TRI,VRI:]

2.2.4. Resulting estimates of voice demand in factual

To summarise, the academic estimates of the own-price demand elasticity for voice services, which likely underestimate the impact of demand responsiveness in the presence of an

²⁸ See footnotes 4 and 5 above and associated text.

entrant, give a range of -0.5 to -0.8. At the same time, the less sophisticated estimates provided by looking price and volume changes post-entry conservatively (since the examples are of a fourth or fifth entrant) suggest a range from -0.3 to -1.1. In this light, we have conservatively assumed demand elasticities due to entry in the range of -0.6 (which is slightly higher than the lowest academic estimate) to -1.1 (which is higher than the highest academic estimate, but equal to what happened in Sweden). The resulting estimates of mobile voice minutes in the factual are set out in the table below. [TRI,VRI]

Table 9: Volume of mobile market outgoing minutes in factual (millions) [TRI,VRI]

	2008	2009	2010	2011	2012	2013	2014	2015
Elasticity	-1.1	-1.01	-0.93	-0.85	-0.78	-0.71	-0.65	-0.6
Factual A								
Factual B								

2.3. LEVEL OF DEMAND FOR OTHER SERVICES IN THE FACTUAL

The elasticity of demand for SMS, MMS and mobile broadband has not been studied in as much detail as the elasticity of demand for voice services. Nonetheless, there are a few relatively recent studies from which we can draw reasonable estimates of these elasticities.

A recent study conducted in Portugal estimated the price elasticity of demand for SMS to be -0.28, significantly lower than the corresponding elasticity for voice services.²⁹ Another recent study by Kim et al (2009) also finds SMS demand to be inelastic, estimating elasticity around -0.1.³⁰ On the basis of this information we use the midpoint of this range – ie, 0.19. [TRI,VRI]

We are not aware of any studies of MMS elasticity to date, and hence conservatively assume that MMS elasticity is similar to SMS elasticity.

Demand for mobile broadband services has been found to be much more elastic than that for voice. A recent study conducted in Austria estimates the elasticity of demand for DSL, cable and mobile broadband services and estimates mobile demand to have an elasticity of -2.57.³¹ This relatively high elasticity is attributable to the presence of close substitutes to mobile broadband such as DSL, cable and other fixed broadband technologies. This is supported by an earlier study from Finland which finds mobile broadband demand to be similarly elastic.³² We assume in this analysis an elasticity of -2.5 in 2008, falling to -1.5 by 2015.

2.4. IMPACT OF TERMINATION REGULATION ON COSTS

A priori reasoning suggests that increased competition will not induce existing players to reduce their costs, on the assumption that if firms are profit-maximising they would have already minimised costs. However, empirical evidence indicates that entry by a new network could potentially induce existing networks to reduce their costs.

²⁹ Grzybowski L and Pereira P, 'The Complementarity between Calls and Messages in Mobile Telephony' *Information Economics and Policy*, vol. 20(3), September 2008, pp 279-287

³⁰ Kim Y, Telang R, Vogt W B and Krishnan R, 'Empirical Analysis of Mobile Voice and SMS Service: A Structural Model', Working Paper, April 1, 2009 (available at SSRN: <http://ssrn.com/abstract=1085285>)

³¹ Cardona M, Schwarz A, Yurtoglu B and Zulehner C, 'Demand estimation and market definition for broadband internet services', July 2007

³² Gao M, Hyttinen A and Toivanen O, 'Demand for Mobile Internet: Evidence from a Real-world Pricing Experiment', HECER Discussion Paper no 43, January 2005

In the specific context of mobile termination, Abrantes-Metz and Pereira (2007, 6) found that the entry of a third mobile network in Portugal led the incumbent duopolists to reduce costs by over 60% (the entrant's median cost was found to be slight above that of Vodafone's). In an earlier study of the same episode, Gagnepain and Pereira (2005, 15) find competition reduced industry costs by over 25% *in a single year*.³³ Therefore, it may well be the case in NZ that third player entry will lead to reduced costs on the part of Telecom and Vodafone.

For the sake of being conservative, we make the assumption in this analysis that the costs of Vodafone and Telecom will not reduce as a result of increased competition but this likely understates the producer surplus of our total surplus calculations.

3. DETERMINING THE COUNTERFACTUALS: WHAT WOULD HAPPEN TO MOBILE MARKET OUTCOMES WITHOUT MOBILE TERMINATION REGULATION

To determine the likely outcomes without regulation first involves identifying the likely mobile termination rates that would prevail. Consistent with the Commission's approach to its FTM CBA, we assume that the rates in the Telecom and Vodafone interconnection agreements would apply.

In our view, a key consideration in determining the counterfactual is the extent to which the level of the mobile termination rates will affect the ability of the entrant to viably compete. As has been acknowledged by the Commission³⁴, and explained in prior submissions made by 2degrees and Concept Economics³⁵, heavy on-net discounting in combination with high mobile termination charges can create a barrier to sustained entry and expansion. More specifically there are two related effects: (1) the network effects created by heavy on-net discounting; and (2) high termination charges reducing/removing the ability of the entrant to lure customer away from established network

Network effects of heavy on-net discounting

The heavy on-net discounting by the incumbents has led to a situation where in some segments of the market there is almost complete domination of calling communities by a single network. In these circumstances it is very difficult for an entrant to acquire a customer base because if a customer churns to the entrant, that customer knows that their contacts (eg, friends and customers) will be charged high off-net prices to call them, and similarly that they will have to pay high fees to reach those contacts, and this will reduce the propensity of the customer to switch in the first place.

2degrees has provided examples to the Commission in the form of market research results of how entire calling communities are virtually all connected to a single mobile network. We note that although the research commissioned by 2degrees focussed on school and university students, these network effects are likely to occur more generally throughout residential customers and businesses, even if to a lesser extent than for student

³³ Gagnepain, P. and P. Pereira (2005). "Entry, cost reduction and competition in the Portuguese mobile telephone industry", CEPR Discussion Paper No. 4993, April 2005.

³⁴ See, for example, p. 84 of the Commerce Commission's Draft Report.

³⁵ See Concept Economics (September 2008), *Assessing the effects of M2M termination regulation on mobile entry and economic efficiency*.

communities. For example, small businesses/tradespeople may well give consideration to what network their customers are likely to be connected to when making their own decision on network choice. There is also an effect for larger businesses, because they often have: (a) discounts which are dependent on purchasing a bundle of fixed and mobile services; and (b) mobile deals whereby all calls between staff mobiles are free. It is likely very difficult for 2degrees to contest such customers as it does not provide fixed services, and given this, even if such a customer found that 2degrees provided better coverage at certain sites or employee residences, it may be unwilling to use 2degrees' services for even those individual subscribers because calls to and from them would be off-net and hence cost more. This would make it even more difficult than it already is (eg, given fixed-mobile bundling, existing term contracts, need for strong reputation, customer account management etc) for 2degrees to break into the corporate/large business market

We note that Telecom has now implemented flat rate pricing on the XT network. While this may alleviate the network effects problem to some degree, it does not remove it. Telecom still offers capped on-net calling to designated on-net numbers, as well as the types of business calling plans mentioned above. Also, existing customers on the CDMA network still receive the on-net discounts that they had access to prior to the XT network launch. Further, Vodafone (which continues to offer extensive on-net discounting to all customers) likely has a larger share of the residential market which is important because it is the residential market that an entrant would be expected to target first.³⁶

High termination charges prevent entrant from offering attractive packages

Given the circumstances described above, when a customer switches away from incumbent to the entrant, contacts who call that customer will face high off-net calling and SMS charges. It can therefore be expected that there will be a traffic imbalance – that is, that the customer will have more outbound than inbound traffic. That imbalance will create net outpayments, with the effect that in the counterfactual where mobile termination prices are well above cost, the entrant is in effect paying a subsidy to incumbent networks. This subsidy in itself creates a hinderance to entry.

Net out payments would be further increased to the extent to which an entrant offered, as competitiveness might necessitate, its customers equivalent calling packages to those the incumbents provide via on-net discounts. To be able to offer discounts to the same range of customers, the entrant, having fewer on on-net customers, would likely have to discount some off-net calls. Thus, their customers will call off-net relatively more often than customers of the incumbents. However, the size of the outpayments can also mean that the entrant is simply unable to viably offer customers a pricing package that will lure them away from the incumbent networks.

This effect is also particularly acute for SMS, where retail pricing packages provide prices that are well below the Undertakings rates – for example, Vodafone provides 2000 on-net texts for \$10 (incl GST). Market research conducted by Phoenix shows that average usage on SMS bundle plans is 28 messages per day – ie, approximately 852 per month. If

³⁶ Reasons why this is likely to be the case include: (1) the residential market contains a large proportion of prepaid customers and so are not tied into term contracts; (2) in comparison to business customers, residential customers would generally be driven more by price and less by reputation/quality, so they would be more likely to try new entrant than a large business would; (3) fixed/mobile bundling does not appear to be so prevalent for residential customers as it is for business customers.

2Degrees were to attempt to lure customers by offering a package where it charged \$10 for 2000 on- or off- net calls, then if, for example, it had 30% of traffic on-net and 70% off-net, it would be paying around \$39 per customer in termination payments (making the simple assumption that off-net traffic was equally split between Telecom and Vodafone and applying the Undertaking rates of 3.5c for Telecom and 9.5c for Vodafone). That is, it would be making a loss on SMS traffic from those customers of around \$30 per month.³⁷

[TRI, VRI]

Defining the counterfactuals

Given the above context, it is reasonable to assume that in the absence of mobile termination regulation, one counterfactual is the scenario in which the firm is unable to viably operate in the absence of regulation and after a period exits the market. There is both local and international precedent which shows that this is a very real possibility.

Firstly, the failure of TelstraClear to launch in 2007 suggests that in the absence of termination regulation, incumbent operators may be able to obstruct new entrants. TelstraClear was due to launch its pilot wireless network 'Unplugged' in Tauranga in mid-2007, however it abandoned these plans in April of that year, citing a failure to come to a commercial agreement with Vodafone on roaming.³⁸ At the time, TelstraClear indicated that a last minute change in strategy by Vodafone had made entry 'unattractive and uncompetitive' – in short, Vodafone had erected strategic barriers to market entry.

Secondly, 2degrees has experienced numerous access and regulatory hurdles contributing to the long delay between the initial spectrum acquisition and entry.

Thirdly, the experience of Western Wireless in Slovenia illustrates how the coupling of high termination rates with deep on-net discounting can lead to foreclosure.³⁹ The case study below provides a detailed description of entry developments in the Slovenian mobile market and clearly shows the impact the absence of regulation of mobile termination (and national roaming) can have on entry.

Given the above, we have considered in this analysis a counterfactual in which the entrant exits if regulation of mobile termination is not implemented. However, we have also included a second counterfactual in which the firm continues to operate but is only able to target a limited proportion of the customer base.

³⁷ While inbound termination revenues would offset some of that loss, the large traffic imbalance that would be expected means that a loss will still be incurred.

³⁸ TelstraClear, *TelstraClear to shut down pilot wireless network in Tauranga*, Media Release, 16 April 2007

³⁹ For discussion of the prevalence on on-net discounting and its impact on the inability of the entrant, Vega, to acquire customers, see Nevenka Hrovatin, Damir Cibic & Matej Švigelj (2004), "Liberalisation and (de)Regulation of Slovenian Telecommunications Markets", *Communications & Strategies*, no. 56, 4th quarter 2004, pp. 151-178.

International case study: Slovenia

In 2001, a third mobile network entered the Slovenian market. Three features of the Slovenian market bore striking resemblance to the current NZ situation. Firstly, mobile termination rates were unregulated. Secondly, substantial on-net price discount price strategies were employed by the incumbent duopolists, Telecom Slovenia and Vodafone.

As a consequence, the third entrant, Vega, faced substantial problems acquiring customers. Hrovatin, Cibic & Švigelj (2004) explain that:

In December 2001 the third operator, Vega, entered the market, which in spite of its low on-net call prices and large scale promotion, did not manage to win a significant market share.

By 2003 it had only acquired 2.2% of the market (40,000 subscribers). Hrovatin, Cibic & Švigelj (2004) concluded that on-net discounting of the incumbent networks was a key contributing factor to the heavily concentrated nature of the Slovenian mobile market.

Eventually, in June 2006 after 5 years of operations Vega exited the market, selling its network infrastructure to the incumbent duopolists.

In 2007, the regulator cut the mobile termination rates of the two incumbents by 50%. Tusbomobil (which had purchased Vega's license) entered mid-2007, and was exempt from regulation of its termination charge. Tusbomobil has had considerably more success than Vega, and within 1.5 years of launching its network it had achieved a 3.4% share of subscribers (European Commission *14th Report on the Implementation of the Telecommunications Regulatory Package – 2008*, Slovenia Country Chapter). It seems highly likely that the change in the regulation of mobile termination played a key role in the difference between the experience of Vega and Tusbomobil. The European Commission has suggested that the introduction of regulated national roaming access in October 2007 also contributed to the success of Tusbomobil. While this may be true, Vega did have a national roaming agreement in place and did not mention the terms of that agreement in its reasons for failure. That is, the key obstacles to its success were the retail pricing strategies of the incumbents and mobile termination rates.

3.1. COUNTERFACTUAL 1: FAILED FIRM

In this counterfactual, we make the assumption that the entrant continues operating for a period after the decision to abstain from regulation is made by the Minister and then exits at the end of 2011. We assume that in each of the three years of operation the annual price reduction that occurs is 10%, and that post-exit this falls to 5% per annum (slightly less than the 6% ongoing price reductions that occur in the factual). This is conservative in that it assumes that prices are sticky – that is, despite the exit of 2degrees the incumbent duopolists do not increase their rates to pre-entry levels.

Table 10: Counterfactual 1 – annual price reduction

	2009	2010	2011	2012	2013	2014	2015
Counterfactual 1	10%	10%	10%	5%	5%	5%	5%

3.2. COUNTERFACTUAL 2: LIMITED SCALE OF OPERATIONS

In the second counterfactual, the entrant is assumed to remain in the market. We assume a 10% annual price reductions for the first three years of entry (ie, the same as for Counterfactual 1), and that in latter years the ongoing price reduction is 6% - ie, slightly higher than what would occur if the 2degrees exits and the same as the ongoing price reductions that would occur in the Factual (a conservative assumption).

Table 11: Counterfactual 2

	2009	2010	2011	2012	2013	2014	2015
Counterfactual 2	10%	10%	10%	6%	6%	6%	6%

We note that Vodafone has claimed publicly that it has experienced year-on-year reductions in average price of 18%, and that it may argue that even without regulation this type of trend would continue. We would disagree. It is our view that these price reductions were in anticipation of entry by 2degrees as well as the roll-out of the Telecom XT network and cannot be used a predictor of future reductions in the counterfactual. **[TRI,VRI]** The pre-entry price cuts in New Zealand are consistent with the general trends depicted in Figure 1 which showed that in Portugal there were large price cuts in the one and a half years prior to entry, as well as further substantial price cuts in the years following entry, and then a flattening out of prices.

4. COMPUTING THE SURPLUS EFFECTS OF MTM TERMINATION REGULATION

Consistent with the approach taken by the Commission in its FTM calculation, we have computed both consumer surplus and total surplus. The way in which we have carried out these calculations is largely consistent with the Commission's approach, in particular in that we have:

- used the 5 year timeframe of 2011 to 2015;
- we have calculated the NPV over the period using the 6% discount rate adopted by the Commission in its NPV calculation;
- the NPV results are expressed in 2011 terms so that the figures can be used in conjunction with the Commission's FTM surplus results.

In relation to the timeframe, we consider that it is necessary to take into account the benefits beyond 2015 that result from the increased regulation that mobile termination regulation will aid. Given this, we calculate a Terminal Value that assumes a 2% growth rate, in line with the RBNZ inflation target. The Terminal Value is the present value of all future benefits beyond the point at which they become stable (in this case beyond 2015).⁴⁰

When calculating the producer surplus, we make the following assumptions regarding the long run marginal cost (LRMC):

- voice traffic:

⁴⁰ The Terminal Value is calculated by summing the annual cash flows (CF) in years (n) beyond which they attain a stable growth path (g), then taking the present value (discount rate d), using the formula: $TV = (CF / (d - g)) / (1 + d)^n$

- we assume that the costs of call origination and termination are 1.24c per end-use minute (derived from the traffic-sensitive network components contained in the WIK Australian model⁴¹);
- off-net termination for the counterfactuals are as set out in Table 3;
- fixed termination is set at 1c per minute; and
- the split between on-net M2M minutes, off-net M2M minutes and F2M minutes is calculated from the Telecom and Vodafone 2007/08 data;
- for SMS traffic we use an on-net cost of 0.1 c per message⁴²,
- for MMS we use a cost of 0.032c (derived from the MMS costs of 5 Australian cents per minute and dimensioning of 187.5 messages per voice minute contained in the WIK-Consult Australian model⁴³)
- for data traffic, we assume a LRIC of 0.5c per MB. We obtained this by look to the UK where customers can buy 15Gb per month for 15 pounds per month on a 24 month contract with a free modem (see three.co.uk website). If we assume that the average user only uses half the 'free' data and strip out VAT tax, this implies a 0.17 pence per Mb or 0.42 NZ cents per Mb. We use this price as a conservative proxy for cost.

5. RESULTS OF MOBILE TERMINATION SURPLUS CALCULATION

The following tables set out the regulating estimates of the consumer and total surplus calculations. Given the goals of the Commerce Act, the consumer surplus estimates are more relevant than those for total surplus. The 5-year NPV of the consumer surplus is in the range of approximately \$0.5b to \$2.4b, and total surplus is in the range of \$0.3b to \$1.3. Inclusion of a terminal value to account for benefits accruing from regulation beyond 2015 results in a range of \$2.7.b to \$15.4b, and total surplus is in the range of \$1.6b to \$8.2b.

⁴¹ See the 2degrees submission for details of how this cost was derived.

⁴² Based on the comments in WIK-Consult (June 2009) *Review of Submissions by Operators and Reports by Consultants relating to the NZ Commerce Commission's MTAS Investigation*, p.7.

⁴³ WIK-Consult, *Mobile Termination Cost Model for Australia*.

Table 12: Consumer surplus estimates – 5-year NPV (2011-2015) \$m

	Voice	SMS	MMS	Data	Total
Factual A					
Counterfactual A1					
Allocative efficiency gain	\$261.2	\$16.9	\$0.2	\$106.8	\$385.1
Transfer of excess returns	\$1,404.3	\$399.3	\$5.0	\$224.9	\$2,033.6
Total increase in CS	\$1,665.5	\$416.2	\$5.3	\$331.8	\$2,418.7
Counterfactual A2					
Allocative efficiency gain	\$236.7	\$15.3	\$0.2	\$96.8	\$349.0
Transfer of excess returns	\$1,354.0	\$381.2	\$4.8	\$220.9	\$1,960.9
Total increase in CS	\$1,590.7	\$396.5	\$5.0	\$317.7	\$2,309.9
Factual B					
Counterfactual B1					
Allocative efficiency gain	\$15.6	\$1.1	\$0.0	\$5.8	\$22.4
Transfer of excess returns	\$377.0	\$107.1	\$1.4	\$60.5	\$545.9
Total increase in CS	\$392.5	\$108.1	\$1.4	\$66.3	\$568.3
Counterfactual B2					
Allocative efficiency gain	\$10.2	\$0.7	\$0.0	\$3.7	\$14.6
Transfer of excess returns	\$311.4	\$87.9	\$1.1	\$50.6	\$451.0
Total increase in CS	\$321.6	\$88.6	\$1.1	\$54.3	\$465.6

Table 13: Consumer surplus estimates - Terminal Value \$m

	Voice	SMS	MMS	Data	Total
Factual A					
Counterfactual A1					
Allocative efficiency gain	\$1,597,327	\$97,201	\$1,263	\$719,657	\$2,415,448
Transfer of excess returns	\$7,285,016	\$1,970,432	\$25,072	\$1,266,310	\$10,546,830
Total increase in CS	\$8,882,343	\$2,067,633	\$26,334	\$1,985,967	\$12,962,278
Counterfactual A2					
Allocative efficiency gain	\$1,365,195	\$83,410	\$1,063	\$618,581	\$2,068,249
Transfer of excess returns	\$6,809,386	\$1,803,856	\$22,995	\$1,225,801	\$9,862,039
Total increase in CS	\$8,174,580	\$1,887,266	\$24,059	\$1,844,383	\$11,930,287
Factual B					
Counterfactual B1					
Allocative efficiency gain	\$103,617	\$6,436	\$89	\$41,928	\$152,070
Transfer of excess returns	\$2,100,216	\$568,061	\$7,228	\$365,068	\$3,040,573
Total increase in CS	\$2,203,833	\$574,497	\$7,317	\$406,996	\$3,192,643
Counterfactual B2					
Allocative efficiency gain	\$51,992	\$3,327	\$42	\$20,914	\$76,276
Transfer of excess returns	\$1,485,620	\$393,552	\$5,017	\$267,436	\$2,151,625
Total increase in CS	\$1,537,613	\$396,879	\$5,059	\$288,350	\$2,227,901

Table 14: Total surplus estimates – 5-year NPV (2011-2015) \$m

	Voice	SMS	MMS	Data	Total
Factual A					
Counterfactual A1					
Allocative efficiency gain	\$261.2	\$16.9	\$0.2	\$106.8	\$385.1

Effect of expanding demand on producer surplus	\$563.3	\$40.3	\$0.6	\$280.5	\$884.7
Total increase in surplus	\$824.5	\$57.2	\$0.8	\$387.3	\$1,269.9
Counterfactual A2					
Allocative efficiency gain	\$236.7	\$15.3	\$0.2	\$96.8	\$349.0
Effect of expanding demand on producer surplus	\$543.9	\$38.9	\$0.6	\$270.8	\$854.2
Total increase in surplus	\$780.7	\$54.2	\$0.8	\$367.6	\$1,203.2
Factual B					
Counterfactual B1					
Allocative efficiency gain	\$15.6	\$1.1	\$0.0	\$5.8	\$22.4
Effect of expanding demand on producer surplus	\$210.2	\$15.1	\$0.2	\$88.4	\$313.9
Total increase in surplus	\$225.8	\$16.2	\$0.2	\$94.1	\$336.3
Counterfactual B2					
Allocative efficiency gain	\$10.2	\$0.7	\$0.0	\$3.7	\$14.6
Effect of expanding demand on producer surplus	\$175.6	\$12.6	\$0.2	\$72.8	\$261.2
Total increase in surplus	\$185.8	\$13.3	\$0.2	\$76.5	\$275.8

Table 15: Total surplus estimates for mobile voice - Terminal Value \$m

	Voice	SMS	MMS	Data	Total
Factual A					
Counterfactual A1					
Allocative efficiency gain	\$1,597,327	\$97,201	\$1,263	\$719,657	\$2,415,448
Effect of expanding demand on producer surplus	\$2,716,851	\$184,112	\$2,914	\$1,613,373	\$4,517,250
Total increase in surplus	\$4,314,178	\$281,313	\$4,177	\$2,333,030	\$6,932,698
Counterfactual A2					
Allocative efficiency gain	\$1,365,195	\$83,410	\$1,063	\$618,581	\$2,068,249
Effect of expanding demand on producer surplus	\$2,550,798	\$173,555	\$2,695	\$1,523,404	\$4,250,454
Total increase in surplus	\$3,915,993	\$256,965	\$3,759	\$2,141,986	\$6,318,702
Factual B					
Counterfactual B1					
Allocative efficiency gain	\$103,617	\$6,436	\$89	\$41,928	\$152,070
Effect of expanding demand on producer surplus	\$1,122,921	\$74,064	\$1,150	\$533,062	\$1,731,196
Total increase in surplus	\$1,226,538	\$80,500	\$1,239	\$574,990	\$1,883,266
Counterfactual B2					
Allocative efficiency gain	\$51,992	\$3,327	\$42	\$20,914	\$76,276
Effect of expanding demand on producer surplus	\$817,902	\$55,574	\$797	\$385,970	\$1,260,243
Total increase in surplus	\$869,895	\$58,901	\$839	\$406,884	\$1,336,519

5.1. OTHER BENEFITS OF STRENGTHENED MOBILE COMPETITION

The results presented above quantify the consumer benefits and total surplus effects of mobile termination regulation. The intensified competition that will occur in the New Zealand mobile market once termination is regulated will increase the incentives of existing players to invest in network upgrades, new services and quality of service improvements. As mentioned earlier it would also create an environment where 2degrees is likely to roll-out nationally, allowing all New Zealanders to benefit from having a choice of three mobile networks.

An international survey of mobile broadband network capabilities reveals lagging investment in New Zealand. Vodafone's maximum mobile broadband speeds of 1.4Mbps are the equal

slowest among the countries surveyed, while Telecom's maximum speeds of 3Mbps fare only slightly better. In all of the survey countries in which Vodafone operates, it offers higher maximum speeds than it does in New Zealand.

Table 16 Network capabilities of surveyed international operators

Less than 3Mbps	3 – 3.5Mbps	3.6 – 5Mbps	Greater than 5Mbps
New Zealand (Vodafone)	New Zealand (Telecom)	Spain (Vodafone)	Ireland (Vodafone)
United States (Verizon)	Canada (Bell)	Austria (Orange)	Luxembourg (LuxGSM)
		Slovenia (Vodafone/SiMobil)	Poland (Orange)
		Denmark (TDC)	Bulgaria (Vodafone/Mtel)
		Australia (Vodafone)	Latvia (Tele2)
		Belgium (Orange/Mobistar)	Estonia (Tele2)
		Germany (Vodafone)	Italy (Vodafone)
		Malta (Vodafone)	Lithuania (Omnitel)
		Romania (Vodafone)	Singapore (Starhub)
		Slovakia (Orange)	Australia (Telstra)
		Czech Republic (Vodafone)	
		Cyprus (MTN)	
		Portugal (Vodafone)	

Note: Maximum advertised speeds available from surveyed operators

Source: Operator websites accessed 21 July 2009

6. CONCLUSIONS AND COMPARISONS WITH COMMISSION'S ESTIMATES

We have found that a continued absence of mobile termination regulation in New Zealand is likely to severely restrict the capacity of an entrant to contest the market, and may well foreclose entry entirely. International experience shows the latter scenario is not hypothetical. Rather, entry in a country which, at that time, exhibited a number of similar characteristics to New Zealand, notably the combination of intense on-net discounting and high mobile termination charges, failed.

In contrast, if mobile termination is regulated at or below the levels proposed by the Commission, thereby allowing effective and sustained entry, consumers stand to benefit from significant retail price reductions for mobile services. The Commission has recognised this and carried out an illustrative calculation of the benefits associated with mobile calling (though not other mobile services) associated with the scenario in which mobile termination regulation has the effect of reducing retail prices by 5%. It finds that consumer benefits would increase by \$42.6m, and that the gain in total surplus would be \$11.3m per annum. In our view this is a very conservative approach, yielding results that are an order of magnitude too low.

The Commission also examines the effects on FTM calling and finds that mobile termination regulation would result in a net benefit to FTM end users of \$92.8m to \$111.1m if a waterbed adjustment is made and \$272.10m to \$275.70m otherwise. It finds the increase in total surplus net of costs to be \$51.3m to \$55.3 including the waterbed adjustment, \$81.6m to



\$106.9m otherwise. While a waterbed adjustment may be appropriate in a perfectly competitive market, in the New Zealand market, which is currently characterised by high concentration and high barriers to entry, a material waterbed effect is extremely unlikely.

The Commission has estimated an NPV over 5 years, but as discussed in section 4, we consider it important that benefits beyond the 5-year period be captured by a Terminal Value calculation.

Bringing together our estimates of the surplus associated with mobile services, and the Commission's FTM result, shows very clearly that regulation would result in a huge increase in consumer benefits. It further demonstrates that the Commission's recommendation in its draft report that regulation should be implemented is strongly justified, and that abstaining from regulation would be in conflict with the Telecommunications Act.

Given the specific conditions in the New Zealand market and the relevant factual and counterfactual, the gains to consumers would likely be even higher if the regulated termination rates were more in line with LRIC. 2degrees has submitted that if mobile termination were set on the basis of a pure LRIC calculation (that is, where only traffic sensitive costs are included), the resulting rate would be unlikely to exceed around 1 cent per minute, and indeed would likely be considerably lower. Rerunning the Commission's FTM model using a 1 cent termination rates substantially increases the net gains associated with FTM calling to \$437m to \$454m for consumer surplus, and \$138m to \$139m for total surplus. To the extent that there are no material waterbed effects (as seems highly likely in New Zealand) there would likely be substantial gains to mobile consumers as well but we have not estimated these effects as it would require a detailed remodelling of the factu-als.