REPORT ON THE COMPETITIVENESS OF NEW ZEALAND MOBILE SERVICES

For:

THE NEW ZEALAND COMMERCE COMMISSION

Prepared by:

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1 EXECUTIVE SUMMARY

This report has been prepared to assist the Commerce Commission's investigation into whether or not to recommend regulating the termination of voice calls on cellular mobile telephone networks.

1.1 Introduction

In order to provide an independent, qualified and international perspective to the final stages of the Commission's investigation, this report investigates on behalf of the Commission:

- The OECD methodology used in the benchmarking of cellular retail service pricing
- The objections made to this methodology by Vodafone New Zealand (Vodafone) and Telecom New Zealand (TCNZ)

and

- The supporting documents cited by Vodafone and TCNZ in this regard.

The Ministry of Economic Development (MED) has asserted that New Zealand's retail cellular prices are, relatively speaking, among the most expensive in the OECD, based on an analysis of 2004 tariffs using the standard OECD methodology.

Vodafone and TCNZ have criticised this methodology stating that:

- It uses inappropriate assumptions about the levels of usage
- The data used is out of date and does not take into account certain kinds of tariffs
- Evidence from independent sources appears to contradict the OECD findings.

TelstraClear and Econet support, in principle, the conclusions of the MED, based on the OECD analysis.

1.2 The Process We Used

In order to determine the validity of the MED and Commission's findings and test the strength of the counterclaims made by the incumbent operators we have:

- Analysed the OECD benchmarking methodology
- Re-run the benchmarking with current tariff data
- Investigated the effect of using a series of hypothetical baskets.

Specific questions we have addressed are:

- Are the OECD benchmarking findings valid?
- To what extent are the submissions made by Vodafone and TCNZ valid?

We have also examined particular evidence cited by Vodafone and TCNZ from analyst reports written by Merrill Lynch and Citigroup Smith Barney (Citigroup).

1.3 Our Findings

There is widespread international consensus that the basic methodology of making tariff comparisons using defined baskets is sound. The composition of the OECD baskets has evolved over time in line with changes in the use of mobile telephones, most recently in 2002. We find no reason to dismiss this methodology and believe that the OECD mobile tariff comparison methodology is sound.

The conclusions which the MED has drawn from the OECD tariff comparison, and the Ministry's variations on the OECD figures, are reasonable.

Our sensitivity analysis of a wide range of alternative scenarios and assumptions does not disturb MED's conclusion that cellular services in New Zealand are relatively expensive.

Using updated tariff sets for February 2005, New Zealand ranks out of 30 OECD countries:

- 23rd for the low user basket of services
- 29th for the medium user basket
- 30th for the high user basket,
- 30th if the three baskets are weighted equally.

These finding were run excluding GST.

In order to assess the submission that the OECD baskets assumed usage levels which were too high to be representative of New Zealand, we conducted sensitivity analyses on the OECD model using a variety of hypothetical baskets of usage based on February 2005 tariff data, finding that out of 30 countries:

- A basket of usage which is half the OECD's low user basket places New Zealand 23rd

- A basket of usage which is one quarter the OECD's low user basket places New Zealand 21st

To assess the picture on a voice only basis we took the OECD's low user basket and excluding text messaging; this results in New Zealand coming 25th out of 30 countries using February 2005 tariffs.

To assess the relative position in respect of data services we took the OECD low user basket and excluded all voice calls (i.e. SMS or text messages only); this placed New Zealand 19th, based on February 2005 data.

This indicates that tariffs for SMS in New Zealand are in line with the OECD average. However, on all the scenarios we have run, New Zealand is always more expensive than the OECD average once voice calls are included, and is usually in the bottom third of countries. Our findings are summarised in Table 1 below.

We do not believe it is appropriate to use the actual usage data for one country to compare that country with others, because we believe that users adapt their behaviour to a large degree to the peculiarities of the tariff structure in that country, and thus such comparisons will always show the country in question in the best possible light. Nevertheless, we also populated the February 2005 OECD model with real data from New Zealand, supplied by Vodafone and TCNZ.

Using the data supplied by Vodafone resulted in an improved ranking for low and medium users (to 17th and 22nd respectively) and a worsening of the rank for high users (to 30th). Using the data supplied by TCNZ, New Zealand ranked 20th for low users, 28th for medium users and 30th for high users.

Overall, on all the scenarios we have run, New Zealand is more expensive than the OECD average, and usually in the bottom third of countries.

1.4 Addressing the Objections

TCNZ cites revenue per minute figures calculated by Merrill Lynch. These give a different view, but the following factors effectively rules out any comparison with the OECD model:

- The Merrill Lynch figures includes termination revenues;
- They exclude data revenues (a growing part of the retail market);
- Different operators report their numbers in different ways (e.g. treatment of international roamers; include or exclude equipment sales), and Merrill Lynch does not attempt to adjust for this;
- Merrill Lynch makes no attempt to compare the figures on either a 10-year average exchange rate basis or a PPP basis;
- Merrill Lynch does not say anything about affordability.

Table 1 : New Zealand's Ranking among 30 OECD countries using various scenarios.

Scenario Description	Rank using February 2004 tariffs (out of 30)	Rank using February 2005 tariffs (out of 30)
Standard OECD Low User Basket	28	23
Standard OECD Medium User Basket	29	30
Standard OECD High User Basket	29	29
Half the OECD Low User Basket	26	21
One Quarter of the OECD Low User Basket	26	21
OECD Low User Basket – Voice Calls Only	25	25
OECD Low User Basket – SMS Only	15	19

Citigroup's report does not bear the interpretation which TCNZ has put on it, that New Zealand prices are "on average similar or significantly better than the 10 other countries included in this study". By the standards which TCNZ set, New Zealand prices are significantly better than only 3 of the 10 other countries. We state a number of serious reservations about the validity of the comparison as, in any event, the basis of Citigroup's figures are different from OECD's and the Citigroup report was not intended to be used for tariff comparisons between countries.

Vodafone criticised the OECD methodology, but we found that Vodafone's figures contained a calculation mistake (as Vodafone has now acknowledged). Vodafone also complained that the tariff data for New Zealand was out of date. However, we have found that using more up-to-date tariff data does not alter the ranking of New Zealand significantly.

TCNZ claims there are significant flaws with the MED analysis of the OECD data as it does not take into account the unique purchasing patterns of New Zealanders, fails to measure the extent of mobile penetration and makes no attempt to link penetration to pricing. However, we did not find that adopting lower usage baskets significantly affected New Zealand's rankings (as shown in Table 1 above), nor did the use of TCNZ's own user data. Further, TCNZ provided no real supporting evidence for its other claims.

Our overall conclusions, therefore, are that we see no major flaws in the OECD's methodology, and that New Zealand's retail cellular services for voice calls continue to be relatively expensive compared to other OECD countries.

2 INTRODUCTION AND SCOPE OF WORK

2.1 About this Report

This report has been prepared by Argo TMC for the New Zealand Commerce Commission ("the Commission").

The report investigates the OECD methodology used to benchmark cellular retail services, the objections made to this methodology by Vodafone New Zealand Ltd ("Vodafone") and Telecom New Zealand Limited ("TCNZ") in the context of their comments on the Commission's Schedule 3 investigation into regulation of mobile termination and the supporting documents cited by Vodafone and TCNZ in this regard.

This report was researched and written during April and May 2005.

2.2 The Debate about Mobile Pricing in New Zealand

In October 2004, the Commission released a draft report of its Schedule 3 investigation into the regulation of mobile termination rates in New Zealand[1]. In it, the Commission found that mobile operators in New Zealand are subject to limited competition in regard to termination of calls on their respective networks. The Commission went on examine whether mobile termination services should be subject to regulation and formed a preliminary view that such regulation would deliver a net benefit to end-users.

The Commission stated that it did not believe that any excess profits made by the cellular operators from mobile termination would be dispersed through retail competition for cellular subscriptions and services. It stated that it had not reached a definitive view on whether retail mobile services in New Zealand were subject to limited competition, but noted that retail mobile prices in New Zealand appear to have been relatively stable in recent years, and also relatively high.

Evidence of relatively high retail mobile prices in New Zealand included a report published earlier in 2004 by the MED[2]. The MED report compared the price of standard OECD baskets of cellular services in 30 OECD countries, and, accounting for purchasing

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[1] Commerce Commission, *Schedule 3 Investigation into Regulation of Mobile Termination, Draft Report*, 18 October 2004.

[2] Ministry of Economic Development, *Benchmarking the Comparative Performance of New Zealand's Telecommunications Regime*, 30 June 2004.

power parity, found that New Zealand retail mobile prices for residential and small business users were among the highest in the countries under comparison: overall New Zealand was ranked 29th out of 30 countries. The MED report stated that mobile prices in New Zealand would need to fall by 45% to place New Zealand's mobile prices in the top half of the 30 countries.

On 30 November 2004, Vodafone[3] and TCNZ[4] submitted their respective responses to the Commission's draft report on mobile termination. Both operators argued against the Commission's conclusions about the retail cellular market in New Zealand. In summary they argued that for various reasons the OECD methodology was flawed for comparing cellular prices, and therefore not a fair reflection of the true situation in New Zealand. In addition they argued that the cellular market in New Zealand is competitive.

Both operators cited external reports in support of their submissions on cellular retail prices. Vodafone cited a report by Merrill Lynch[5], which compared mobile prices and markets in 46 countries. TCNZ cited a report by Citigroup Smith Barney (Citigroup)[6], comparing the mobile markets of New Zealand and Australia.

2.3 __Scope of Work__

Argo TMC's scope of work in relation to this report was as follows:

- To examine the OECD methodology for comparing cellular pricing, and to determine the degree to which this is a reasonable approach to international benchmarking of cellular pricing

- To examine the objections to the Commission's statements about the New Zealand retail cellular market made by Vodafone and TCNZ, and the degree to which these objections are reasonable

- To examine the analysts' reports by Merrill Lynch and Citigroup referred to by Vodafone and TCNZ, and to analyse the degree to which these reports support the submissions being made by the operators

- To highlight other observations made and conclusions drawn in the course of this work about the competitiveness of the retail market for cellular services in New Zealand.

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[3] Vodafone, *Submission to the Commerce Commission, Schedule 3 Investigation into Regulation of Mobile Termination, Draft Report,* 30 November 2004

[4] TCNZ, *Submission in Respect of the Commerce Commission's Draft Report for its Schedule 3 Investigation into the Regulation of Mobile Termination,* 30 November 2004

[5] Merrill Lynch, *Global Wireless Matrix* 2Q04, 29 September 2004

[6] Citigroup Smith Barney, *Aust / NZ Mobile Study: Can Mobile Surprise?,* 22 November 2004

2.3.1 How this Document Addresses the Scope of Work

Section 3 of this report discusses the background to the debate about retail cellular benchmarking in New Zealand, and outlines the key issues raised by Vodafone and TCNZ in their submissions against the MED findings.

Section 4 examines the general issues surrounding international benchmarking of telecommunications services.

Section 5 explains the methodology used by the OECD and how this addresses some of the issues highlighted in section 4. We conclude that, although the OECD methodology has its limitations, it is still the commonly accepted international tool for comparing cellular tariffs between countries.

Section 5 then goes on to show the results of various scenarios we have run using the OECD benchmarking tool. These include:

- Using more up-to-date information
- Reducing the levels of usage of the low-user basket to half and then to a quarter of that used by the OECD
- Assuming voice calls only and no texts, and vice versa, to establish which of these two components makes New Zealand expensive (we find that it is mainly the cost of voice calls which causes New Zealand to score badly against other countries
- Using actual usage data supplied by Vodafone and TCNZ

We show that, whichever scenario is run, New Zealand is always in the bottom half of OECD countries, and usually in the bottom third.

Section 6 examines the independent analyst reports from Merrill Lynch and Citigroup cited by Vodafone and TCNZ. We find that the Citigroup report does not bear the interpretation which TCNZ has put on it. We conclude that the Merrill Lynch report should not be used as an indicator of price or affordability of retail services since data provided by Merrill Lynch include termination revenues, exclude data revenues and do not attempt to rationalise the different reporting methods used by different operators.

Section 7 is a summary of our findings.

2.3 About Argo TMC

Argo TMC is a management consulting company with its focus on telecoms. Based in the Netherlands, we work with clients throughout the world including The Middle East, Africa and Asia Pacific as well as in Western, Eastern and Central Europe. Among our clients we count large corporate end-users, the established and emerging fixed and mobile telecoms operators as well as service providers, regulators and investors in the telecoms industry.

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3 BACKGROUND AND KEY ISSUES

This section examines the background to the New Zealand cellular market and the debate about cellular retail tariffs, as well as outlining the key issues which we address in the rest of the report.

3.3 Mobile Termination Rates

The Commission decided to investigate mobile termination after considering complaints that a lack of competition in the mobile termination market resulted in charges for fixed-to-mobile calls in New Zealand that were unreasonably high. Mobile termination rates are the fees mobile phone companies charge other carriers to terminate calls on their networks and are a significant input cost in providing the retail service of fixed-to-mobile and mobile-to-mobile calls from one mobile network to another.

The Commission commenced its mobile termination investigation in May 2004 and began the process of public consultation with the publication of its Issues Paper on 22 June 2004 and the Draft Report on 18 October 2004.

3.4 The New Zealand Cellular Landscape

New Zealand has two cellular operators: Vodafone and TCNZ, each operating one cellular network. Vodafone's network uses GSM technology, whereas TCNZ's uses CDMA. Both operators offer data communications over their cellular networks. Vodafone's GSM network uses GPRS technology, and the TCNZ network uses 1XRTT and, more recently, EV-DO.

On a global basis, GSM is the more widely used of the two so-called second generation technologies. According to the GSM MoU, the association for GSM operators and manufacturers, at the end of 2004, the association's operator members numbered 650 in 210 countries, serving 1266 million users[7]. Vodafone offers international roaming to almost all of these operator members, allowing its New Zealand customers to use their mobile phones on these roaming partners' GSM networks. In contrast, CDMA is less widely adopted. It is mainly used in the United States, Canada, Latin America, China, South Korea, Indonesia and Australia. CDMA users at December 2004 were estimated by the GSM MoU at 233 million and by the equivalent organisation for CDMA at over 240 million[8]. TCNZ customers therefore have far fewer opportunities for international roaming without change of handset than are available to Vodafone customers.

[7] http://www.gsmworld.com/news/statistics/pdf/gsma_stats_q4_04.pdf, accessed on 22 April 2005

[8] http://www.cdg.org/worldwide/cdma_world_subscriber.asp, accessed on 22 April 2005

At the end of 2004, there were approximately 3.3 million cellular subscribers in New Zealand. Approximately 56%[9] of these subscribers were Vodafone customers, with the remainder being TCNZ customers.

There are four spectrum licence holders for 3G networks in New Zealand: Vodafone, TCNZ, TelstraClear and Econet Wireless New Zealand (Econet). Neither TelstraClear nor Econet have begun to build their networks, citing a lack of competitive access to infrastructure[10] and the lack of number portability[11] among their reasons for not doing so.

3.5 Mobile Pricing Comparisons

Submissions about the OECD benchmarking methodology for tariff comparisons were received from market participants including the two current mobile operators, Vodafone and TCNZ, at the end of November 2004. Both operators argue that the Draft Report was inaccurate and flawed and used out-of-date material. The key issues raised are summarised in the next section.

A conference was held from 23 to 25 February 2005 where interested parties submitted supporting submissions and cases.

The Commission requested Argo TMC to analyse, examine and comment on these submissions from the mobile operators about tariff benchmarking for the purposes of the mobile termination investigation.

3.6 Key Issues

This study examines the evidence which has been used by both sides in the debate about the relative level of retail mobile pricing in New Zealand, and tests the validity of the submissions and data used.

Central to the debate is the assertion by the MED that New Zealand's retail cellular prices are, relatively speaking, among the most expensive in the OECD. This is based on analysis performed using a standard OECD methodology in 2004.

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[9] Mobile Phone Growth Stats - Commerce Commission - Sourced from figures publicly released by TCNZ and Vodafone

[10] Econet Wireless New Zealand – *Cross-submissions commenting on other parties' submissions*- 23 December 2004 – page 3

[11] Econet Wireless New Zealand – *Cross-submissions commenting on other parties' submissions*- 23 December 2004 – page 15 (answer to paragraph 147)

Vodafone and TCNZ have criticised this methodology. Their criticisms include the following:

- It uses inappropriate assumptions about the levels of usage
- The data used is out of date
- It does not take into account certain kinds of tariffs, such as on-net tariffs (where customers on one network calling numbers on the same network receive heavily discounted or free calls), capped tariffs, and individually negotiated tariffs for larger business customers..
- Other evidence from independent sources appears to contradict the OECD findings.

On the other hand, TelstraClear and Econet support in principle the conclusions of the MED, based on the OECD analysis.

Vodafone further submitted that the mobile services market is not mature, whereas TCNZ argued that the market was not realistically defined and that, in any case, regulation would not promote competition, but would further constrain competition. Vodafone also contended that the OECD data used was out of date.

4 THE CHALLENGES OF TARIFF BENCHMARKING AS A METHODOLOGY

This section examines the major issues connected with international tariff benchmarking.

Robust international price comparisons of cellular service might help identify whether the New Zealand market is competitive, although if prices are higher in New Zealand it could be because costs are higher.

Some of the methodological flaws commonly encountered in international price comparisons include:

- The comparison of a basket of products at a ‘snapshot in time’, which takes no account of exchange rate trends and may take excessive account of transient phenomena;
- Attempts to compare products based on the consumption patterns of a single country, with the effect of artificially increasing relative prices in other countries; price comparisons using baskets tend to show that in the countries where the pattern of consumption is nearest to that of the basket prices are lowest;
- The exclusion of demand-side factors by not attempting to weight baskets according to the preferences of consumers in the countries surveyed; and
- Basing results solely on tax-inclusive price levels, thus reflecting a pricing factor beyond operators’ control.

To tackle each of the criticisms above in turn, one might proceed as follows:

- Comparing product prices on three levels:
    1. an un-weighted basis,
    2. weighting prices by spend per capita data to reflect consumer preferences in each country, and
    3. analysing the number of products cheaper in each country such that no product or set of products has too large an influence on national price levels;
- Repeating the price comparison sufficiently often that it is safe to ignore the problem that some countries may be more subject to short-term price promotions than others;
- Determining the appropriate exchange rate to use - this could be the current exchange rate, the equilibrium exchange rate (not easy to determine) or the Purchasing Power Parity (PPP) which is an exchange rate calculated for various

purposes including international price comparisons and designed to get away from the difficulty that market exchange rates often do not reflect relative purchasing power. (Another possibility might be to measure the hours of work at the average wage needed to afford the basket, but this is probably an inferior option as it would introduce statistical difficulties in defining wages and hours worked); and

- Stating relative price levels on a tax-inclusive (for the retail consumer) and tax-exclusive (for the business consumer) basis, but bearing in mind that operators have no influence over tax levels.

We turn now to the OECD methodology, implemented by Teligen.

5 OECD/TELIGEN METHODOLOGY ANALYSIS

This section outlines the methodology used the by the OECD. It explains how this methodology has become widely accepted, and how it attempts to deal with some of the issues raised in Section 4.

We explain the results of various scenarios run using the OECD model, including lower usage levels, a text-only basket, a voice-only basket, and the use of real data supplied by Vodafone and TCNZ.

The OECD's methodology developed in 1990 and refined since then[12], takes most of the issues mentioned in the previous section into account. The baskets circumvent the difficulties which would be caused by comparing elements of individual tariffs. The figures are compiled with care by an impartial international organisation, or its consultants, and there is no reason to suppose any deliberate or unintended bias in the process. The results have generally been thought to be reliable. No other international tariff comparison is routinely undertaken by an organisation of comparable prestige.

The OECD's methodology aims at providing an international comparison. Naturally the basket chosen is not exactly the basket of any individual OECD member. Its selection however was not designed to discriminate against New Zealand, or any other country.

A comparison of New Zealand consumption data at New Zealand prices and at the prices prevailing in other countries may well put New Zealand in a more favourable light. This is because the New Zealand basket will have been influenced by New Zealand prices. Nevertheless if such a comparison were to show New Zealand cellular prices to be higher than in certain other countries it could well raise questions about the competitiveness of the cellular retail market.

The Ministry of Economic Development report "Benchmarking the Comparative Performance of New Zealand's Telecommunications Regime" assesses the relative performance of New Zealand's cellular telephone industry by using the standard basket of cellular services developed by the OECD as a tool to benchmark differing countries.

We have updated the tariff and other datasets used in MED's analysis with data from February 2005 in order to determine if the rankings had changed with this current data.

This Section initially reviews the OECD methodology. Then, with our updated rankings as well as the initial findings from the June 2004 MED benchmarking findings[13] and the

[12] See Section 5.1.2

[13] Ministry of Economic Development, *Benchmarking the Comparative Performance of New Zealand's Telecommunications Regime*, 30 June 2004

Commission's October 2004 draft report,[14] we have analysed the results and conducted further sensitivity analysis. The sensitivity analysis was performed by modifying the composition of the baskets used and the parameters included in the model.

In this manner we have attempted to determine the validity of the methodology used, and the validity of the initial findings of the Commission and the MED, by looking at the rankings from as many perspectives as possible within the time and resource constraints of the project.

5.1 <u>Summary of and Comments on Methodology</u>

The OECD benchmarking methodology is fundamental to the debate as to whether the retail market for cellular services in New Zealand is subject to limited competition. As both operators have criticised this methodology it is necessary to review, analyse and comment on the OECD benchmarking methodology.

5.1.1 Summary of Methodology

Approach

The OECD developed the basket methodology for tariff comparisons in the late 1980s, principally for Public Switched Telecommunications Networks (PSTN). It did so because of dissatisfaction with the then existing methodologies. Among the difficulties then were that some methodologies used baskets based on data from a single country where the data itself could be challenged as being out of date; and that no distinction was made between business and residential users.

The central idea of the OECD methodology was, and is, that for meaningful international tariff comparisons it is essential to compare the tariffs on the basis of representative consumption baskets. It was understood right from the outset that these representative baskets might not accurately represent any particular OECD member, but that was not the purpose. The idea was that the baskets would allow a comparison between two countries even if one had high fixed charges and low usage charges and another country had the opposite tariff structure.

Details of the OECD methodology

The OECD methodology currently relies on three different types of users based on their volumes of calls and SMS usage: low users, medium users and high users. For each type of user a "basket" of services has been developed which is designed to represent the typical activity for each type of user.

[14] Commerce Commission, *Schedule 3 Investigation into Regulation of Mobile Termination, Draft Report*, 18 October 2004.

The services, usage and calling patterns used in these baskets have been derived from work agreed to at the Mobile Basket Workshop in London in October 2001, which included representatives from a large number of OECD countries, regulators and operators. Details of usage and calling patterns are based on averages or summaries of the information provided by these representatives and other parties who responded to an OECD RFI.

As a minimum, the two largest operators are included for each OECD country. If these two operators have less than 50% market share (based on subscriber numbers) additional operators are included.

All of the most common packages are included for each operator. The 2004 survey contained 675 packages across the 30 OECD countries (increasing to 739 for the February 2005 survey).

5.1.1.1 Other Features of the Methodology

Full details of the OECD mobile basket definitions are set out in Appendix I. The most important aspects are the following:

- Connection charges are amortized over three years
- An additional basket to represent the usage of pre-paid customers is not provided because the low-user basket is believed to be similar
- 67% local and 33% national calls
- Call allowances included in the monthly rental are deducted from the usage value once the basket is calculated:
    - The deduction cannot be larger than the actual usage value, i.e. negative usage is not allowed.
    - No transfer of unused value to next month is taken into account
- Inclusive minutes or SMS are deducted from the basket usage before starting the calculation of usage cost.
- Inclusive minutes are assumed to be used up with the same call timings and geographic calling patterns described below:
    - Where the inclusive minutes are clearly limited to specific destinations or times of day this will be taken into account.
    - No transfer of unused minutes is taken into account.

- The calculations can be performed including or excluding VAT(GST); and using exchange rates or PPP.

The Teligen model implements the OECD methodology and in addition provides further options which the user can define, e.g. special baskets, special exchange rates.

As will be discussed in a later section, the OECD baskets may not be able to take into account every possible tariff variation and pricing feature. Complete details of the composition and elements included in the OECD baskets are found in Table 2 below.

5.1.1.2 OECD Basket Composition

The actual calculation of the baskets is performed in a sophisticated Microsoft Excel spreadsheet created by Teligen in the UK. Once a user has selected the various options they wish to test (VAT, or GST in New Zealand, PPP, call-units, greater or lesser call volumes etc.) the spreadsheet will automatically run a scenario for all 739 tariff plans (2005) and the 60+ operators from the 30 OECD countries.

Table 2 : OECD Basket Composition

	Volumes per month		Outgoing national calls %				Call Timings %			Call durations (minutes)		
	Outgoing calls	SMS	Fixed local	Fixed national	Mobile on-net	Mobile off-net	Peak	Off-peak	Weekend	Fixed national	Mobile on-net	Mobile off-net
Low user	25	30	28%	14%	40%	18%	38%	35%	27%	1.6	1.4	1.4
Medium user	75	35	24%	12%	43%	21%	47%	30%	23%	2.1	1.9	1.9
High user	150	42	26%	14%	42%	18%	63%	22%	15%	2.2	2	2.1

Using the OECD assumptions about how the numbers of calls are distributed by destination and duration, the OECD baskets produce the following number of minutes per month.

Table 3 : OECD Baskets and Minutes per Month

		Destination				Duration			
	Outgoing calls per month	Fixed Local area	Fixed National area	On-net mobile	Off-net mobile	Fixed National	On-net Mobile	Off-net Mobile	Minutes per month
Low user	25	28%	14%	40%	18%	1.6	1.4	1.4	37
Medium user	75	24%	12%	43%	21%	2.1	1.9	1.9	148
High user	150	26%	14%	42%	18%	2.2	2	2.1	315

Users of the Teligen tool also have the option of inputting up to four of their own tariffs into the calculations, to test how various tariff options will calculate using the OECD baskets. The number of tariff options that can be accounted for is quite extensive and the tariff options include bundled voice minutes and SMS, applicability of included minutes (daytime, evenings, weekends, on-net, off-net, etc), call tariffs (setup, per-call unit charges, airtime etc) and a number of other variables.

Once the tariffs have been calculated for all countries and tariff packages, they are displayed as a table ranked from lowest to highest tariffs with each operator's lowest tariff plan for a given user basket being listed. It is important to note that overall country rankings are determined by the first instance of a country's appearance on the list as opposed to an average of a country's operators' tariffs.

For the purposes of this report, the provider in the number one position or "first" place has the *lowest* tariffs. Table 4 provides an example of output from the Teligen/OECD Model

Table 4 : Example Output of Teligen/OECD Model

Country, Provider	Package, Option	Fixed	Usage	Grand Total
Denmark, TDC Mobil	MobilExtra200	47.91	66.24	114.15
Denmark, Sonofon	Debillos	46.44	71.64	118.09
Iceland, Siminn	Frelsi	10.68	107.82	118.51
Etc…				

5.1.2 Comments on Methodology

The Ministry of Economic Development noted in the background section of "Benchmarking the Comparative Performance of New Zealand's Telecommunications Regime" that there are known limitations to the use of representative 'baskets' of telecommunications services:

- The basket of services may not be representative of the typical user within a country
- Baskets adjust imperfectly for differing prices across countries of inputs to local services by using a suitable exchange rate, such as a purchasing power parity exchange rate
- Baskets do not easily take into account the effects of network density including scale and scope economies
- A basket of services does not take into account productivity differences between countries that are outside of the control of the telecommunications industry
- Some country-specific services may not be directly comparable
- The methodologies do not provide uncertainty bounds for assessing the reliability of the resultant rankings.

Despite these limitations, the Ministry of Economic Development believes that the basket approach remains a valid way of assessing New Zealand's relative performance and has attempted to take these methodological limitations to the basket approach into account where possible, for example by undertaking sensitivity analyses of baskets of different composition.

Even with the limitations noted above, the OECD basket represents the primary tool for the development of the league-table for comparing cellular tariffs between countries. Developing a standardized way of taking an "average" user and determining what their costs would be on any given cellular network is a crucial step in any attempt to benchmark and compare countries. In addition, no-one has yet developed a better methodology; in considering possible alternatives, it should be borne in mind that operators are very reluctant to release their data about usage patterns on their networks.

It is instructive to compare the current methodology with the original one established in 1988-89 and published in 1990[15]. The principles which were then proposed, and agreed, were developed principally for PSTN comparisons, as shown in Table 5 below, which also shows to what extent the principles are still in our view adhered to today in the mobile tariff methodology.

Table 5 : Principles of the OECD tariff comparison methodology

1990 principle[16]	Is the principle still adhered to today for mobile tariff comparisons?
1. The methodology for tariff comparisons should initially be developed for non-mobile, real-time, voice telephony charges and later extended to a wider range of services including international calls, mobile communication services, leased lines and packet-switched data communications.	(no longer relevant)
2. The methodology should include installation charges, subscription charges (rental) and usage charges but should exclude equipment rental.	Yes.
3. Rather than simple rate comparisons, the methodology should use a basket of charges composed of fixed charges and national call charges. These two components should be calculated separately and then combined in a ratio which approximates to the OECD average revenue pattern for Public Telecommunications Operators and weighted according to average annual subscriber telephone bills.	The mobile tariff comparisons are still based on a basket approach. However, the mobile basket no longer has fixed and usage charges calculated separately and then weighted. Instead, the ratio of fixed to usage charges which arises is whatever results from the application of the tariffs to the defined user baskets.
4. The fixed charges should include annual subscription (rental) plus a proportion of the installation (connection) charge for new subscribers.	Yes.

[15] Originally published by OECD in its Information, Computer and Communications Policy series as ICCP 22, "Performance Indicators for Public Telecommunications Operators", now available at http://www.oecd.org/document/33/0,2340,en_2649_34223_1911713_1_1_1_1,00.html

[16] *ICCP 22*, pp43-44.

1990 principle[16]	Is the principle still adhered to today for mobile tariff comparisons?
5. The usage charges should be proportional to the fixed charges and should include both local and long distance charges. They should be based on a basket of calls distributed by distance, time of day/week and duration according to usage patterns identified in international research.	The mobile basket no longer has a requirement that usage charges should be proportional to fixed charges (see 3. above). However a basket of calls distributed by distance, time of day/week and duration is still used for the mobile tariff comparisons.
6. A separate basket should be calculated for international calls using call pairs weighted by the likelihood of calling a particular destination (approximated by the value of telephone revenues of the called country).	A separate basket for international calls was not calculated for mobile, perhaps because mobile telephony was in its infancy. Calls to international destinations were excluded in the first mobile basket, as they are now.
7. Separate baskets should be constructed to reflect distinctive usage patterns, for instance for business and residential subscriber groups.	This principle did not apply to mobile at the outset, because all usage was effectively by business users. Now baskets have been defined for low, medium and high users (but not for business or residential).
8. The preferred units for comparison should be purchasing power parities (PPPs) expressed in average US Dollar values for the previous year.	Yes.
Modifications for mobile tariff comparisons[17]: ▪ Fewer geographical distance zones, but with an extra zone for on-net calls ▪ Installation fee amortised over 3 years instead of 5 (as in the business voice telephony model) ▪ Ratio between fixed charges to usage charges adjusted from 20:80 in the business voice telephone model to 33:67 ▪ 852 calls, instead of 2634 in the standard business basket.	▪ Now two geographical distance bands, plus two zones for on-net and off-net calls. ▪ Installation amortisation still 3 years. ▪ A fixed ratio is no longer a requirement (see 3. above). ▪ The number of calls varies between baskets. 852 calls is similar to the 900 in the medium user basket.

Our conclusion from the table above is that the methodology for mobile tariff comparisons has stood the test of time. The main principles proposed over 15 years ago are still being adhered to, although the basket definitions were changed in 2000 and 2002 in line with changes in use of mobile telephones. In 2002, for example, SMS messages were added. The consensus at the workshops attended by government representatives, regulators and operators which led to the 2000 and 2002 changes was that the basic methodology of making tariff comparisons using defined baskets is sound. However, the OECD continues to work to improve these mobile tariff baskets and is planning a workshop along with Teligen in Rome in June 2005 to improve the relevance and

[17] *ICCP 22*, pp62-63.

applicability of the tariff baskets.

Judging by the fact that the tariff comparisons are still being made under the OECD's auspices, this would appear to be continued consensus for the methodology among OECD member governments and telecommunications regulators. In addition we are not aware of any government or regulator, or any respected academics, who take a contrary view. We also believe that most if not all of those who produced tariff comparisons before the OECD started to do so have now stopped.

While a number of tariff, traffic and service options are included in the tool in an attempt to account for many different types of service packages, as discussed later in this document, the operator responses to the Commission document suggest that they do not believe the Teligen/OECD tool is flexible enough to encompass all of the tariff options they offer (such as TCNZ's $10 Text offer).

The baskets have been criticised by both Vodafone and TCNZ as being unrepresentative. To some extent this is deliberate, to get round the observed problem that tariff comparisons based on the consumption pattern of a particular country almost inevitably show that country as having a lower cost to purchase the basket - this is what should be expected, since usage patterns will be influenced by tariffs. However, there is no reason to think that the definition of the baskets is deliberately or accidentally biased against New Zealand. Moreover representatives of New Zealand were able to take part in the workshops and other preparations which led to the redefinitions of the baskets.

If an operator has a serious concern that the baskets are unrepresentative, then it is free to construct a new basket and price it on the tariffs prevailing in New Zealand and abroad. Vodafone and TCNZ have supplied usage data to the Commission, and we have run scenarios using this information in the OECD model. However, we do not believe it is appropriate to benchmark affordability using the usage patterns of one country as the basis, since users in a particular country will tend to adapt their usage patterns to the particular tariff structure which prevails in that country.

An additional criticism of the OECD tariff baskets is that they are out of date. As the basket definitions rely on input from the 30 OECD countries and other industry experts, it is clear that they will tend to lag market developments as "committee inertia" will delay changes even when they have been recognized as needed and therefore the tariff basket definitions will tend to be somewhat reactive as opposed to proactive.

5.2 Update on NZ ranking using current (February 2005) dataset

One criticism of the Ministry of Economic Development's benchmarking report is that the OECD data is out of date. The report, issued in June 2004, was based on data from February 2004. Both Vodafone and TCNZ have stressed that a number of new tariff plans have been launched since the Commission report was issued and it failed to take into account some the latest tariff plans launched by both Vodafone and TCNZ.

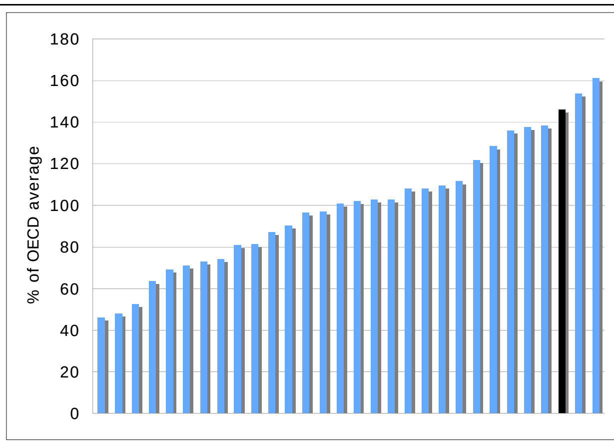
To examine what effect these new tariff plans have on New Zealand's standing in the OECD rankings, we have updated the OECD/Teligen model using the latest available figures (February 2005).

It is important to note that this comparison is based on the *existing* OECD user basket model and in this instance; no changes have been made to the methodology of how the tariffs are calculated.

A comparison including tax would be relevant for looking at relative affordability by users in different countries. Our mission however is to look at tariffs as an indicator of competitiveness in the retail cellular market. The rate of tax is irrelevant to that and so appropriately, these finding have been run excluding GST.

The results are illustrated below with each New Zealand ranking highlighted relative to other countries:

Feb 2004



Feb 2005

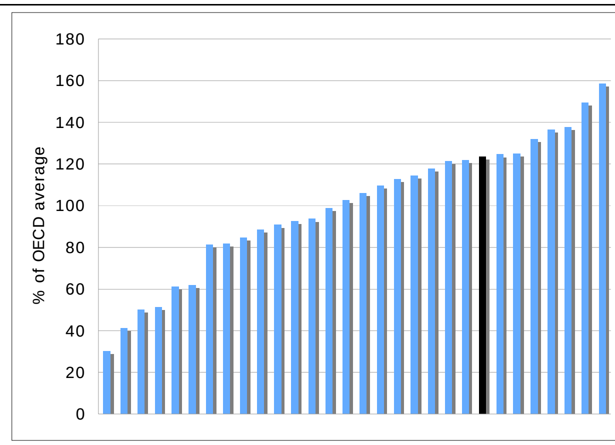


Figure 1 : OECD Low User Mobile Basket: Basket price (using PPP)

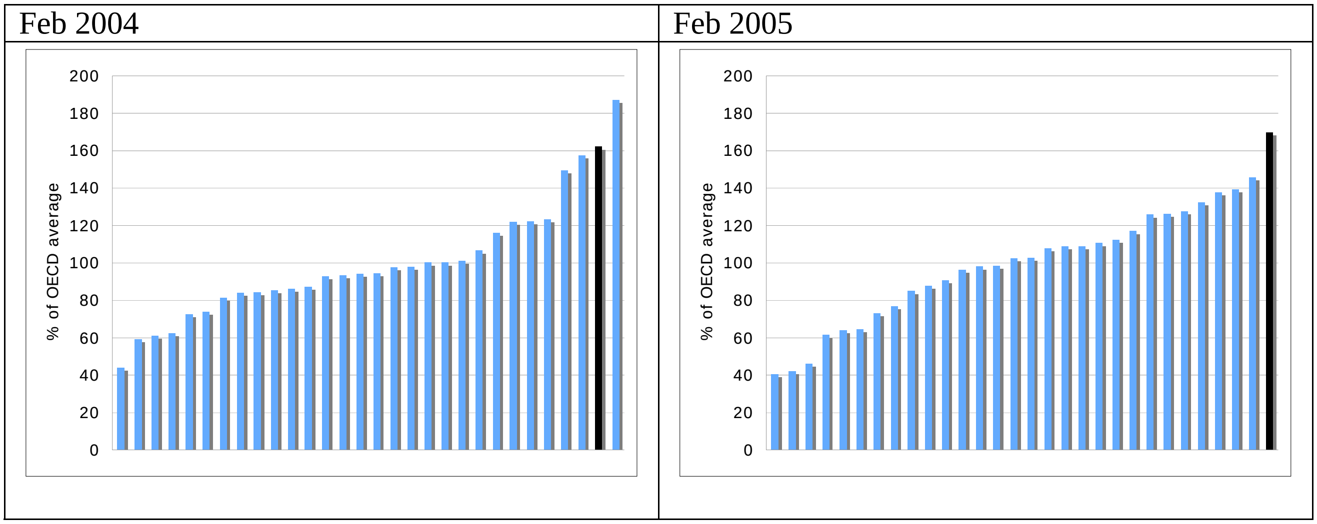


Figure 2 : OECD Medium User Mobile Basket: Basket price (using PPP)

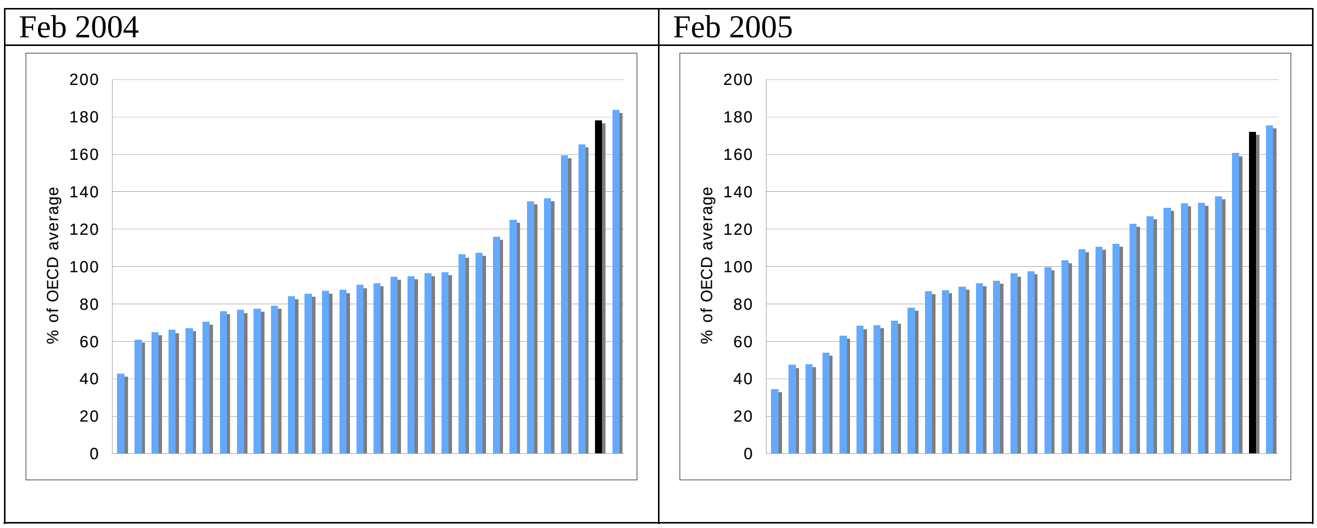
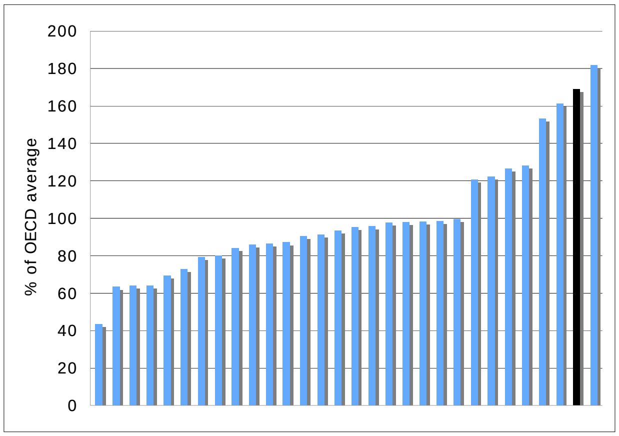


Figure 3 : OECD High User Mobile Basket: Basket price (using PPP)

Feb 2004



Feb 2005

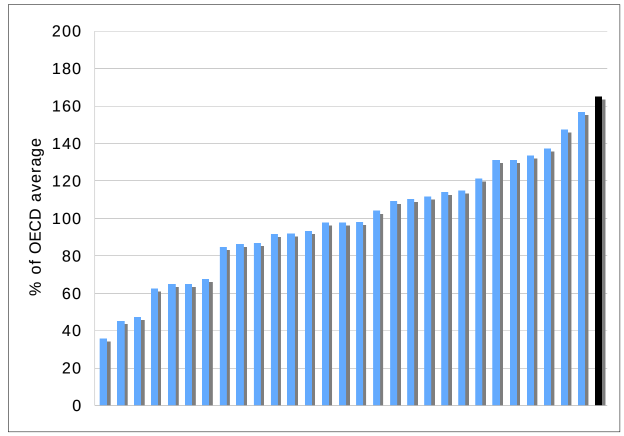


Figure 4 : OECD Combined Un-weighted User Mobile Basket: Basket price (using PPP)

Table 6 below summarizes the changes between the February 2004 and February 2005 data:

Table 6 : Difference between Feb 2004 & Feb 2005 data

	2004		2005	
OECD standard mobile services basket	Country Ranking (out of 30)	Basket price as % of OECD Average	Country Ranking (out of 30)	Basket price as % of OECD Average
Low User	28	146	23	123
Medium User	29	162	30	170
High User	29	178	29	172
Combined (Un-weighted)	29	not applicable	30	not applicable

5.3 Analysis of findings contained in June/October reports

Notwithstanding the limitations of the 'basket of services' methodology highlighted by the Ministry of Economic Development (see Section 5.1.2 above), we believe the methodology is a relevant tool and adds additional insight to the debate over the extent of competition in the New Zealand mobile services market.

When analyzing the findings contained in the Commission and Ministry of Economic Development reports, a number of issues emerge that suggest there is only limited downward pressure on tariffs when compared to other countries in the OECD, especially when the latest 2005 data is included in the analysis.

New Zealand's tariff baskets are far higher than the equivalent in other OECD countries as the graphs above illustrate and are summarized in Table 7 below:

Table 7 : New Zealand Tariffs vs. OECD Averages (NZ$)

Date: Feb 2004	New Zealand	OECD Average	Percent difference
Low User	396	271	+ 46%
Medium User	1,095	675	+ 62%
High User	2,110	1,185	+ 78%

The 2004 data clearly places New Zealand close to the bottom of the OECD league-table. The operators' claim, however, that their new tariffs and packages have superseded the data used to create this ranking and New Zealand's 2005 ranking should improve. However, as is seen below, these claims do not seem to be justified as only New Zealand's low user basket has shown real improvement against the average OECD low user basket. New Zealand's medium and high baskets have not declined at a rate significantly faster than the average OECD medium and high user baskets.

In annual dollar terms, it is clear that New Zealand tariffs have declined between 2004 and 2005. The chart below in Figure 5 shows the least expensive New Zealand tariff for each user basket that is used in the OECD calculations.

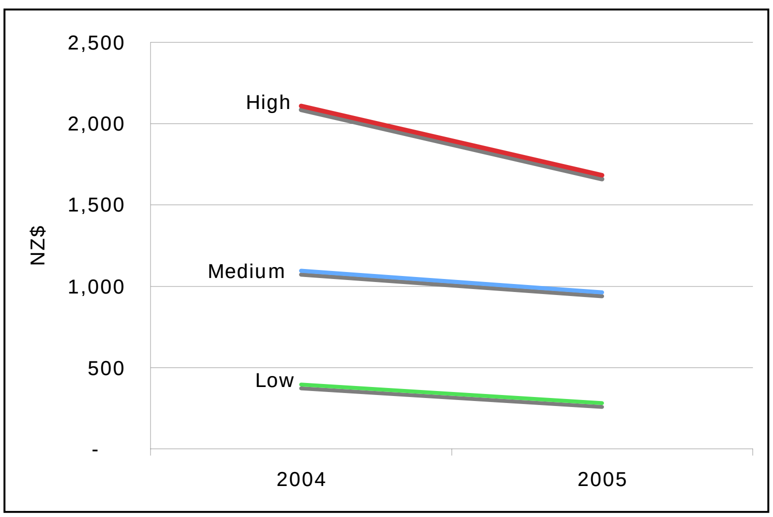


Figure 5 : New Zealand Tariff Changes 2004-2005 (US$:NZ$ 1:1.37)

All three tariff baskets have declined; high by 20%, medium by 12% and low by 29%. While this is a positive trend for consumers, the picture is less than impressive when New Zealand is compared with the average prices across the OECD as shown in the graph in Figure 6 and in Table 8 below.

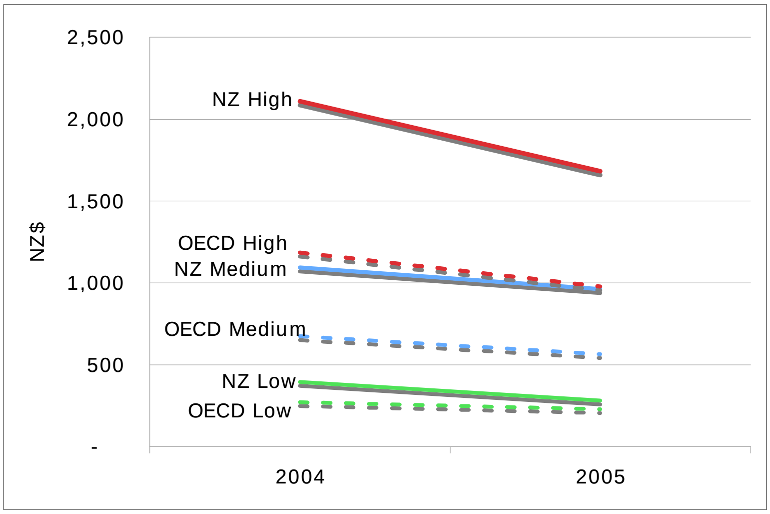


Figure 6 : New Zealand and OECD Average Tariff Changes 2004-2005 (US$:NZ$ 1:1.37)

In annual dollar terms, it is apparent that the changes in tariffs and addition of new products by Vodafone and TCNZ have made a significant impact on the costs incurred for a typical low user basket. With a decline of 29%, this is almost twice the rate of decline of the OECD average of 16%.

Table 8 : NZ Tariffs versus OECD Tariffs

	New Zealand Tariff			OECD Tariff		
	2004	2005	Change	2004	2005	Change
Low User	396	282	-29%	271	228	-16%
Medium User	1,095	962	-12%	675	567	-16%
High User	2,110	1,682	-20%	1,185	978	-17%

This aggressive decline in tariffs does not carry-over to the typical medium or high user basket. For high users, tariffs have fallen by 20%, slightly more than the OECD average while the decline in the medium user basket at 12% has been actually less than the OECD average of 16%.

While New Zealand’s tariffs have been falling roughly in line with the OECD averages, they are still significantly higher tariffs in absolute terms, especially in the case of the medium and high user baskets. For this reason, New Zealand’s placing in the OECD rankings is relatively unchanged.

Relative to the other OECD countries, while the low user basket improves significantly in the rankings from 146% to 123% and the high user basket improves somewhat from 178% to 172%, the medium user basket actually declines in the rankings, from 162% to

170%. The un-weighted, combined ranking improves slightly from 169% to 165%.

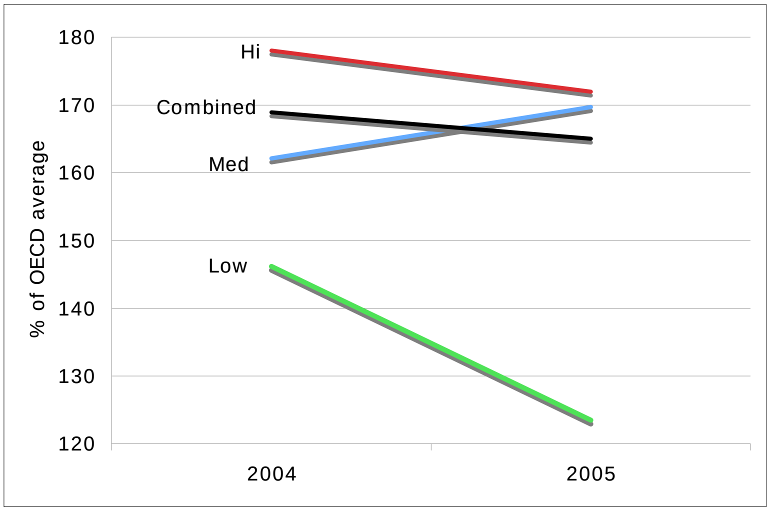


Figure 7 : New Zealand Basket Ranking Relative to OECD Averages 2004-2005

It is important to note that there are two drawbacks to using a combined, un-weighted average of tariff baskets to examine a country's ranking. First, this equal weight does not necessarily reflect the true composition of a country's user base. An operator's customers might be heavily skewed towards low-value, pre-paid users or contain a high percentage of high-ARPU business users.

Secondly, a combined ranking can conceal significant individual basket variations. For example, although the New Zealand combined basket continues to rank at the bottom of the league table using the latest February 2005 data, this conceals the fact that New Zealand's low user basket by itself improves from 28th to 23rd position

It is clear to us that although the New Zealand tariffs are falling in absolute terms, there is little indication, apart from the low user tariff basket, that New Zealand's mobile operators are lowering prices at a rate necessary to align them significantly closer to the OECD averages.

5.4 <u>Basket Sensitivity Analysis</u>

Both Vodafone and TCNZ, in their submissions to the Commission, strongly suggest that the OECD basket methodology contains several limitations and flaws that, as a result, means the output does not present an accurate picture of the state of competition in New Zealand;

> "The OECD evidence is not reliable as an indicator of domestic competitive conditions"
> Vodafone, *Submission on the Commerce Commission Draft*

> *Report on Mobile Termination*, P. 27
>
> "The Commission relied upon a single Ministry of Economic Development (MED)'s telecommunications benchmarking study to draw its conclusions on the relative level of NZ mobile prices. However Telecom considers that this report is seriously flawed for a number of reasons."
> TCNZ, *Submission in respect of the Commerce Commission's Draft Report for its Schedule 3 Investigation into Regulation of Mobile Termination*, P. 50

This section of this report addresses some of the concerns that both Vodafone and TCNZ expressed by adapting various factors in the OECD/Teligen model to create a number of scenarios that seek to more accurately reflect conditions in the New Zealand market, identify areas where New Zealand's tariffs appear high compared to the OECD average and address external exchange rate issues.

We note that if New Zealand's cellular prices are high (in some sense, e.g. relative to incomes), it might be expected that consumption of cellular services would be correspondingly low.

5.4.1 Reduced Basket Size

The most common complaint from the operators was that the OECD low user basket of telecom services is much larger than the average New Zealand residential customer's usage, as illustrated by this excerpt from Vodafone:

> By materially overstating the volumes, the OECD comparisons unduly magnify the price differences between countries. Moreover, since the extent of overstatement varies considerably across countries, the rank order of countries is also distorted.
> Vodafone, *Submission on the Commerce Commission Draft Report on Mobile Termination*, P. 27

To address this issue, we have re-run the OECD model using two reduced sized baskets of calls and SMS to determine how these smaller volumes would affect New Zealand's standing in the OECD rankings.

5.4.1.1 One-Half OECD Low Basket Scenario

This scenario attempts to closer replicate the average calling patterns in New Zealand. By cutting the call volumes in half (from 300 to 150 per year or from 25 to 12.5 per month) and SMS volumes in half (from 360 to 180 per year or from 30 to 15 per month), while leaving all other usage patterns the same, this level of calls and SMS may change New Zealand’s ranking in relation to other countries.

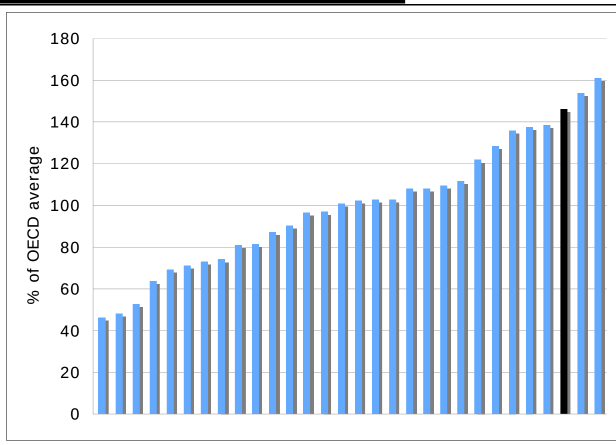
The resulting number of calls and minutes of use is shown in the table below:

Table 9 : One-Half OECD Low Basket: Calls and Minutes per Month and per Annum

	Monthly		Annual	
	Calls	Minutes	Calls	Minutes
Low User	12.5	19	150	228

This scenario was conducted using both the February 2004 data used in the Ministry of Economic Development report and using the most up-to-date information from February 2005.

2004 OECD Low User Basket



2004 One-half OECD Low User Basket

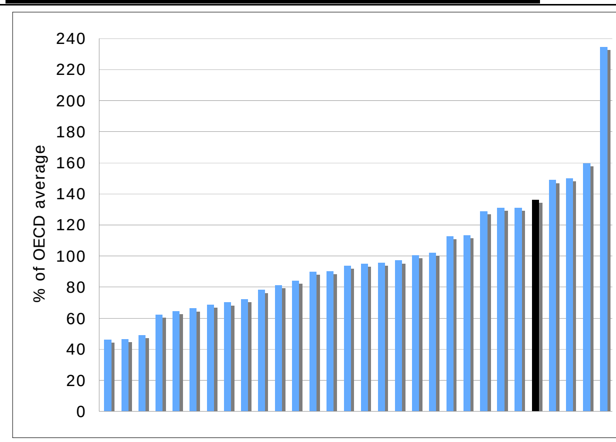


Figure 8 : 2004 OECD Low basket and One-half low basket comparison

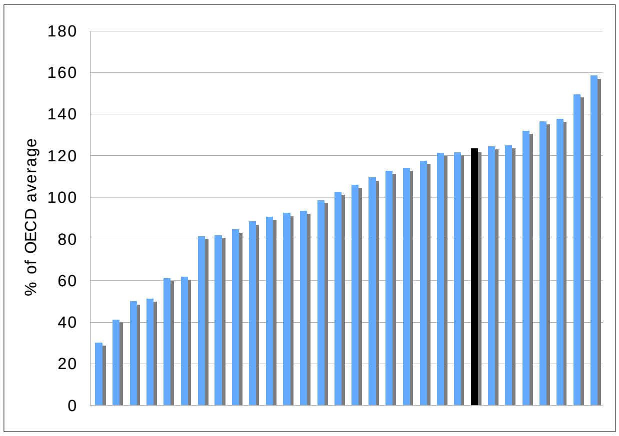
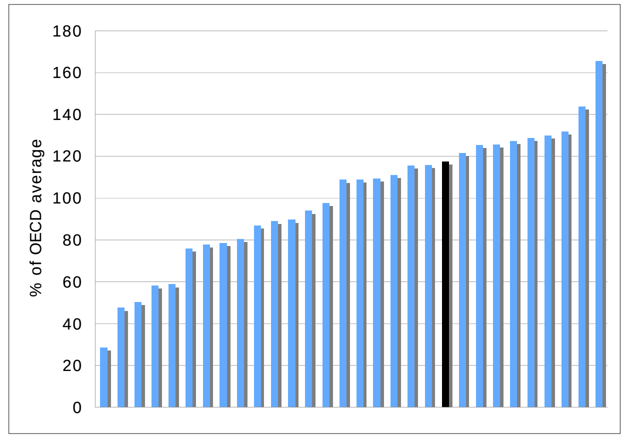
2005 OECD Low User Basket	**2005 One-half OECD Low User Basket**
	

Figure 9 : 2005 OECD Low basket and One-half low basket comparison

As can be seen from the graphs in Figure 9 above and Table 10 below, New Zealand's rankings did improve slightly, increasing two places in both 2004 and 2005. While this is only a modest increase, it could be seen as evidence that the OECD's overstatement of tariff baskets is systematically affecting New Zealand's ranking in the league-tables for very low usage customers.

Table 10 : Comparison of OECD 2004 & 2005 Low basket and One-half low basket

	2004		2005	
	OECD basket	1/2 OECD basket	OECD basket	1/2 OECD basket
Ranking (out of 30)	28	26	23	21
% of OECD average	146	136	123	118

5.4.1.2 One-Quarter Low Basket

Given the slight change in New Zealand's standings above, we decided it would be informative to see if this trend will continue with an even smaller tariff basket. For this scenario, we have taken one-quarter of the standard OECD low tariff basket (or one half of the basket in the scenario above), or 75 voice calls and 90 SMS per annum (6.3 calls, 7.5 SMS per month).

Table 11 : One-Quarter OECD Low Basket: Calls and Minutes per Month/per Annum

	Monthly		Annual	
	Calls	Minutes	Calls	Minutes
Low User	6.3	9.3	76	112

The resulting number of calls and minutes of use is significantly lower than Merrill Lynch's estimate of 147 call minutes per annum and is shown in Table 11:

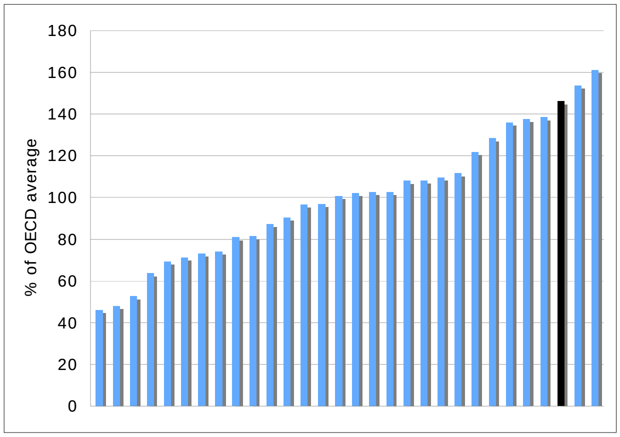
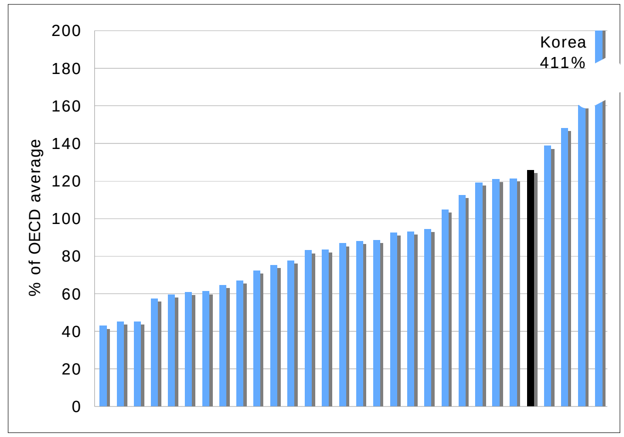
2004 OECD Low User Basket	**2004 One-quarter OECD Low User Basket**
	

Figure 10 : 2004 OECD Low basket and One-quarter low basket comparison

With a very aggressive, one-quarter user basket, there is no change in New Zealand's OECD standings from the one-half basket, though the percentage of OECD average continues to improve.

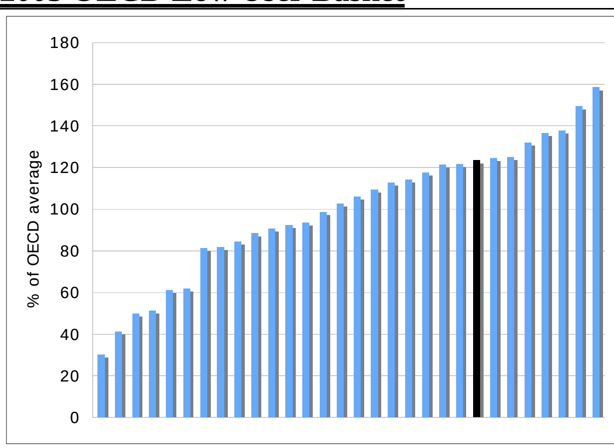
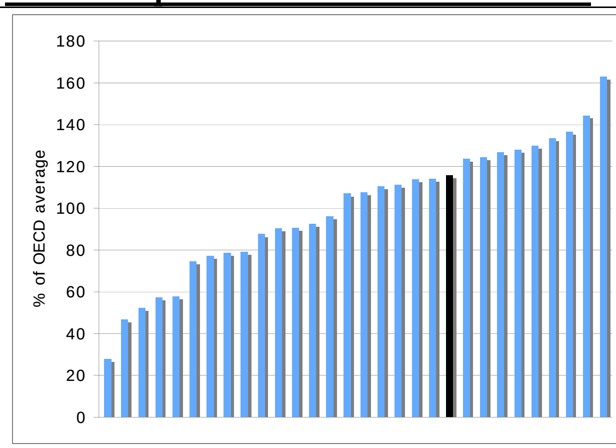
2005 OECD Low User Basket	**2005 One-quarter OECD Low User Basket**
	

Figure 11 : 2005 OECD Low basket and One-quarter low basket comparison

Table 12 : Comparison of OECD 2004 & 2005 Low basket and One-quarter low basket

	2004		2005	
	OECD basket	1/4 OECD basket	OECD basket	1/4 OECD basket
Ranking (out of 30)	28	26	23	21
% of OECD average	146	126	123	116

While continually reducing the size of the low user basket has initially slightly improved New Zealand's overall country ranking and does reduce the tariff compared with the OECD average, two points need to be considered.

Firstly, we believe a user basket with 75 voice calls and 90 SMS per annum (6.3 calls and 7.5 SMS per month) is an artificially low usage basket that is not representative of typical low users. Secondly, as seen in the graph Figure 12 below, the spread in tariffs in each scenario (as a percentage of the OECD average) decreases significantly in 2005. This indicates that recent changes to New Zealand's tariff plans have made the basket costs less sensitive to basket size.

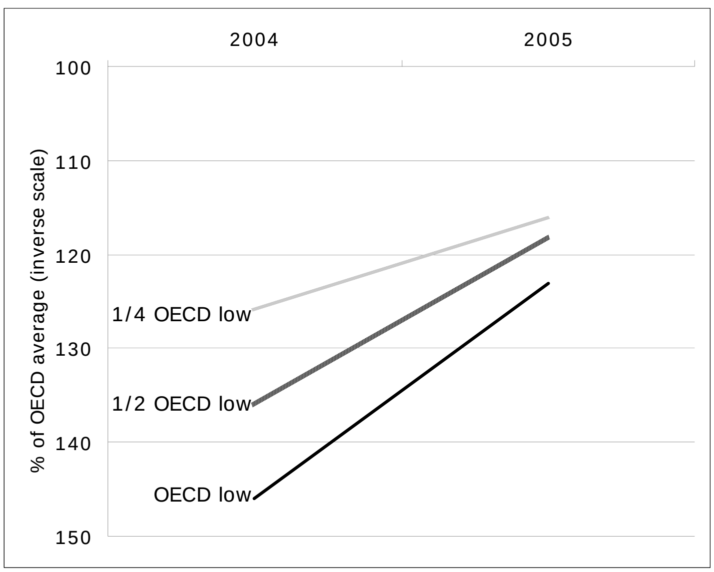


Figure 12 : Change in % of OECD Average Based on Basket Size

Overall, while testing a tariff basket that may be more representative of the typical New Zealand "low" usage customer does increase New Zealand's overall rankings slightly, the change is not significant and therefore we do not believe that the OECD basket sizes represent a fundamental flaw in the OECD methodology.

5.4.2 Calls Only

In trying to determine what elements of New Zealand's tariffs account for its relatively poor performance in the OECD rankings, we have created two additional scenarios that are based on only one product, either just voice calls or just SMS messages. Any significant changes in New Zealand's standing in these scenarios would give an indication as to what service is keeping New Zealand in the bottom quartile of the OECD rankings.

The first scenario uses the standard OECD low basket of 300 calls but in this case, no SMS are included. The scenario is repeated for both 2004 and 2005.

2004 OECD Low User Basket	2004 Voice Only Low User Basket

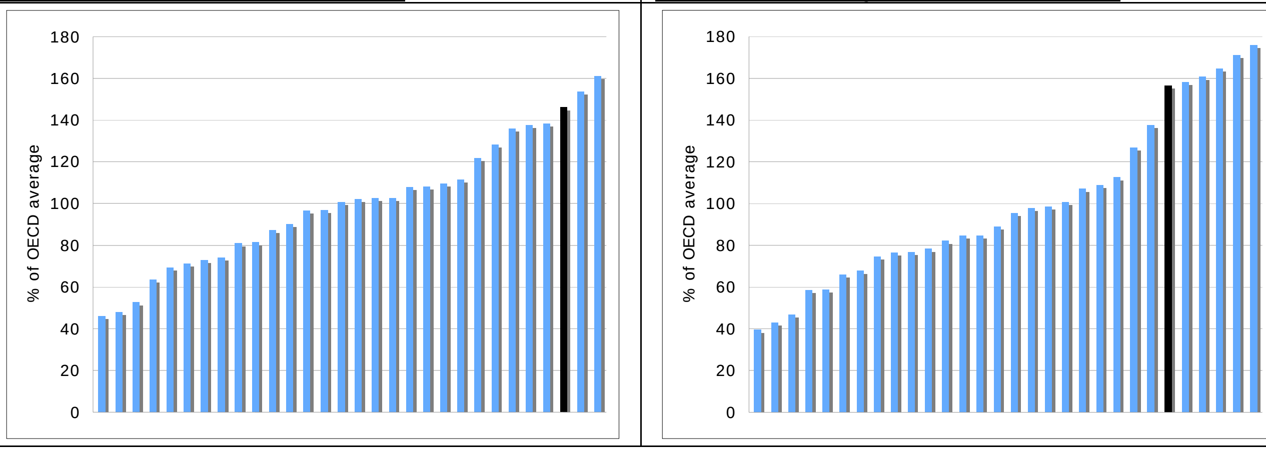


Figure 13 : 2004 OECD Low basket and Voice only basket comparison

2005 OECD Low User Basket	2005 Voice Only Low User Basket

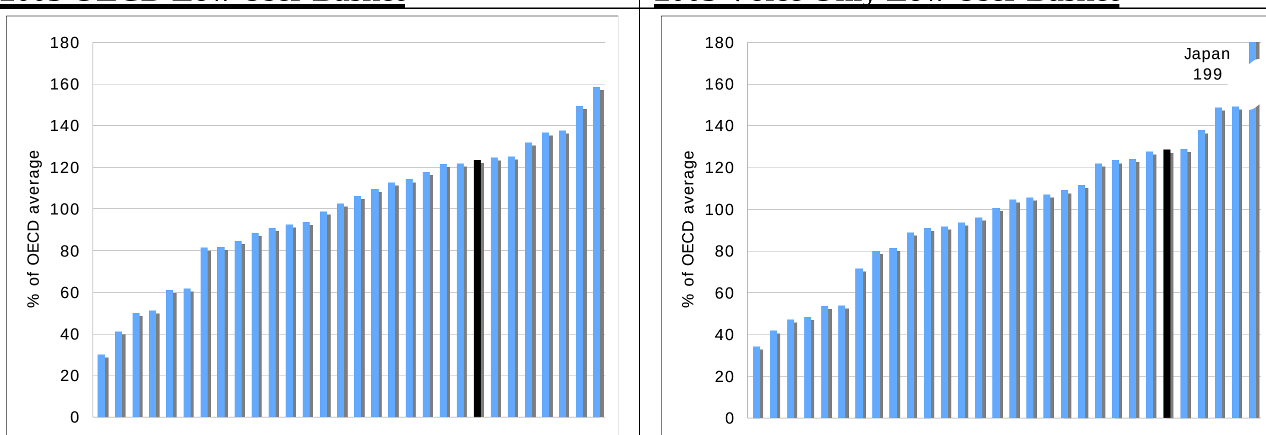


Figure 14: 2005 OECD Low basket and Voice only basket comparison

Table 13 : Comparison of OECD 2004 & 2005 Low basket and Voice only basket

	2004		2005	
	OECD low basket	Voice only basket	OECD low basket	Voice only basket
Ranking (out of 30)	28	25	23	25
% of OECD average	146	157	123	128

Comparing the voice-only user basket in 2004 with the standard low user basket, New Zealand's ranking improves slightly from 28th to 25th position although the basket cost as a percentage of the OECD average actually increased, indicating that voice calls were relatively more expensive in New Zealand than SMS is. However, in 2005, New Zealand's ranking declines from 23rd for the low user basket to 25th for the voice-only user basket. Voice calls are again seen to be relatively more expensive in New Zealand than SMS is, but to a lesser extent than in 2004.

5.4.3 SMS Only

TCNZ indicated in their submission that the introduction of the $10 text plan offers consumers an innovative tariff for up to 500 SMS per month and they stated that a tariff that included a greater number of text messages more accurately represented the typical New Zealand user.

This scenario uses the standard OECD low basket of 360 SMS but no voice calls are included. The scenario is repeated for both 2004 and 2005.

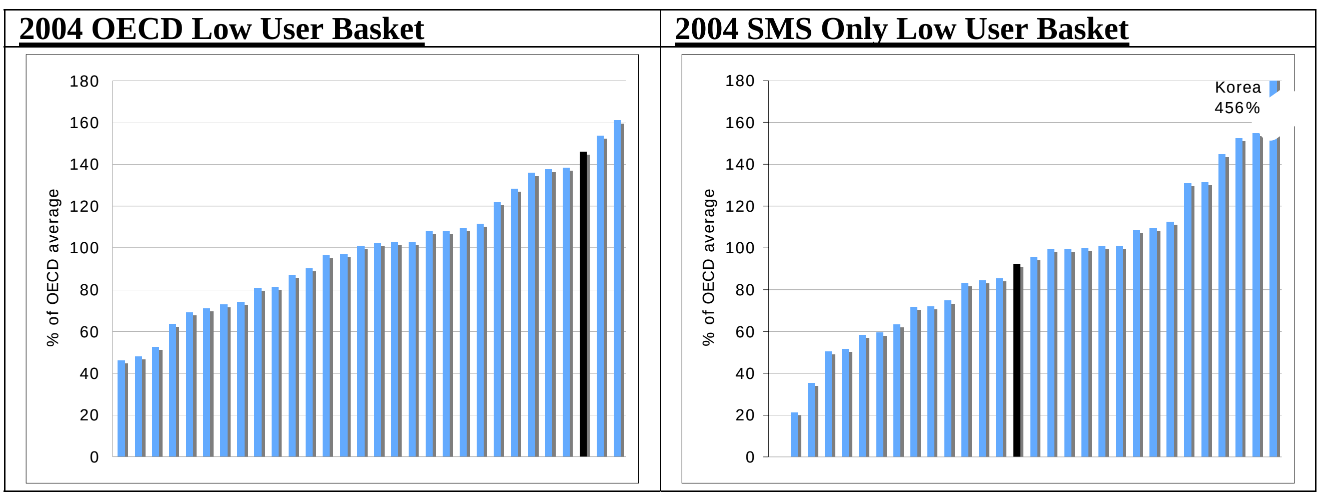


Figure 15 : 2004 OECD Low basket and SMS only basket comparison

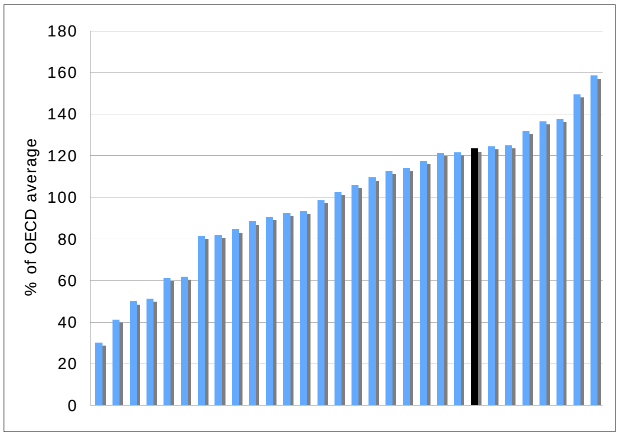
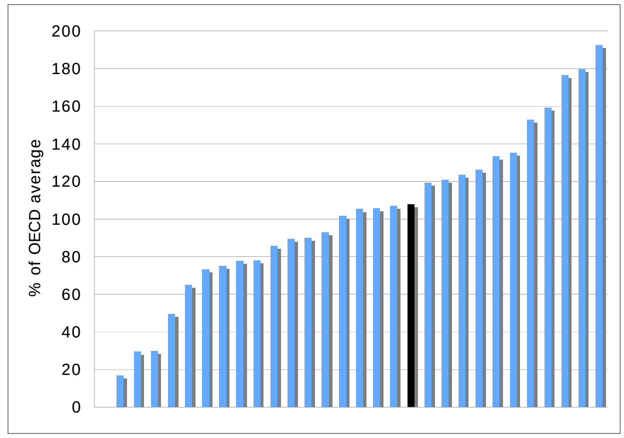
2005 OECD Low User Basket	**2005 SMS Only Low User Basket**
	

Figure 16 : 2005 OECD Low basket and SMS only basket comparison

Using a basket of SMS only makes a significant variation in 2004, with New Zealand's ranking moving from 28th to 15th with the resulting tariff actually less than the OECD average at 92%. By 2005 the improvement is less pronounced with a jump of 4 places in the rankings and an improvement in the tariff to just above the OECD average.

Table 14 : Comparison of OECD 2004 & 2005 Low basket and SMS only basket

	2004		2005	
	OECD low basket	SMS only basket	OECD low basket	SMS only basket
Ranking (out of 30)	28	15	23	19
% of OECD average	146	92	123	108

While using a voice-only or text-only basket is unrealistic, it does give an indication that operators in New Zealand have made progress in bringing the tariffs for SMS closer in line with the OECD average. It is clear that New Zealand operators have moved aggressively to lower the costs of text messages for certain user groups since the Ministry of Economic Development report using the February 2004 data was published. The same cannot be said for the most recent developments for voice call tariffs, with New Zealand's standing actually falling in the February 2005 rankings.

5.4.4 The Status of PPP

Both Vodafone and TCNZ have questioned the conversion rates used to calculate OECD Purchasing Power Parity (PPP) in the OECD model.

> "Telecom also considers that the OECD Purchasing Power Parity (PPP) conversion rate applied by the MED is likely to result in the systematic overestimation of prices in New Zealand relative to the rest of the OECD."

TCNZ, *Submission in respect of the Commerce Commission's Draft Report for its Schedule 3 Investigation into Regulation of Mobile Termination*, P. 50

"PPP exchange rates may not be reliable when dealing with services (as opposed to goods) and highly branded products. A dollar in New Zealand may buy less or more than a dollar's worth of mobile services in other countries. Using a number of alternative exchange rate methodologies is the normal way to account for their difficulties, but the MED presents only PPP comparisons."
Vodafone, *Submission on the Commerce Commission Draft Report on Mobile Termination*, P. 28

Despite the concerns regarding the calculation of PPP, we have found that removing this conversion rate from the model makes very little change in New Zealand's rankings.

Table 15 : Changes in Percent of OECD Basket by Removing PPP

% of OECD average	2004		2005	
	With PPP	Without PPP	With PPP	Without PPP
Low	146	141	123	123
Medium	162	159	170	172
High	178	176	172	176
Combined	169	166	165	168

Both in New Zealand's tariffs as a percentage of the OECD average, and in the overall country ranking of the 30 OECD nations, removing the Purchasing Power Parity conversion does not change any ranking by more than three percent, as seen in Table 15 and Table 16 the graph in Figure 17 below:

Table 16 : Changes in OECD Country Ranking by Removing PPP

OECD ranking	2004		2005	
	With PPP	Without PPP	With PPP	Without PPP
Low	28	27	23	22
Medium	29	30	30	30
High	29	30	29	30
Combined	29	30	30	30

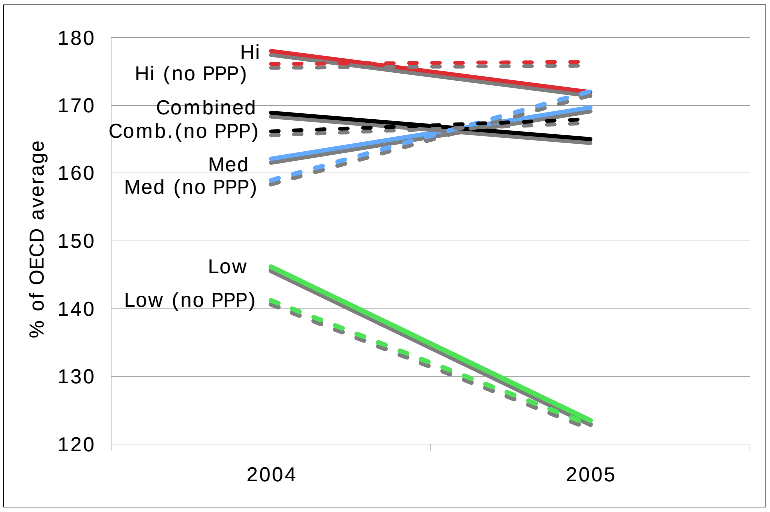


Figure 17 : Changes in Percent of OECD Basket by Removing PPP

5.4.5 The Exchange Rate Issue - Using the 10 Year Average Exchange Rate

As mentioned in the above section on PPP, TCNZ considers the rate applied to New Zealand is likely to result in higher price estimates relative to the other OECD countries. TCNZ goes on to state:

> "Telecom submitted on this point to the Commission during the interconnection pricing hearings, and the Commission accepted this point and modified its pricing methodology as a result in a subsequent benchmarking study for interconnection. If the Commission's revised methodology were to be applied to modify the OECD's PPP exchange rate for New Zealand, services in New Zealand would be about 20 per cent cheaper than currently presented in the benchmarking report 21. The significance of this revision highlights the need for the MED to review its PPP methodology to eliminate what is likely to address these and any other issues."
>
> TCNZ, *Submission in respect of the Commerce Commission's Draft Report for its Schedule 3 Investigation into Regulation of Mobile Termination*, P. 50-51

In September 2002, the Commission published a report (International Benchmarking Report: A Comparative Review of Interconnection Pricing) discussing the issue of currency conversions. While stating that there are a number of advantages to using PPP-based calculations, they also highlighted issues with New Zealand's "persistently high current account deficits":

> "An important drawback of the PPP model is that it does not appear to pick up important real influences on the exchange rate over the medium term. While PPP is useful in explaining long-run exchange rate trends, other factors appear to drive movements in exchange rates around that trend".
>
> Commerce Commission, *International Benchmarking Report: A Comparative Review of Interconnection Pricing*, P. 38

Consequently, the Commission decided that a PPP conversion rate does not provide the most appropriate currency conversion rate for that benchmarking study and, by implication, future ones.

Instead, the Commission turned to using a ten-year historical average of currency exchange rates to calculate currency conversions. We have developed a scenario to take into account this methodology for all 30 of the OECD countries. Shown in Table 17 below is the most recent data used in the February 2005 OECD/Teligen model, including the standard exchange rates, the PPP rates and the a ten-year historical average (calculated from January 1st, 1995 to December 31st 2004).

Table 17 : Comparison of Currency Exchange Rate Methods

	US$	US$ PPP	10-year average US$	Change vs. US$	Change vs. US$ PPP
Australia	0.77500	0.71101	0.65795	-15%	-7%
Austria	1.30359	1.04288	0.86734	-33%	-17%
Belgium	1.30359	1.07735	0.86734	-33%	-19%
Canada	0.80593	0.76755	0.69780	-13%	-9%
Czech Republic	0.04334	0.06772	0.03200	-26%	-53%
Denmark	0.17518	0.11087	0.14872	-15%	34%
Finland	1.30359	0.91802	0.86734	-33%	-6%
France	1.30359	1.03460	0.86734	-33%	-16%
Germany	1.30359	1.03460	0.86734	-33%	-16%
Greece	1.30359	1.29069	0.86734	-33%	-33%
Hungary	0.00531	0.00748	0.00472	-11%	-37%
Iceland	0.01614	0.00966	0.01331	-18%	38%
Ireland	1.30359	0.88081	0.86734	-33%	-2%
Italy	1.30359	1.11418	0.86734	-33%	-22%
Japan	0.00967	0.00658	0.00881	-9%	34%
Korea	0.00098	0.00116	0.00094	-4%	-19%
Luxembourg	1.30359	1.06852	0.86734	-33%	-19%
Mexico	0.09103	0.12643	0.11343	25%	-10%
Netherlands	1.30359	1.05983	0.86734	-33%	-18%
New Zealand	0.71110	0.64646	0.56663	-20%	-12%
Norway	0.15740	0.09899	0.13571	-14%	37%
Poland	0.32125	0.48675	0.27994	-13%	-42%
Portugal	1.30359	1.41695	0.86734	-33%	-39%
Slovak Republic	0.03421	0.05263	0.02680	-22%	-49%

	US$	US$ PPP	10-year average US$	Change vs. US$	Change vs. US$ PPP
Spain	1.30359	1.25346	0.86734	-33%	-31%
Sweden	0.14313	0.10080	0.12384	-13%	23%
Switzerland	0.84140	0.51619	0.70892	-16%	37%
Turkey	0.000001	0.000001	0.00001	597%	353%
UK	1.88612	1.54600	1.59868	-15%	3%
USA	1	1	1	0%	0%

It is clear when examining Table 17, that both the US$ exchange rate, and US$ PPP rate used in the OECD model are higher than the New Zealand ten-year historical average exchange rates. However, this is also true for a number of other countries and because of this, it is unlikely that New Zealand's relative rankings in the OECD tables will change significantly. Indeed, when the scenario is modelled, New Zealand's rankings improve only very slightly in all but the low user OECD basket as illustrated in Table 18.

Table 18 : New Zealand's OECD Rankings Using Different Currency Exchange Rate Methods

Date: Feb 2005	PPP	No PPP	10 Year Ave.
Low	23	22	23
Medium	30	30	28
High	29	30	28
Combination	30[18]	30	27

When comparing the actual tariffs paid by New Zealand subscribers, TCNZ is correct in stating that using a ten year average will reduce prices by 20% over a straight NZ$ to US$ exchange rate and 12% when compared to the PPP exchange conversion rate (as used by the OECD basket methodology) illustrated in Table 19 below:

Table 19 : New Zealand's Tariffs Using Different Currency Exchange Rate Methods

NZ$	PPP	No PPP	10 Year Ave.	Change vs. PPP	Change vs. no PPP
Low	281.98	310.18	247.16	-12%	-20%
Medium	961.86	1,058.05	843.09	-12%	-20%
High	1,681.83	1,850.01	1,474.15	-12%	-20%

Despite this potential reduction in tariffs, as many other countries also see similar or greater variations using an average of ten-year historical exchange rates, New Zealand's

[18] The medium and high user baskets are much larger in dollar terms so the relatively good low user basket ranking is negated.

relative rankings in the OECD standings do not change significantly.

While this calculated reduction in tariffs could be seen as being beneficial, we believe that it is somewhat of a hypothetical exercise as any number of exchange-rate models could be deployed.

5.5 Populating the OECD benchmarking model with real New Zealand data

Vodafone and TCNZ have provided the Commission with real usage data from their customers in New Zealand. We substituted the OECD low, medium and high usage baskets with low, medium and high data from both New Zealand operators.

We should qualify the findings by noting that Vodafone and TCNZ have defined low, medium and high users in different ways. In the time available, we have not attempted to reconcile these different approaches in any way. We have taken the baskets just as they were presented by the operators.

Overall country rankings with these new user figures are shown in Table 20 below:

Table 20 : Country Rankings with Operator Data

	Low	Medium	High	Combined
OECD Basket	23	30	29	30
Vodafone Basket	17	22	30	30
TCNZ Basket	20	28	30	30

The only significant changes occur by using Vodafone's user data, especially on the low and medium user baskets. There are three key factors that contribute to the improved country ranking when using this basket:

- Mobile on-net calls are a higher percentage than in the OECD or TCNZ baskets (on-net mobile calls are, in many tariff plans, less expensive than off-net calls).
- Call durations are lower than the OECD and TCNZ baskets.
- Call volumes are much less than the OECD basket. While TCNZ's call volumes are lower still, TCNZ have included a significantly higher number of SMS.

We do not believe it is appropriate to use the actual usage data for one country to compare that country with others. We believe that users adapt their behaviour to a large degree to the peculiarities of the tariff framework in their country. If certain services are expensive, they are likely to use them less than their counterparts in other countries. Likewise, if certain services are offered at extremely attractive prices, they may use them more. However, if any kind of international comparison is to be made between countries, it cannot be based on the observed usage in only one of the countries to be compared. For example, it is no more valid to use the usage patterns of New Zealand than it would be to use patterns from Denmark or Turkey. International comparisons must be based on a common basket or set of baskets which broadly reflects, as far as possible, usage across all countries.

However, even if actual data from New Zealand is used, despite improvements for both low and medium user baskets, New Zealand remains at the bottom of the OECD rankings for a combined basket. This is because the overall score across all three baskets is the un-weighted sum of the low, medium and high basket costs.

While actual consumption of mobile services may be lower in New Zealand than other countries, these results, along with the other results in our sensitivity analysis, clearly reinforce the conclusion that, when comparing any plausible user basket, across all 30 OECD countries, mobile telecom services are expensive in New Zealand.

5.6 Summary

Having gathered two years worth of data and having tested the sensitivity of the OECD/Teligen model, changing the fundamental composition of the user baskets and having tested a number of different currency exchange scenarios, our conclusion is that none of the possible adjustments create any significant shift in New Zealand's overall place in the OECD country standings.

When actual data from New Zealand is used, despite improvements for both low and medium user baskets, New Zealand remains at the bottom of the OECD rankings for a combined basket.

We believe that this indicates that regardless of how a user basket is defined, what year's data is examined or how currencies are converted, New Zealand's mobile tariffs remain some of the highest in the OECD.

6 ANALYSIS OF MERRILL LYNCH AND CITIGROUP ANALYST REPORTS

This section looks in detail at two analyst reports cited by Vodafone and TCNZ to support their submissions against the results of the OECD benchmarking; one report was produced by Citigroup, the other by Merrill Lynch. We consider that neither of these reports bears the interpretation that the operators have placed on them.

6.1 Citigroup – "Can Mobile Surprise?"

The report "Can Mobile Surprise?" by Citigroup Smith Barney ("Citigroup") dated 22 November 2004 is a review of the mobile markets in Australia and New Zealand, predominantly focusing on Australia. It appears to be the work of two Citigroup analysts based in Sydney and one in Wellington.

6.1.1 Citigroup: Key Points Made

The report is naturally aimed at forecasting the performance of the share prices of the quoted mobile companies active in the two countries, principally Telstra, Singtel (owner of Optus) and TCNZ. TCNZ was the "#1 stock pick" because its growth prospects were thought to be higher than Singtel's or Telstra's. The report does not discuss the relative standing of New Zealand mobile tariffs in comparison with those in other countries.

6.1.2 Citigroup: TCNZ's Submissions

Citigroup was cited twice by TCNZ in the mobile termination debate[19].

TCNZ{9} quoted Citigroup as commenting on the low return on investment earned by New Zealand mobile operators. We cannot find, however, a reference to this view in Citigroup's "Can Mobile Surprise?" report. TCNZ's submission does not mention any Citigroup data or submissions in support of the comment it is supposed to have made.

TCNZ also quoted Figure 28 from the Citigroup "Can Mobile Surprise?" report as evidence that the OECD study was seriously flawed {52}. This table is reproduced below as Table 21[20]. This table features in the Citigroup report as part of a discussion of the extent to which fixed-to-mobile substitution has proceeded and is likely to proceed in different countries. TCNZ said in its submission: "Citigroup's study demonstrates New Zealand mobile voice pricing is on average similar or significantly better than the other

[19] TCNZ's submission of 30 November 2004 (Commission-only)

[20] Citigroup {29}

10 countries included in this study".

Table 21 : Global comparison of mobile voice pricing and mobility premium

Country / Data Year[21]	Mobility Premium	In local currency		In US$		Annual % mob price ∆to reach
		Mob voice yield	Fixed voice Yield	Mobile voice yield	Fixed voice Yield	
US	2.4	0.222	0.093	0.222	0.093	0%
France	2.8	0.196	0.070	0.237	0.085	-2%
NZ	3.2	0.427	0.132	0.278	0.086	-7%
Spain	3.4	0.208	0.062	0.252	0.075	-4%
Portugal	3.5	0.231	0.066	0.280	0.080	-7%
Norway	3.8	1.824	0.481	0.264	0.070	-6%
Australia	4.1	0.497	0.122	0.348	0.086	-14%
UK	4.3	0.152	0.036	0.271	0.064	-7%
Switzerland	6.0	0.697	0.117	0.550	0.092	-26%
Sweden	6.1	2.293	0.376	0.305	0.050	-10%
Germany	7.1	0.335	0.047	0.406	0.057	-10%

Source (as given in Citigroup's report): Regulatory websites & Smith Barney estimates

Citigroup seems to define "yield" as average revenue per voice minute, including international roaming but excluding termination[22].

Although Citigroup describes this comparison as "global" (in the title to the table), it covers only 11 countries, and omits many where the OECD basket is cheaper according

[21] Citigroup does not explain its use of the expression "Data Year", but perhaps it indicates that the data are drawn from a mix of years. This table is the only place in the Citigroup report where the expression occurs.

[22] For example, "To compare Telstra and Optus yields per minute we have excluded Mobile Termination revenue from the analysis. This not only provides a more like-for-like comparison it also provides a better indication of yield per minute for mobile relative to fixed line yields"{15}; "we define mobility premium as the average voice yield for mobile divided by the average voice yield for fixed:

- Mobile voice pricing - This excludes mobile data revenue and mobile data minutes. For all markets, we include international roaming revenue and minutes (typically less than about 5-7% total mobile service revenue), as some of our data sources do not disaggregate this number from domestic voice revenue.
- Fixed voice pricing - This is based on total revenue and total minutes arising (from?) outgoing local, national, fixed to mobile and international calls. We regard all of these call categories as addressable for F2M substitution."{32}

to the OECD comparison.

6.1.3 The TCNZ Submission

In this section, we examine the methodology used by Citigroup and the validity of the submissions raised by TCNZ.

Inspection of the table shows that the New Zealand figure for mobile voice yield is higher than the figures for five other countries (US, France, Spain Norway, UK). It is true that the figures for Spain, Norway and the UK are within 10% of the New Zealand figure, but the figures for the US and France are well below this level (at respectively 20% and 15% less than the New Zealand figure). If TCNZ regards the New Zealand figure as being no worse than "on average similar" to the figures for some of the other countries (when other people might think that a variation of 20% strays beyond the zone of similarity into the zone of significance), it follows that the New Zealand figure is "significantly better" than only three of the countries (namely Australia, Switzerland and Germany): in other words, if TCNZ's concept of "on average similar" encompasses a variation of up to 20% below the New Zealand figure, then New Zealand can only be regarded as "significantly better" than countries with a figure more than 20% above the New Zealand level.

We note that Citigroup has not made a PPP-based comparison of mobile voice yield, partly because such a comparison was not particularly relevant for its purpose, which was to compare the ratio between the mobile and fixed yield in a number of countries (rather than comparing the mobile yield between countries).

The underlying data is not provided by Citigroup, so it is difficult to check their calculations. But even assuming that they are correct, it is possibly misleading for Telecom to claim that the average yield figures contradict the OECD benchmarking results. The two analyses are measuring different things. Citigroup's mobile voice yield is the average revenue per minute, while the OECD results are for the cost of a basket of mobile services. If the average number of minutes per user were the same in all countries, the ranking of the mobile voice yield figures and the OECD basket figures would be about the same (one discrepancy being that the OECD basket includes texts, and another being that it excludes roaming); and the ranking of the mobile voice yield figures and voice ARPU figures would be also about the same (but the ARPU figures provided by Merrill Lynch, for example, have inconsistencies – see Section 6.2 *Merrill Lynch - Global Wireless Matrix* below. As it happens, there is a weak correlation between Citigroup's mobile voice yield and the OECD low user basket, taking both on a plain US$ basis, not adjusting for PPPs, but no correlation between yield and Merrill Lynch's ARPU figures, nor between the OECD low use basket figures and Merrill Lynch's ARPU[23].

Citigroup in passing make an interesting comment (which TCNZ does not quote) on the

[23] The correlations are Basket-Yield 0.7; ARPU-Basket 0.2; ARPU-Yield 0.3.

behaviour of TCNZ and Vodafone in the NZ market {52}:

> *Even though NZ mobile pricing (as calculated using publicly disclosed data from TLS and TEL) is about 15-20% lower than Australia, to date, neither TEL nor VOD NZ appears to have the appetite to offer "large and cheap" bucket minutes to the same degree by some operators in Australia. However, this could all change if a third independent mobile network operator was to enter the NZ market.*

Citigroup rules out the prospect of a third mobile operator entering the NZ market by building its own infrastructure, while not excluding the possibility of entry by a third operator through infrastructure sharing with either TCNZ or Vodafone. The passage quoted suggests that Citigroup believes that the New Zealand mobile market will not be very competitive until a third operator enters.

6.1.4 Overall Summary of the Citigroup Report

Citigroup's calculation of mobile voice yield may be adequate for Citigroup's purpose in analysing the progress of fixed-to-mobile substitution in different countries. However it was not intended to be used for deciding whether New Zealand's mobile tariffs are "on average similar to or significantly better than" those of other countries, and the calculation has certain drawbacks from that viewpoint. In our view, TCNZ cannot rely on Citigroup's report to support its submission about the level of New Zealand mobile prices.

6.2 Merrill Lynch - Global Wireless Matrix

The *Global Wireless Matrix* is a regular analysis of the mobile markets of 46 countries written by in-house analysts at the investment bank Merrill Lynch. *Global Wireless Matrix* is intended as a source of data and analysis for investors and potential investors in cellular operators. It is not intended as a means for comparing the affordability of retail cellular services.

6.2.1 Merrill Lynch: Key Points Made

The *Global Wireless Matrix* has been cited by both Vodafone and TCNZ in the mobile termination debate. Vodafone makes reference to Merrill Lynch's report in its submission[24] to the Commission. Vodafone makes the following points:

> *118. The baskets priced by the OECD bear little resemblance to those*

selected by customers in any country, and seem to be systematically biased relative to average usage. This can be deduced by comparing the cost of the "low user" basket in each of 27 jurisdictions with ARPU data reported by Merrill Lynch (2003). For 23 out of 27 countries, the cost of the OECD's "low user" basket exceeds the ARPU, by an average of 37%. So, the average OECD customer uses significantly fewer mobile services than those contained in the "low user" basket.

119. By materially overstating the volumes, the OECD comparisons unduly magnify the price differences between countries. Moreover, since the extent of overstatement varies considerably across countries, the rank order of countries is also distorted.

At the February 2005 Mobile Termination Conference, TCNZ also cited the Merrill Lynch data. TCNZ asserted that the revenue per minute (RPM) comparisons made between countries in the Merrill Lynch report showed that New Zealand was near the average of all countries compared, and that this contradicted the OECD's findings that New Zealand's cellular services were among the least affordable of those benchmarked by the OECD.

In this section, we examine the methodology used by Merrill Lynch and the validity of the submissions raised by TCNZ and Vodafone.

6.2.2 The Vodafone Submission

Merrill Lynch states ARPU in US Dollars per month. It defines ARPU as monthly service revenues divided by the average subscriber base during a quarter. The company bases its ARPU estimates on data supplied by the operators. Service revenues are defined as retail call revenues, including roaming (although some operators exclude roaming revenues from non-subscribers), plus flat rate retail charges, plus - in some cases - interconnection revenue (i.e. revenues from mobile termination). Merrill Lynch acknowledges that some operators count equipment sales in their ARPU, and that there is no standard definition of an active subscriber, but it does not attempt to normalise the different reporting methods used by various operators. Merrill Lynch states in its report that, where an operator does not separate equipment revenues from service revenues in its public figures, it does not attempt to estimate equipment revenues and subtract them from the total. ARPU is stated on a country basis, using averages across the various operators in each country.

Merrill Lynch states ARPU information for 27 of the 30 countries covered in the OECD survey. Iceland, Luxembourg and the Slovak Republic are excluded from the Merrill Lynch report.

Monthly ARPUs for the OECD countries are shown in Table 22 below:

Table 22 : ARPU data reported by Merrill Lynch

2004 OECD Ranking For Low User Basket Cost Excluding Tax and Including PPP	Country	Monthly ARPU in Q303 as reported by Merrill Lynch (US$)
1	Denmark	32
2	Iceland	Not covered
3	Luxembourg	Not covered
4	Finland	49
5	Ireland	57
6	Mexico	18
7	Norway	49
8	Canada	38
9	Hungary	24
10	Sweden	31
11	Italy	33
12	UK	38
13	Portugal	30
14	USA	58
15	Czech Republic	20
16	Switzerland	61
17	France	40
18	Belgium	40
19	Greece	34
20	Spain	35
21	Netherlands	42
22	Austria	40
23	Germany	30
24	Japan	63
25	Slovak Republic	Not covered
26	Korea	34
27	Australia	40
28	New Zealand	30
29	Turkey	14
30	Poland	20

We disagree with Vodafone’s comparison of the Merrill Lynch and OECD data on the following grounds.

First, Merrill Lynch seeks to include mobile termination revenues in its ARPU calculation, and so its definition of ARPU is not for retail services only. Because mobile termination rates vary across operators and countries, and because the volume of incoming traffic per subscriber varies, it cannot be assumed that the contribution of mobile termination fees represents a uniform proportion of ARPU across all operators.

Second, Merrill Lynch makes no attempt to normalize the varying definitions of ARPU offered by different operators unless the operators make the relevant elements of their financial data public. Merrill Lynch states in its methodology that some operators do not include mobile termination revenues in their ARPU figures, some include equipment revenues while others exclude them, and some include roaming from non-subscribers, while others do not.

Third, Merrill Lynch acknowledges that there is no standard definition of an active customer among operators. This is a particular problem among prepaid customers, who may have taken a particular operator's prepaid service in the past, but may not have used the service for several weeks or months.

Fourth, we believe it is not appropriate to compare the OECD data, which is PPP-adjusted, with the Merrill Lynch data, which is not.

Fifth, and more fundamentally however, we cannot replicate the calculation which Vodafone made when comparing the OECD low user basket costs with ARPUs. Prompted by the large variance between our own calculations and the assertions made by Vodafone, we asked the Commission for clarification from Vodafone on how it made its calculations. Vodafone has subsequently confirmed to the Commission that the calculations on which it based these assertions were incorrect[25].

Table 23 below shows the monthly ARPUs for each country reported by Merrill Lynch, in Table 22 above. These monthly ARPUs are then multiplied by 12 to give annual ARPUs. The next column shows the OECD annual basket cost for low users from 2004, using PPP. The next column shows the low user basket expenditure (with PPP) as a percentage of ARPU. Finally, low user basket costs are shown without PPP, and ARPU is shown as a percentage of these non-PPP figures (a more appropriate comparison since the ARPU data is not on a PPP basis).

Using PPP-adjusted basket prices, the low user basket price exceeds ARPU in only two of 27 cases (Turkey and Poland), not in 23 out of 27 cases as Vodafone asserts. On average, the low user PPP-adjusted OECD basket is 54% of the ARPU value.

Using non PPP-adjusted basket prices, the low user basket price exceeds ARPU in one of 27 cases (Turkey). On average, the low user PPP-adjusted OECD basket represents 48% of the ARPU value.

[25] Email from Hayden Glass of Vodafone to Anthony Morris of the Commission on 29 April, 2005

Table 23 : Merrill Lynch - Monthly ARPUs for each country reported

2004 OECD Ranking For Low User Basket Cost Excluding Tax and Including PPP	Country	Monthly ARPU in Q303 as reported by Merrill Lynch (US$)	Annual ARPU (US$)	PPP-adjusted low user basket price, 2004 from OECD (US$)	PPP-adjusted low user basket as % of ARPU	Non PPP-adjusted low user basket price, 2004 from OECD (US$)	Non PPP-adjusted low user basket as % of ARPU
1	Denmark	32	384	91.32	24%	127.84	33%
2	Iceland	Not covered		95.19		129.45	
3	Luxembourg	Not covered		104.22		115.68	
4	Finland	49	588	125.98	21%	161.25	27%
5	Ireland	57	684	137.13	20%	176.90	26%
6	Mexico	18	216	140.95	65%	101.49	47%
7	Norway	49	588	144.51	25%	206.65	35%
8	Canada	38	456	146.83	32%	142.42	31%
9	Hungary	24	288	160.36	56%	94.61	33%
10	Sweden	31	372	161.13	43%	203.02	55%
11	Italy	33	396	172.76	44%	177.94	45%
12	UK	38	456	178.72	39%	196.60	43%
13	Portugal	30	360	191.06	53%	156.67	44%
14	USA	58	696	191.82	28%	191.82	28%
15	Czech Republic	20	240	199.52	83%	111.73	47%
16	Switzerland	61	732	202.30	28%	299.40	41%
17	France	40	480	203.23	42%	229.65	48%
18	Belgium	40	480	203.31	42%	221.61	46%
19	Greece	34	408	213.77	52%	200.95	49%
20	Spain	35	420	213.90	51%	198.93	47%
21	Netherlands	42	504	216.83	43%	242.85	48%
22	Austria	40	480	220.84	46%	238.51	50%
23	Germany	30	360	241.09	67%	270.02	75%
24	Japan	63	756	253.93	34%	380.90	50%
25	Slovak Republic	Not covered		268.89		104.87	
26	Korea	34	408	272.28	67%	190.60	47%
27	Australia	40	480	273.85	57%	282.07	59%
28	New Zealand	30	360	289.33	80%	271.97	76%
29	Turkey	14	168	304.27	181%	182.56	109%
30	Poland	20	240	318.91	133%	169.02	70%
Average					**54%**		**48%**

Vodafone’s assertion that the OECD low user basket ‘materially overstates’ the volumes of usage is, therefore, by its own admission, incorrect.

Further evidence against Vodafone's submission that the OECD methodology overstates usage is available from examining the monthly minutes of use (MOU) data provided by Merrill Lynch. The company calculates minutes of use by dividing the monthly average of incoming and outgoing minutes in a quarter by the average subscriber base in that quarter, to give an estimate of the total number of incoming and outgoing minutes per subscriber per month.

In the case of New Zealand, there is no publicly available data on the number of incoming minutes, so Merrill Lynch assumes that it is equal to the number of outgoing minutes.

The company's estimate for the total minutes of use for New Zealand for 3Q03 is 148 minutes. This rises to 151 minutes per month for the following two quarters, and then falls slightly to 147 minutes per month for 2Q04. Since Merrill Lynch assumes that incoming minutes equal outgoing minutes, its view of outgoing minutes can be derived by dividing the MOU figures by two. This gives a figure of approximately 75 minutes per month. The OECD medium user basket also assumes 75 minutes of outgoing calls per month. We do not, therefore, believe that the OECD methodology is flawed in this regard.

6.2.3 The TCNZ Submission

Merrill Lynch provides Revenue per Minute (RPM) figures for 26 of the 30 countries compared by the OECD: Iceland, Luxembourg and the Slovak Republic are not covered at all in the report, and RPM data for Belgium is not presented.

Merrill Lynch calculates RPM by dividing voice-only ARPU by minutes of use (MOU). Voice-only ARPU is defined as retail revenues minus equipment revenues and data service revenues plus interconnection (i.e. mobile termination) revenues.

In the Commission’s February 2005 conference on mobile termination, Professor Jerry Hausman, representing TCNZ, said the following when invited by the Chair to comment on the OECD data:

> *CHAIR: I want to be sure to draw Telecom into this conversation. I would like to have a response from you on the observations we've made and Telecom's comments as to where it stands on the OECD price data.*
>
> *PROFESSOR HAUSMAN: I am Jerry Hausman. To start with, I think you might want to look at more current prices. Throughout the industry Merrill Lynch publishes a report called The Wireless Matrix which is widely used. I would like to read you some numbers from it, so these are from the second quarter of 2004. This is a report which was published at the end of the year, last year, it is the latest one I have on my computer.*
>
> *So, this is revenue per minute.*

CHAIR: On PPI basis?

PROFESSOR HAUSMAN: PPI, yes. So, New Zealand is 20 cents. And I don't want to cherry pick the numbers, so I'm going to read you some other countries and I'm going to break it into two parts; countries approximately the size of New Zealand, I may get this wrong seeing as I'm from the United States, and then, secondly, English speaking countries.

Countries approximately the size, Netherlands, 24 cents per minute; Sweden, 22 cents per minute; Norway, 21 cents per minute; Denmark, 17 cents per minute, so that is lower than New Zealand; Ireland, 21 cents per minute; and Portugal, 23 cents per minute.

I have verified the Irish and UK numbers, which I will get to in a second because I have been working for MMO2, which is a large provider in both of those countries, so these are quite accurate.

Let me turn to English speaking countries, the UK which Ofcom have found to be effectively competitive is 22 cents per minute, so it's 10% higher than New Zealand. Then I turn to Australia, home of TelstraClear, the largest mobile provider, I think last I knew they had about a 45% sure in Australia, Australia is 24 cents per minute. So that makes it 20% higher than New Zealand.

So, I'm not saying that this is a perfect source either, any of these things have problems, but before the Commission turns to the OECD, which does have problems and looks only at that, I think they might want to consider this. This is widely available and widely used throughout the cellular industry.

Merrill Lynch says the following:

The RPM figure is not usually disclosed by operators, but we calculate it because we believe it is a good proxy for pricing. RPM also allows us to compare effective prices between operators and between countries, as well as to look at the trend over time, especially as more traffic migrates from fixed to mobile networks.

The full RPM data for the countries covered by the Merrill Lynch report is as outlined in Table 24 below:

Table 24 : Merrill Lynch - Full RPM data for the countries covered

RPM Ranking	Country	Merrill Lynch RPM (US$) for 2Q04
1	USA	0.09
2	Korea	0.09
3	Canada	0.11
4	Finland	0.15
5	France	0.16
6	Mexico	0.17
7	Denmark	0.17
8	Turkey	0.19
9	New Zealand	0.20
10	Ireland	0.21
11	Norway	0.21
12	Czech Republic	0.22
13	Hungary	0.22
14	UK	0.22
15	Sweden	0.22
16	Portugal	0.23
17	Australia	0.24
18	Poland	0.24
19	Italy	0.24
20	Netherlands	0.24
21	Spain	0.25
22	Greece	0.25
23	Austria	0.27
24	Germany	0.31
25	Japan	0.33
26	Switzerland	0.45
-	Iceland	n.a.
-	Luxembourg	n.a.
-	Belgium	n.a.
-	Slovak Republic	n.a.

Having analysed the Merrill Lynch methodology, we agree with Professor Hausman's comments that it is not a perfect source. We believe that the RPM data provided by Merrill Lynch is not a good proxy for the affordability of retail cellular service for the following reasons.

First, Merrill Lynch seeks to include mobile termination revenues in voice-only ARPU calculation, and so its definition of voice-only ARPU is not for retail services only. Because mobile termination rates vary between operators, and because the volume of incoming traffic per subscriber varies, it cannot be assumed that the contribution of mobile termination fees represents a uniform proportion of voice-only ARPU across all operators. Furthermore, in the case of New Zealand and Australia, the operators do not publish their minutes of incoming traffic, and so Merrill Lynch assumes that incoming traffic is 50% of total traffic, while conceding that anecdotal evidence suggests the proportion may be up to 60%.

Second, Merrill Lynch makes no attempt to normalize input data used to calculate voice-only ARPU across different operators unless the operators make the relevant elements of their financial data public. As noted above, there are variations in operators' definitions of their revenues and their active customer bases.

Third, Merrill Lynch excludes (or attempts to exclude where possible) data revenues and traffic from its RPM calculations. However, we believe that data services (especially text messages) represent an important element of service for many cellular users and ought to be included in any calculation of affordability.

Fourth, we believe it is not appropriate to compare the OECD data, which is PPP-adjusted, with the Merrill Lynch data, which is not. For example, we believe it is not reasonable to assume that cellular customers in Japan (where RPM is $0.33) find cellular services less affordable than their counterparts in Turkey (where RPM is $0.19).

6.2.4 Overall Summary of the Merrill Lynch Report

Global Wireless Matrix is a well-researched information source for investors and is widely read inside the cellular industry. However, it is not, nor is it intended to be, a document which benchmarks the overall affordability of cellular services across countries. Furthermore, Merrill Lynch's analysts highlight the inconsistencies in reporting breakdowns in revenues, subscribers and traffic between operators. The report makes use of mobile termination revenues when calculating ARPU and voice-only ARPU, and of incoming traffic when calculating RPM. These facts, together with other inconsistencies in the reporting and analysis of the data, lead us to conclude that the *Global Wireless Matrix* is not suitable for benchmarking retail voice and data service pricing between operators and does not provide a safe basis for taking decisions in this area.

7 SUMMARY OF FINDINGS

1. The OECD mobile tariff comparison methodology is sound.

2. The conclusions which the Ministry of Economic Development has drawn from the OECD tariff comparison, and the Ministry's variations on the OECD figures, are reasonable.

3. Our sensitivity analysis of a wide range of alternative scenarios and assumptions does not disturb the main conclusion that New Zealand is relatively expensive for cellular service, and has been so for some years.

4. The Merrill Lynch revenue/minute figures give a different view, but:
   - The Merrill Lynch figures includes termination revenues;
   - They excludes data revenues (a growing part of the retail market);
   - Different operators report their numbers in different ways (e.g. treatment of international roamers; include or exclude equipment sales), and Merrill Lynch does not attempt to adjust for this;
   - Merrill Lynch makes no attempt to compare the figures on either a 10-year average exchange rate basis or a PPP basis;
   - Merrill Lynch does not say anything about affordability.

5. Citigroup's report does not bear the interpretation which TCNZ has put on it, that New Zealand prices are "on average similar or significantly better than the 10 other countries included in this study". By the standards which TCNZ set, New Zealand prices are significantly better than only 3 of the 10 other countries. But in any event the basis of Citigroup's figures is different from OECD's. Citigroup's report was not intended to be used for tariff comparisons between countries.

6. Vodafone criticised the OECD methodology, but its figures contained a calculation mistake (as Vodafone has acknowledged). Vodafone also complained that the tariff data for New Zealand was out of date. However, we have found that using more up-to-date tariff data does not alter the ranking of New Zealand significantly.

7. Telecom claims there are significant flaws with the MED analysis of the OECD data as it does not take into account the unique purchasing patterns of New Zealanders, fails to measure the extent of mobile penetration and makes no attempt to link penetration to pricing. However, we did not find that adopting even lower usage baskets significantly affected New Zealand's rankings and Telecom provided no real supporting evidence for its other claims.

8. A possible reason for our conclusion that New Zealand is relatively expensive for cellular service is that the capital and operating costs of mobile networks in New Zealand might be higher than elsewhere in OECD. However the operators have failed to produce data to support this case, even though Vodafone at least could easily do so, drawing on its corporate experience as one of the world's largest mobile operators.

9. Another possible reason is that the New Zealand retail market for cellular service might not be competitive enough. TCNZ and Vodafone have failed to establish that the tariffs available on the retail market for cellular service mean that the market is workably competitive.

APPENDIX I

The OECD mobile basket revision of 2002[26]

New OECD Mobile Baskets

1. The new baskets are based on the principles agreed in the Mobile Basket Workshop in London in October 2001, where representatives from a large number of OECD countries, regulators and operators were present.

2. The baskets outlined in this document is based on averages or summaries of the information provided by the representatives at the October 2001 meeting, and others responding to a call for information from the OECD.

3. All baskets will include:

   - Registration or installation charges with 1/3 of the charges, *i.e.* distributed over 3 years.

   - Monthly rental charges, and any option charges that may apply to the package, or package combination.

4. The three new baskets are:

   - Low user basket. The usage level of this basket is low, with a call volume less than half of that in the Medium user basket.

   - Medium user basket. This basket will have 75 outgoing calls per month.

   - High user basket. The usage level is about twice the Medium user basket.

5. The usage profiles will also include a number of SMS messages per month.

[26] *OECD Mobile Basket Revision - A Revision of the OECD Mobile Telephony baskets, based on information received at and after the OECD/Teligen meeting on the mobile baskets in October 2001*, DSTI/ICCP/TISP(2002)9, dated 3 July 2002

6. Call and message volumes for each basket are:

	Outgoing calls /month	SMS per month
Low user	25	30
Medium user	75	35
High user	150	42

7. The information received showed that there is little difference between the average pre-paid usage and the low user post-paid usage. The low user basket can therefore be used for both pre- and post-paid tariffs, allowing a simple comparison also between the two types.

8. Only national calls are included in the profiles, with 4 different destinations:

   – Local area fixed line calls. This is used to accommodate the tariffs that have separate charges for the local area. When such charges are not available, this proportion of calls is included in the National.

   – National fixed line calls. This covers all fixed line calls outside the local area, except in cases as noted above.

   – Same network mobile calls (On-net). This includes all calls made to mobiles in the same mobile network as the caller.

   – Other network mobile calls (Off-net). This includes calls to all other mobile networks in the caller's country. When the charges are different depending on destination network, the market shares based on subscriber numbers are used for weighting the charges. Up to 3 other networks will be considered in each country.

9. Distributions per destination for each basket are:

% of total number of calls	Fixed Local area	Fixed National area	On-net mobile	Off-net mobile
Low user	28.0%	14.0%	40.0%	18.0%
Medium user	24.0%	12.0%	43.0%	21.0%
High user	26.0%	14.0%	42.0%	18.0%

10. As the information received produced little evidence on the split between local and national fixed line calls, the assumption has been used that the ratio would be 2:1 for local:national, i.e. 67% local and 33% national. This

assumption is taken from the averages in fixed baskets, and the scarce information received.

11. Instead of splitting time and day into distinct times and days the following approach will be used:

    – Peak time calls at weekdays, most expensive time during daytime.

    – Off-peak time calls at weekdays, cheapest time before midnight.

    – Weekend time calls, at daytime Sundays.

12. Distributions over time and day for each basket are:

% of total number of calls	ToD Peak	ToD Off-peak	ToD Weekend
Low user	38.0%	35.0%	27.0%
Medium user	47.0%	30.0%	23.0%
High user	63.0%	22.0%	15.0%

13. There will be 3 separate call durations:

    – Local and national fixed line calls

    – Same network mobile calls (On-net)

    – Other network mobile calls (Off-net)

14. Call durations for each basket are:

Minutes per call	Dur Fixed National	Dur Mobile On-net	Dur Mobile Off-net
Low user	1.6	1.4	1.4
Medium user	2.1	1.9	1.9
High user	2.2	2.0	2.1

15. Any call allowance value included in the monthly rental will be deducted from the usage value once the basket is calculated. The deduction cannot be larger than the actual usage value, i.e. negative usage is not allowed. No transfer of unused value to next month is taken into account.

16. Any inclusive minutes will be deducted from the basket usage before starting the calculation of usage cost. The inclusive minutes are assumed to be used up with the same calling pattern that is described in the basket, i.e. the same peak/off-peak ratio and the same distribution across destinations. Where the inclusive minutes are clearly limited to specific destinations or times of day this will be taken into account. No transfer of unused minutes is taken into account.

17. Any inclusive SMS-messages will be deducted from the basket before starting the calculation of the SMS message cost, up to the number of messages in the basket.

18. For each of the operators covered a set of packages shall be included so that the cheapest package offered by that operator can be calculated for each of the 3 baskets.

19. Multiple operators in each country shall be included, with at least the two operators with highest number of subscribers in each country. The operators included shall have a total market share of at least 50% based on subscriber numbers.

20. Basket results are calculated for a period of one year.