
# The Development and Implications of Free ISPs in New Zealand

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## Abstract

The New Zealand telecommunications experience illustrates the process of competition in a market for network services, characterised by technological change and minimal regulation. The story of free ISPs is merely one episode in the battle of Telecom and Clear for the New Zealand telecommunications market. It was enabled by a complex combination of regulation, contractual choices and an unanticipated surge of the Internet. Despite certain static inefficiencies, the free ISPs have brought a considerable number of dynamic efficiencies that should be taken into account when evaluating New Zealand's light-handed policy regime in this industry.

* The author acknowledges the comments of Prof. Lewis Evans.

**CONTENTS**

## LIST OF FIGURES

# 1 Introduction

During the 1990's the face of communication was changed with the advent of new technology providing new uses, as well as different applications of old uses (eg voice communication). The growth of the Internet, in particular, between 1994 and 1999 took many players by surprise. Internet growth has shown a pattern of at least doubling traffic each year[1]. These changes increased competition and a need for networks to interact. Such has been the speed of change that its effect was not for any player to anticipate. The free Internet Service Provider (ISP) in New Zealand is an example of the dynamics at work in the telecommunications industry. Essentially an episode in the battle of the Telcos[2], the free ISP tells the story of regulatory constraints and contractual choices in a rapidly changing technological environment.

As the free ISP model has had a serious impact on the demand for Internet services and is likely to have affected competition in the PSTN[3] market, it is most useful to have a closer look at the development of this model and analyse its exact implications. By not only studying economic theory but also analysing the free ISP experience in the OECD's first member country to fully deregulate its telecommunication market, i.e. New Zealand, we can gain insight in the model and learn valuable lessens about dynamics in lightly regulated industries in general and telecommunications in particular. *Section 2* gives a short history overview of the developments in New Zealand.

Several theories about free ISPs have been advanced. An often-heard explanation for the existence of free ISPs is based on the revenues stemming from advertising and sales commissions from online commerce. While these revenue sources do indeed explain the existence of free ISPs in the United States and Australia, they cannot account for the emergence of free ISPs in New Zealand in the course of 2000. Theories much more applicable to the New Zealand situation argue that interconnection charges between telecommunications operators are the main source of revenue for free ISPs. Much of the

[1] Claims of doubling traffic every three to four months were frequently heard over the two-year period 1995-6. See Coffman and Odlyzko (2001).
[2] "Telcos" is a term often used (especially in the media) to indicate telecommunications operators.

literature on this topic has been based on the work of Laffont, Rey and Tirole (1998). The main idea is that, as free ISPs generate much extra one-way traffic from one network to another, they generate extra termination revenues for the network they are operating on. This in turn will give the telecommunication operator who owns the network an incentive to stimulate the existence of free ISPs by offering them part of the extra revenues. These and other explanations for the development of free ISPs derived from economic theory are elaborated in *Section 3*.

The fact that New Zealand is the first OECD member that fully deregulated its telecommunications industry and that it is a country in which free ISPs have emerged, (shortly) lived, and gone out of business again, makes it the perfect case study to analyse the development and implications of the free ISP market. In order to fully understand the chain of events that occurred within the telecommunications industry in general, and the free ISP market in particular, it is of great importance to understand the New Zealand specific circumstances. *Section 4* analyses the New Zealand case from a strategic point of view against the background of New Zealand's regulatory environment. First, it looks at the information asymmetries faced by the two major telecommunications operators (Telecom and Clear) and the contractual choices that followed. It then studies the impact of the Kiwi Share Obligations and the legal uncertainty stemming from New Zealand's competition policy on those choices, and explains the emergence of free ISPs from there. Taking a closer look at the relevant market structure and the conduct of its main players reveals that the emergence of free ISPs in New Zealand was merely an episode in the battle of the Telcos.

To understand the possible *implications* of free Internet access, it is necessary to analyse performance data including customer numbers, Internet usage, and market consolidation. In addition, both static and dynamic efficiency effects need to be assessed and compared. *Section 5* takes a closer look at the required data, analyses the various efficiency effects, and examines the possible implications of free ISPs in New Zealand (and to a certain extent in other countries). Finally, based on the information gathered throughout Sections

[3] Public Switched Telephone Network.

3, 4, and 5, *Section 6* draws conclusions on the development and implications of free ISPs in general, and free ISPs in New Zealand in particular.

# 2 Historical overview of the ISP market in New Zealand

In order to draw an accurate picture of the development of free ISPs in New Zealand, we first need to take a closer look at the context in which it took place. This historical overview will first give a general description of the New Zealand telecommunications industry, including a detailed illustration of the ISP market and the interconnection dispute between Telecom Corporation of New Zealand Ltd (Telecom) and Clear Communications Ltd (Clear). Building on Enright (2000), we can distinguish four different stages in the development of Internet growth in general, and ISPs in particular, in New Zealand until 1999. Data on key events in the evolution of ISPs from 1999 onward is based on a publication of the New Zealand Ministry of Economic Development (2001) and various news archives. As we are particularly interested in the free ISPs, the first of which emerged in February 2000, we will focus on the latter period[4].

## 2.1 Impression of the New Zealand telecommunications industry

### *2.1.1 Recent history of the telecommunications industry*

In the late 1970s and early 1980s New Zealand's economic management and performance was increasingly criticised. A period of economic reform followed that focused on the removal of protection and the development of competitive markets. The New Zealand Government at that time was of the opinion that private ownership could provide a better ongoing basis for the efficient operation of enterprises in industries as telecommunications, airlines, railway and banking. Specifically, the aim for the telecommunications industry was: "[…] to improve the industry's economic performance and increase consumer benefits by creating competitive, open entry telecommunications markets supported by general competition law"[5]. The result was that in 1987 the New Zealand Post Office – which until then had had a statutory monopoly in the provision of public telecommunications services in New Zealand - was split up into Telecom Corporation of New Zealand Ltd (Telecom), Post Office Bank Ltd, and New Zealand Post Ltd. Telecom was privatized in 1990, when it was sold to wholly owned subsidiaries

[4] For an extensive overview of the history of Internet growth in New Zealand, see Enright (2000).

of Bell Atlantic Corporation and Ameritech Corporation for NZ$4,250 million. A year later, it issued shares to the public and was listed on the New Zealand, Australian and New York stock exchanges[6].

### *2.1.2 Regulation*

On 1 April 1989 New Zealand became the first member of the OECD to introduce full competition to all sectors of the telecommunications industry. According to the Ministry of Commerce (1995), the Government opted for a light-handed regulatory regime that relied, for enforcement, upon private legal actions together with a generic competition law enforcement body. Specifically, the regime relied upon private negotiations between competitors of the integrated natural monopoly to secure interconnection agreements subject to existing competition policy, in particular the 1986 Commerce Act. The Commerce Act established the Commerce Commission and provided New Zealand with regulation on restrictive trade practices, mergers and takeovers, and price controls. Important sections for the purpose of our analysis are S.27, that prohibits contracts, arrangements, or understandings that substantially lessen competition, and especially S.36, which up till 2001 dealt with so-called use of dominant positions (see Appendix B).

The Kiwi Share Obligations are a contractual agreement between the Crown and Telecom, established when Telecom was privatized in 1990[7]. According to the 1990 Kiwi Share Obligations, Telecom was required to:

- Maintain a local free calling option for ordinary residential telephone service;
- Charge no more than the standard residential rental for ordinary residential telephone service; and
- Continue to make ordinary residential telephone service as widely available as at 1 November 1989.

Until 2001, the telecommunications industry did not have an industry-specific regulator. The advantages were thought to be cost savings, allowing concentration of expertise in

[5] Ministry of Economic Development (2001).
[6] Telecom (2002).

the Commerce Commission, and allowing the development of precedents through the Court system, thereby promoting consistency of approach between industries. The 1987 Telecommunications Act only provided for regulations concerning information disclosure and international services, as well as access to land and cable facilities.

### *2.1.3 The Clear / Telecom dispute and interconnection agreements*

Clear entered the market for long-distance calls in 1991, when it experienced few difficulties in entering into an interconnection agreement with Telecom, and eventually succeeded in capturing approximately 20 percent of that market[8]. However, entry to the local call market was more complicated because Clear and Telecom could not agree on interconnection terms. Eventually, after several attempts to negotiate an interconnection agreement with Telecom and in the absence of an industry-specific regulator, Clear addressed the High Court of New Zealand, alleging that Telecom's pricing demands breached S.36 of the Commerce Act. Telecom's main defence for its demanded access prices was the Baumol-Willig rule or the Efficient Component Pricing Rule, which said doing so was economically efficient[9]. This required Clear to pay the full opportunity cost of traffic taken from Telecom, including foregone profit.

In December 1992, the High Court held that the interconnection terms finally offered by Telecom did not breach S.36, adding that the disputed interconnection pricing rule was more likely than the alternatives to improve efficient competition in New Zealand telecommunications. A year later, the Court of Appeal revised this decision and ruled in Clear's favour, stating that Telecom could not lawfully charge an interconnection price that included a component of monopoly rents. Telecom in turn appealed to New Zealand's final appellate Court, the Judicial Committee of the Privy Council, which released its decision in October 1994. It concluded that use of the Baumol-Willig rule by Telecom was not unlawful under S.36 of the Commerce Act and would allow Clear to

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[7] Ministry of Economic Development (2001)
[8] Carter and Wright (1999).
[9] The Efficient Component Pricing Rule states that the appropriate access charge by the bottleneck monopolist to the providers (actual or potential) of a complementary product or service, which the monopolist also produces (and thus the other providers are rivals to the monopolist), is a fee equal to the

compete out over time any monopoly profit obtained by Telecom. In addition, it held that Telecom was not acting anti-competitively and that it had not been established by Clear that it had been prevented from entering the market. Telecom and Clear finally signed an interconnection agreement in March 1996. The agreed interconnection charges were the following:

- Clear would pay Telecom 2 cents per minute for each local call originated on Clear's network terminated by Telecom;
- Telecom would pay 1 cent per minute (rising gradually to 2 cents per minute by the year 2000) for each local call originated on Telecom's network terminated by Clear;
- There would be a 75 percent discount for off-peak calls; and
- Clear would pay Telecom an additional charge of 1 cent per minute[10].

According to Telecom: "[…]The Telecom/Clear 1996 ICA was used as a starting point for later agreements, and the pricing clause for local interconnect call termination was repeated in other agreements" [11]. Specifically, the agreements with Telstra (Nov. 1996), Saturn (June 1997), and Compass (Sept. 1998) concerned local interconnect traffic. Typical local telephone interconnection charges charged by other providers to Telecom usually looked like the following schedule, which is comparable to the charges agreed upon between Telecom and Clear.

Shortly after signing the interconnection agreement with Telecom, however, Clear contended that Telecom's volume toll discounts were in breach of S.36 (use of dominance[12]) in the Commerce Act. According to the New Zealand Herald, Clear held approximately 15 percent of amounts due since February 1997, which exceeded $20 million mid-1999 and an alleged $30 million at the time the new interconnection

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monopolist's opportunity costs of providing the access, including the foregone revenues from a concomitant reduction in the monopolist's sales of the complementary component. Economides (1995).

[10] These additional charges were described as 'costs incurred because of the Kiwi Share requirements' by Clear and as 'a contribution to fixed and common costs of the Telecom local network' by Telecom.

[11] Telecom (2002).

[12] See Appendix B.

agreements were signed (October 2000). In 1998, the Court of Appeal reaffirmed that Clear could withhold payments until judgment was delivered[13].

**FIGURE 2.1** INTERCONNECTION CHARGES CHARGED TO TELECOM[14] IN 1998

| For Agreement Period | Peak (c/m) | Off-peak (c/m) |
|---|---|---|
| Year 1 | 1.00 | 0.25 |
| Year 2 | 1.25 | 0.3125 |
| Year 3 | 1.50 | 0.375 |
| Year 4 | 1.75 | 0,4375 |
| Year 5 | 2.00 | 0.50 |

*Source: Ministry of Economic Development (1998)*

### *2.1.4 The 0867 access package*

In August 1999, Telecom introduced its 0867 access package, in order to "separate Internet traffic from traditional voice calls in order to improve the network management of Internet traffic"[15]. As implemented, it entailed three facets[16]:

1. establishing an identifying number code for Internet users (0867 access);
2. encouraging users to migrate to this code by charging per minute above a limited free monthly access for seven-digit number calls; and
3. excluding 0867 calls from the interconnect termination payments regime.

There was (and still is) disagreement about the legality of Telecom's 0867 package (see Section 4.3). Finally, in May 2000, Telecom and Clear reached an agreement on the 0867 Internet number range. The Commerce Commission is still pursuing a court case against Telecom for its 0867 access package.

[13] The New Zealand Herald (1999).
[14] Note that some interconnection agreements were for shorter terms, i.e. less than 5 years.
[15] Telecom (1999).
[16] New Zealand Institute of Economic Research (2000).

## 2.2 An illustration of the ISP market

An Internet Service Provider is defined as an entity that provides access to the Internet as its primary function. Internet access services are very similar to the more traditional telephone and data communication services provided by telecommunication service providers[17]. Basically, ISPs sell Internet access and other related telecommunications services through bandwidth leased from a data communication network – in New Zealand, that could be Telecom, Clear, Saturn, or other providers. They then repackage this into amounts usable by individuals and companies. Hence, Internet access through either dial-up or high-speed data connections is a repackaging of the leased bandwidth, and has become a sub-market within the telecommunications industry.

The ISP market structure is characterized by a high degree of contestability, low switching costs for consumers, and a low degree of product differentiation. According to Enright (2000), the ISP market has low barriers to entry, as all that is required to start an ISP company is an Internet server ($5,000 to $20,000) and leased bandwidth. In addition, it is easy to adjust costs as required, since the leased service can be paid for monthly. We would therefore expect many competitors in the market, which is indeed confirmed by the data in Enright (2000). Switching costs for consumers are low, as changing ISPs only requires the customer to pay a connection fee to the new ISP, obtain a new email address and install some new software. It should be noted that switching costs may be higher for some business customers due to the inconvenience of changing email addresses, but this may be avoided by purchasing a domain name. Finally, there appears to be little product differentiation. Even though services can be differentiated in response to the needs of customers (different price levels for a different degree of speed of operation, consistency of access, technical support etc.), most ISPs offer roughly the same Internet access packages, reflecting the fact that ISPs are the conduits for communication, not the originators of demand.

*Figure 2.2* shows the relations between the various actors involved in the provision of Internet access, applied to the New Zealand market. The basic idea was that an end user

[17] Enright (2000).

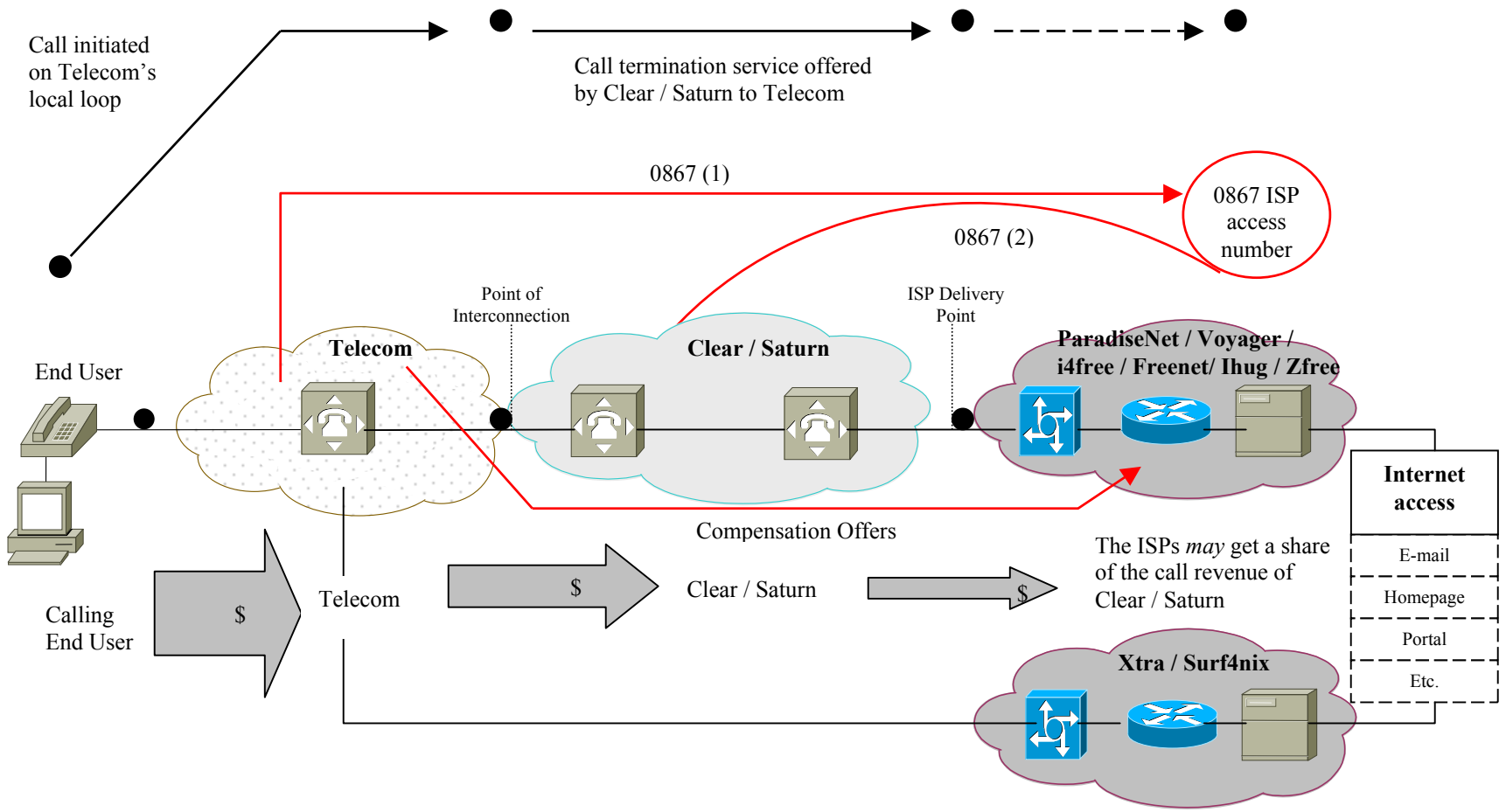
called in from the Telecom network, after which the call was redirected to the ISP of choice. Calls of Xtra customers could be redirected within the Telecom network (as Xtra operates on the Telecom network), whereas calls to ISPs operating on other networks first had to be transferred to those networks before they could be redirected to the appropriate ISP. Here lies the main source of revenue for ISPs operating on other networks than Telecom's. It is agreed upon in interconnection agreements between operators in the telecommunication industry that the operator who terminates a call that originated on another network charges this other network for terminating that call. As New Zealand's telecommunication regulations require Telecom to offer free residential local calls, most calls tend to originate on the Telecom network. This gave other operators like Clear and Saturn the incentive to stimulate ISPs operating on their networks because they would generate much one-way traffic originating on the Telecom network for which Clear and Saturn could charge termination payments. Most ISPs operated on either one of these two networks and signed contracts with them that determined they (the ISPs) got part of the termination revenue per minute of generated traffic.

Another possible source of revenue stems from online advertising and sales commissions through email, homepages, portals and similar services. However, as these activities do not belong to the core business of ISPs (providing Internet access) and mainly depend on web browser and email *applications* and demand for such services (that the ISPs themselves cannot influence), they are unlikely to account for the bulk of ISP revenues unless a substantial critical mass is reached – something which is not likely to happen in New Zealand because of its small population.

The 0867 access package basically tried to force ISPs to buy a 0867 number from Telecom, that their customers had to call in order to reach them (line "0867 (1)" in *Figure 2.1*). Either by negotiations with other operators on the issue (Clear and Telecom reached an agreement in May 2000) or by direct compensation offers (an alleged compensation payment was made to Ihug[18]), Telecom tried to transfer all data traffic to

[18] The Internet Society of New Zealand (2000).

**FIGURE 2.2** BASIC TERMINATION MODEL APPLIED TO THE NEW ZEALAND CASE




*Adapted from Arcome (2000) in: Chambouleyron (2002)*

their 0867 number range. However, because the ISPs had interconnection agreements with Clear and Saturn and consequently operated on their networks, the calls to the ISPs had to be forwarded to those networks first before they could finally be redirected to the appropriate ISP (line "0867 (2)" in *Figure 2.1*). Although the 0867 package may be legally controversial, in terms of competition law, it has enabled analysts to study data traffic and voice traffic separately. This puts New Zealand in a unique position, as most other countries, including the United States, cannot differentiate between voice and data traffic because there is no special number range for data traffic and all calls use the same telephone lines. The learning effects from the New Zealand experience may therefore be of wide interest and applicability.

## 2.3 Chronological overview of key events in the ISP market

### *2.3.1 The period 1987 - 1999*

The period marked as *Stage 0* by Enright represents the pre-commercialisation era, in which mainly academics and hobbyists accessed the Internet. Universities, polytechnics, and co-operatives were principally motivated by the need to provide Internet access for their staff and students or other community members. Internet services in New Zealand were also provided by offshore organisations like Microsoft, CompuServe, IBM Global Networks and Voyager[19]. Enright (2000) reports price competition wasn't fierce at that time. Instead, most variation was due to differentiation based on service. Demand for Internet service through this period was small but growing steadily.

*Stage 1* describes the period between mid-1996 and December 1997, characterised by the commercialisation of the Internet. At the start of 1996, there were more than 30 ISPs in New Zealand, most of which served regional markets while Voyager, CompuServe and IBM served the national market. Commercialisation led to increased price competition, which was strengthened by the entrance of Xtra in May 1996. Xtra, launched by New Zealand's largest telecommunications operator Telecom, could benefit from economies of scale and scope and was able to cut its rates by 50% in August 1996 and its 0800

[19] Voyager was started as a joint venture between OzEmail and two New Zealand entrepreneurs, with OzEmail providing most of the Internet access expertise (it has the second largest subscriber base in Australia. Currently, OzEmail owns 100% of Voyager.

access prices to $1/hr below Voyager. Consequentially, many smaller regional ISPs exited the market and the ones that were able to maintain their presence faced heavily declining market shares: these include IBM and CompuServe, who started concentrating on the business customer segment. In November 1996, Clear Communications, New Zealand's second largest telecommunications service provider, launched its own ISP, called ClearNet. Although also benefiting from economies of scale and scope, ClearNet had a different approach than Xtra, initially focussing on large business customers and basing its pricing strategy on peak service demand times. Around the time of Xtra's entry, iHug was the first ISP to offer a flat rate service, backed by bandwidth it had obtained from sources outside of New Zealand.

*Stage 2* covers the year 1998, which appeared to be a period of supply-side stability – both in terms of prices and market entry/exit. However, because of a growing awareness of the possibilities the Internet had to offer, demand for Internet services grew by over 100% in the same period! While users were broadly segmented into residential and business customers, most ISPs could be distinguished as either 'generalists' (Xtra, Clearnet, and Voager) or 'nichers' (most regional ISPs as well as iHug, NetLink and Actrix). Ihug's strategy of expanding, reducing cost, and concentrating on heavy users resulted in being the third largest service in the country.

After that period of stability, *Stage 3* (1999) showed another increase in competition, with incumbents aggressively seeking to maintain their relative position. A general move away from time-billing towards offering flat rate Internet services led to increased Internet use. ClearNet introduced flat rate Internet services in June 1999, ParadiseNet (through Saturn) followed in July. In the same period, Ihug reduced its (monthly) flat rate from $45 to $39.50 in response to Xtra's price announcement. During the entire period covered, i.e. from 1996 till 1999, user prices of Internet access decreased substantially. To illustrate, the monthly price for a mid-range user decreased from somewhere between $110 and $150 at the beginning of 1996 to approximately $30 at the end of 1999[20].

[20] A mid-range user uses 20 hours per month of connection and downloads 100Mb of international traffic, 50% at peak usage. This characterizes either a heavy residential user or a small business. In contrast, a low-

### *2.3.2 2000: Free Internet access is born*

The first free ISP in New Zealand was Freenet, launched in February 2000 by Compass Communications, who invested $1 million setting up the service. Although the free Internet access was restricted to a maximum of ten hours a month, Freenet was quite a success initially, as 10,000 new customers signed up in the first four weeks, a number which was doubled by April 2000. The offer entailed paying $1.50 per hour after those ten free hours or a $19.95 flat rate for 300 hours a month, no joining fees, and the promise of no advertisement-overload as was the case with many free services already operating in Australia and the United States. According to The New Zealand Herald (2000a), Freenet was clearly targeting existing rather than new Internet users.

Two months later in April 2000, i4free – a venture backed by National Mail director Paul Meier, Attica Communications director Wayne Toddun, and CallPlus director Malcolm Dick - was launched, residing on Clear's network. I4free was in fact the first ISP to offer unlimited free Internet access. In contrast to Freenet, it said it aimed to finance its business through advertising revenue and commissions from online sales[21], an approach that seemed to be successful for quite a few booming free ISPs in Australia and the United States (see §3.1). Shortly after, Telstra Saturn purchased ISP ParadiseNet Limited, which at the time had about 33,000 subscribers throughout New Zealand, mostly residential. Also in April, ISP Surf4nix was launched on Telecom's network. In that same month, the Government announced that the Commerce Act 1986 would be strengthened[22].

In May that year, Telecom and Clear reached an agreement on the 0867 Internet number range. Another interconnect agreement was announced in July, between Telstra Saturn and Telecom. Subjects of agreement were wholesale services, 0867 Internet traffic and pole-sharing. According to the Ministry of Economic Development (2001), a key feature

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end user only consumes 10 hours, downloads 20Mb all at peak usage times, and a high-end user uses 50 hours, downloads 500Mb, 20% at peak usage. See Enright (2000).

[21] The New Zealand Herald (2000b).

[22] An important part of the changes was that the phrase "dominance" in Section 36 of the Act would be replaced with the lower threshold of "a substantial degree of power in a market" and that the word "use"

of this agreement was the introduction of a form of "bill and keep" arrangement for local interconnection, which implied different operators would only bill their own customers and not pay each other any termination charges for ISP-bound calls as long as the two-way traffic was reasonably balanced. More importantly, calls to ISPs were now considered 'call-sinks' for which no termination charges had to be paid (see §4.4). September 2000 saw a new wave of price decreases with Clear announcing its new flat-rate access to the Internet for $24.95 per month after Xtra had announced it intended to do the same (iHug had been offering this new flat rate deal for several months already)[23]. October 2000 is the month in which the final report from the Ministerial Inquiry into Telecommunications was released. The inquiry recommended a single regulatory framework covering all electronic communication services, the designation of interconnection with Telecom's fixed wire network, specification of interconnection between all networks, and the application of access objectives to assess whether specification or designation of a service was desirable. Clear and Telecom reached a new interconnection agreement, also including so-called "bill-and-keep" and "callsink" provisions (see Section 4.4). Shortly after, Clear's Zfree (then the largest free Internet provider) announced it had reached 250,000 registered users and had to suspend new registrations to ensure Zfree's quality was maintained.

### *2.3.3 End 2000 – Mid-2002: The end of free Internet access*

Surf4nix ceased trading in November 2000, and advised its 2,500 subscribers in Auckland, Wellington, Christchurch and Hamilton to switch to i4free's service. However, shortly after Zfree's announcement, i4free also warned customers that its quality of service would continue to deteriorate unless they joined its new pay service. It had reached 145,000 subscribers at that time[24]. Another free ISP, Splurge (with a customer base of just 5,000 in the Auckland region only), began charging for its services in April 2001. In May, The New Zealand Herald reported: "New Zealanders' access to free

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was to be replaced with "take advantage of". These changes would bring New Zealand competition policy on dominance more in accordance with Australia's policy, which was already using that terminology.

[23] Ministry of Economic Development (2001)

[24] Internetnews.com (2001).

Internet services has been dealt another body blow"[25]. ISP Freenet had, after having offered unlimited free internet access, cut down its offer back to the initial ten hours in January and subsequently back to 3.5 hours a month in May. Customers that wanted to spend more time online had to pay a monthly charge of $14.75. Out of the approximately 50,000 users that had signed up for the free service, between 15,000 and 20,000 had switched over to the limited service. At this time, the Telecommunications Bill, containing the legislation to implement the new telecommunications regulatory regime, was introduced to Parliament. The resulting Telecommunications Act was passed in December of that year. Rumours about the country's last remaining free ISP, Zfree, having to shut down were already circulating in February 2002, perhaps mistakenly based on technical problems with international bandwith[26]. Either way, the trend in the free ISP market could not be misinterpreted: the average free ISP was not to live a long and prosperous life. Zfree had to cease its business in July 2002 and its customers were redirected to Clearnet.

[25] The New Zealand Herald (2001).
[26] The New Zealand Herald (2002a).

# 3 Explanations for the existence of free ISPs

To get a better understanding of the development of free ISPs in general and the ones in New Zealand in particular, we need to take a closer look at their foundations. We now know *how* and *when* they emerged, but perhaps a more interesting question is *why* they entered the world of telecommunications. The obvious answer to the question why any business enters an industry is of course to generate supra-normal profits that are believed to be 'out there', either now or in the (direct) future. But how can anyone make a profit out of giving away Internet access for free? Our analysis will outline a number of important possible profit sources that have attracted / may attract free ISPs. Section 1 will discuss the business model explanation for the existence of free ISPs, which is the possibility to generate revenue from online advertising and e-commerce. Section 2 will then use the model of Laffont et al (1998a) to set out how ISPs can generate revenue from terminating calls, which seems to have been the main reason for the development of free ISPs in New Zealand. For the purpose of completeness, Section 3 will shortly discuss to what extent the existence of free ISPs may be part of the strategic behaviour of telecommunications operators and fee-charging ISPs.

## 3.1 Advertising

### *3.1.1 'Success' stories from the UK, the USA and Australia*

During the second half of the 90s, the United Kingdom appeared to be a successful pioneer in the field of free Internet access. According to a UK Internet source: "These totally free ISPs have several different methods they use to earn revenue. Some earn revenue from advertising and e-ecommerce sales. Many of them are actually phone companies who offer totally free Internet service as an enticement to get you to use their phone service for your regular phone calls as well"[27]. Internet site Australia.Internet.com similarly argues the success of free ISPs in the UK is due to the fact that "[…] calls are timed and the ISPs have revenue share agreements with the major Telcos". Around the same time, free ISPs started to appear in the United States as well. This business model was mainly based on advertising and commerce revenues, however, and seemed quite

[27] DailyeDeals (2002).

successful at first sight: revenues of giant NetZero (founded in 1997) had increased from US$122 at the end of 1998 to US$12,242 at the end of 1999! Specifically, some say NetZero could use the demographic information it obtained from its subscribers to charge US$10 more per demographic category (i.e, age, location, etc.) over their base rate of US$20 CPM[28], going as high as US$65 CPM[29]. However, because operating expenses had increased substantially as well, Netzero ended up with a net loss of US$24,576 that year and eventually merged with its largest competitor, Juno (founded in 1995)[30] halfway through 2001.

Nevertheless, optimism was the rule at the time and most ISPs were convinced online advertising and e-commerce were little goldmines waiting to be exploited. In 1999, one of the leading research institutes expected Internet advertising expenditures to rise to US$22 billion by 2004[31]. New Zealand's neighbour Australia also got caught up in the hype and followed the example set by the Brittish and the Americans. Although Free.net.au had to cease its business only months after it was founded, rival FreeOnline appeared to be quite successful, claiming it had over 500,000 subscribers halfway through 2000. The experiences abroad and the global optimism and belief in rapidly expanding online commerce may have had some influence on the emergence of free ISPs in New Zealand in the beginning of 2000.

### *3.1.2 ISPs in New Zealand financed by advertising revenues*

In February 2000, Compass Communications Ltd launched Freenet, an ISP that offered 10 hours of free Internet access. It sought to finance the free service mainly through commissions from online sales rather than through advertising. Rival i4free was launched two months later. Although its main driver was the interconnection payments, it also considered alternative revenue streams. In addition to advertising and sales commissions, alternative revenue sources considered included charged technical support services,

[28] CPM: cost per thousand units of advertisement; common measure in online advertising price calculations.
[29] Zigmont, J. (1999).
[30] At the time, Juno had approximately 10 million subscribers. Since their merger in June 2001 they are both part of United Online.
[31] Forrester Research at Iconocast.com (1999).

content filters, opt in email, and anti-virus software. All in all, these alternative revenue sources (that mainly consisted of advertising and sales commissions as most of the others were never implemented) accounted for approximately NZ$40,000 per month or 7.5% of i4free's total revenue. Despite the seeming 'success' stories abroad, advertising and e-commerce revenues have never become really significant to ISPs in New Zealand. ISP Xtra confirms that advertising revenues were almost fictional and mostly a matter of public relations – nowadays they still account for only 3 to 5% of total revenue. According to a number of (both free and charging) ISPs, advertising and e-commerce were relatively insignificant even to the free ISPs as they got the bulk of their revenues from interconnection payments.

### *3.1.3 Flaws of the advertising and e-commerce business model*

Although it seemed a success formula in the beginning, after a while advertising revenues started to decrease dramatically, resulting in many free ISPs closing their business or charging their customers for their services. Reasons for this decline were twofold. The first is the global recession that followed the collapse of the NASDAQ stock exchange, representing and resulting in decreasing business and consumer confidence. Strengthened by the terrorist attacks of 11 September 2001 and a number of corporate scandals in the United States, this recession caused advertising spending to drop substantially[32]. Even though online advertisement is not included in the data published by the Communications Agencies Association of New Zealand (CAANZ)[33], it is a fact that growth in total advertising in New Zealand decreased substantially during the global recession (see Appendix E). A second reason for decreasing advertising expenditure and the associated decline in free ISPs is inherent to the business model and has been put by the Economist (2002) as: "The reason for the bloodbath is simple: advertisers are not willing to pay enough for web ads to support the cost of displaying them". As intermediate advertising

[32] At the end of March 2001, NetZero and Juno – by then United Online – started billing certain services. At that time, their advertising and commerce revenues still amounted to US$10,992 and billable services revenues only contributed US$1,778, but the main revenue sources changed: in June 2002, their billable services accounted for US$47,888 whereas advertising and commerce revenues were US$6,561. United Online financial results.

[33] According to the CAANZ: "Online and direct marketing are not included in these figures, because expenditure is not measured officially". However, a new online measurement system has recently started, called RedSherrif Internet Ratings, which is to overcome this problem.

networks and of course the ISPs take part of the revenue, the resulting revenue for the advertising company is not worth investing in an on line campaign in the first place. The results of a recent survey of 3,000 Web surfers[34] confirm this.

## 3.2 Revenue from terminating calls

The second explanation for the existence of free ISPs appears to be the main reason for the development of free ISPs in New Zealand. The analysis is based on interconnection agreements between networks and associated revenue streams between networks and carriers and/or ISPs. As much contemporary literature modelling interconnection issues between networks is built on Laffont, Rey and Tirole ((LRT) 1998a), their basic model will be used to explain fundamental relations between actors in the telecommunication industry and their effects on performance. In addition, we will heavily draw upon Wright (2001) to translate the general results from Laffont et al (1998a) to the ISP market.

### *3.2.1 The LRT model*

For the purpose of analysis, the basic model as described in Laffont et al (1998a) is subject to a number of assumptions. In their framework, networks are horizontally differentiated according to the Hotelling model of network competition[35]. Two other key assumptions are balanced calling patterns (i.e., for equal marginal prices, flows in and out of a network are balanced – even if market shares are not) and reciprocal access pricing (i.e., a network pays as much for termination of a call on the rival network (an "off-net call" as it receives for completing a call originated on the rival network). In addition, the basic model assumes total coverage (all consumers are connected to either one of the networks), constant elasticity of demand and no price discrimination[36]. A summarised mathematical overview of the model is given in Appendix F.

[34] Burst! Media, in: CyberAtlas.internet.com (2002)

[35] According to the Hotelling model, in the simple case of uniform pricing, all consumers are distributed uniformly along a straight line and two networks are located at each end of the line. In this model, it is assumed that customers have no preference for either seller except on the ground of price plus the cost of transporting the goods from the network's location to their own location. Hotelling (1929).

[36] See Laffont, Rey and Tirole (1998b) for a version of the model that does allow for price discrimination.

When analysing reciprocal access pricing, $a$ denotes the unit access charge to be paid for interconnection by a network to its competitor and $\sigma$ is an index of substitutability between the two networks. One of the main conclusions of Laffont et al (1998a) is that when $\sigma > 0$ and all parameters are fixed except for the access charge $a$, a unique symmetric equilibrium exists for $a$ close to marginal cost c, in which $p_1 = p_2 = p^*(a)$. However, that equilibrium fails to exist when the access charges are high and/or the degree of substitution between the networks is very low or high. A large access charge inflates the final price in any shared market equilibrium or – in case of sufficient substitutability – leads to an unstable situation in which each network could obtain positive profit by raising its price and generating access revenue. If substitutability is very low, each network may behave monopolistically, resulting in inefficiencies (and high access charges!) because of the double marginalisation problem[37]. If substitutability is high, each network has an incentive to undercut its rival's prices in order to increase market share and avoid paying access charges.

Not surprisingly, a related conclusion from the above model is that the two main determinants of competitiveness are access charge $a$ and measure of substitutability between the two networks $\sigma$. The access charge may act as an instrument of tacit collusion in case it is agreed upon between two network operators, since retail price $p^*$ increases with $a$. Firms may keep retail prices artificially high by setting a high access charge. However, $p^*$ decreases with $\sigma$ and it converges to the Ramsey price as $\sigma$ gets very large[38]. The Ramsey benchmarks are obtained by maximizing consumer welfare subject to the industry breaking even. The resulting $p^R$ and $a^R$ are therefore considered socially optimal in the absence of industry subsidies or taxes[39]. One of the main results from Laffont et al (1998a) is that the socially optimal access charge lies below the marginal cost of access, whereas the monopoly access charge lies above the Ramsey benchmark.

[37] This problem arises when one monopoly's mark-up is placed on top of another.
[38] To compare: for $\sigma = 0$, $p^*$ is equal to the monopoly price for marginal cost $c + (a - c)/2$ (which involves a double marginalisation problem if there is a markup on access).
[39] For a detailed derivation of Ramsey prices in one-way and two-way interconnection, see Jeon (2002).

Nonlinear price competition, i.e. two-part tariffs, yields pricing at marginal cost. However, for firms, these are not the industry marginal cost but rather the *perceived* marginal cost (including the effect of access charges). Compared to uniform pricing, two-part tariffs leads to analogous results. The key difference, however, is the fact that the intensity of competition does not vary with access charge *a*. For instance, if access charge *a* is raised, each network's marginal cost increases, and so do usage fees. To keep net surplus and market share constant, a network must reduce its fixed fee, which lowers the gain from attracting a new customer. But on the other hand, the increase in *a* provides an additional incentive to attract a customer, as this saves an extra amount in access charges. According to Laffont et al (1998a), the two effects cancel, which is why the intensity of competition does not vary with the access charge.

### *3.2.2 Consequences for the ISP market*

The basic termination model shown in *Figure 2.2* indicates the relations and revenue streams between the various actors in the telecommunications industry: the originating operator has to pay for interconnection links with the terminating operator, who in turn is likely to have an agreement with an ISP[40]. The principle of reciprocity broadly says that the access charges between two carriers must be the same for both carriers regardless of the direction of the traffic[41]. However, not only are there no return calls in the case of dial-in traffic bound for ISPs, the cost of terminating ISP-bound calls is far below the cost of terminating regular calls. According to Wright (2001): "The termination of ISP-bound traffic typically requires less equipment for call routing than voice calls since calls to ISPs can be broken out from the gateway switch and carried to the ISP's modem bank. The routing of voice calls requires substantially more switching and transmission costs"[42]. In addition, calls to ISPs usually take much longer than regular calls. It appears that an important reason for the existence of free ISPs in general and the ones that existed in New Zealand in particular is the generation of lucrative termination revenue on ISP-

[40] According to OFTEL (2000), the termination operator will often act as a 'backbone' or 'carrier ISP' processing the traffic and providing connectivity to the Internet at large, while the 'consumer ISP' resells the Internet access provided by the carrier and packages it with its own content or portal site.
[41] Wright (2001).
[42] Moreover, ISP modem banks are far more geographically concentrated than a typical residential or business customer base. Wright (2001).

bound traffic. According to Wright (2001), the *efficient* termination charge for ISP-bound calls equals the network operator's retail price for a local call, less the cost it incurs in originating the call. Assume rival networks set an access charge of

$$a = P - c^{o}$$

per minute for termination, in which $P$ reflects a regulated charge per minute for each call[43] and $c^{o}$ is the per-minute cost for originating or terminating a typical local call. Letting $p$ denote a per-minute retail price for Internet usage and $(c^{T} + c^{I})$ the per–minute cost of providing the service, consumers of ISP dial-in then face usage prices of

$$\begin{aligned} p + P &= c^{T} + c^{I} - P + c^{o} + P \\ &= c^{T} + c^{I} + c^{o}, \end{aligned}$$

which in fact reflect the true costs of ISP dial-in. However, in jurisdictions with binding regulation on the price of outgoing local calls, in particular free local calling[44] and reciprocity for local call termination (as agreed upon by telecommunications operators in interconnection agreements) like New Zealand, efficient termination charging requires the *cost* price of local calls to be incurred by the (regulated) network operator (and passed on to consumers), instead of the lower *usage* price that is often used in practice. ISPs encourage greater Internet usage by lowering their usage prices, so that they can increase their termination revenues. As a result, Internet access will have a per-minute price below cost. Moreover, reciprocity implies that the per-minute component of any termination charge will be set *above* the efficient level. As a result of termination charges being set above the cost of terminating calls, money is transferred from the main network operator to the consumers and rival carriers, as arbitrage possibilities lead to increased Internet usage, the tendency for operators to set access prices even higher and Internet prices even lower, in turn attracting more users, etc. Wright (2001) argues that for sufficiently high termination charges, ISPs will offer no per-minute charge (that is, flat rate Internet

[43] $P$ is considered optimal for local voice calls but not necessarily for ISP dial-in calls. See Wright (2001).
[44] As determined in the Kiwi Share Obligations.

access). Chambouleyron (2002) goes one step further by reasoning these termination revenues could possibly cover all costs the ISP has to incur and may therefore actually lead to free Internet access.

## 3.3 Strategic behaviour of operators and fee-charging ISPs

Arbitrage benefits from interconnection agreements and advertising revenues seem to be the main reasons for the development of most free ISPs. For the purpose of completeness, however, we should also look at other explanations that have been opted. These imply that offering free Internet access is part of the strategic behaviour of operators that have market power and / or fee-charging ISPs. Drawing upon Haan (2001), it can for example be shown that under certain conditions it is profitable for a monopolistic telephone operator to offer ISPs a lump-sum contract that induces them to offer free Internet access. Another explanation is that offering free Internet access may be part of a quality discrimination scheme of fee-charging ISPs in order to capture consumer surplus and maximize profits.

### *3.3.1 Telephony operator offers contract to induce free Internet access*

The basic model assumes two firms, one providing regular telephony, the other providing Internet access. Haan (2001) assumes that each firm is a monopolist in its market. Joint profits are not maximized because of the double marginalisation problem. According to Carlton and Perloff (1994): "If the manufacturer and the distributor are both monopolies, each adds a monopoly mark-up (the difference between its price and its marginal cost is positive), so consumers face two mark-ups instead of one. This double mark-up provides an incentive for firms to either vertically integrate or use vertical restrictions to promote efficiency and thereby increase joint profits". Haan (2001) bases its analysis mainly on this phenomenon and suggests that there is scope for side payments between the telecommunications operator and the ISP. According to Haan (2001), the optimal solution for firm $T$ is to offer a lump sum $L$ to firm $A$ conditional on $A$ setting $p_A = 0$.

Haan (2001) shows that when some of the stringent assumptions of the model are relaxed or additional assumptions are made, the basic result may still hold. For one, when

assuming the presence of transaction costs involved in setting up, formulating, and policing a contract, firm *T* will still find it profitable to offer a contract that induces free Internet access *if* a critical size of the market is reached. Secondly, when assuming a non-cooperative oligopolistic rather than a monopolistic Internet market, it can still be profitable to offer a contract to an ISP that implies free Internet access. However, again a critical market size needs to be reached, which increases with *N*, the number of ISPs active. Another extension to the basic model shows the relationship between market size and the presence / absence of free Internet access when the dial-up Internet access market is included in the analysis (see Appendix G).

A crucial argument against the practical relevance of Haan's model, however, is the fact that the ISP market is in fact a rather contestable market – as we have seen in Section 2.2 – instead of the monopoly assumed by Haan (2001). Indeed, as indicated above, Haan recognises that as the number of firms N increases, it becomes increasingly less profitable to offer the ISPs a contract to induce free Internet access. Hence, in a competitive ISP market, we would not expect telecommunications operators to offer ISPs such contracts as there is no double mark-up problem to be solved, i.e., no joint profits to maximise.

### *3.3.2 Quality discrimination*

Versioning is the practice of offering a product in different versions for different market segments. As versioning induces a process of self-selection, i.e., consumers reveal their price-sensitivity (or any other underlying characteristic) by choosing a particular version, producers may engage in non-uniform pricing in order to capture (part of) the consumer surplus and hence, maximize profits. Carlton and Perloff (1994) define non-uniform pricing as: "[…] charging customers different prices for the same product […]". Specifically, quality discrimination is a method of non-uniform pricing in which a firm offers consumers different versions of its product for which price increases with quality. Quality discrimination allows producers to capture more consumer surplus than under a uniform pricing schedule. Free Internet access may be considered a free *version* of the product/service 'Internet access' in a quality discrimination scheme designed to maximise profits.

Shapiro and Varian (1999) argue that information goods are especially suited for versioning, as firms can easily and cheaply change certain product features as the costs of creating different versions of those products are usually marginal. The authors advise producers to identify the key dimensions of their product that are valued differently by various consumer segments, to induce a process of self-selection (see *Figure 3.1*).

**FIGURE 3.1** PRODUCT DIMENSIONS SUSCEPTIBLE TO VERSIONING

| *Product Dimension* | *Likely Use(r)s* |
|---|---|
| Delay | Patient/impatient users |
| User interface | Casual/experienced users |
| Convenience | Business//home users |
| Image resolution | Newsletter/glossy uses |
| Speed of operation | Student/professional users |
| Format | On-screen/printed uses |
| Capability | General/specific uses |
| Features | Occasional/frequent uses |
| Comprehensiveness | Lay/professional users |
| Annoyance | High-time-value/low-time-value users |
| Support | Casual/intensive users |

*Source: Shapiro and Varian (1999)*

Even though Internet access as such is not an information good, but rather an infrastructure service, ISPs can still use some of the above product dimensions to create different quality versions of Internet access and thereby induce self-selection and maximise profits. Perhaps the most obvious product dimension to obtain this goal is speed of operation. Free Internet access is likely to attract many customers, including new users who reason they might as well 'try out' the Internet as long as it is offered for free. However, as free Internet networks tend to get congested because of high demand, the resulting waiting times and number of times one has to reconnect may start to frustrate certain users (including the ones who tried out the Internet and have become regular users). These customers would consequently be willing to pay a certain sum of money in exchange for a somewhat higher speed of operation. Heavy users would in fact be willing to pay an even higher amount than regular users in turn for an even higher speed of

operation, while people who hardly use the Internet would probably be content with the (no) payment / congestion mix they get from free ISPs.

Similarly, different consumer segments place different values on the quality dimension 'technical support', allowing ISPs to offer different support packages for different prices and let consumers show their price-sensitivity by selecting the amount of technical support of their preference. ISPs that charge for their Internet services usually offer technical support 'for free', whereas the users of i4free for example, had to pay NZ$2 per minute if they dialled the 0900 helpline. By similar reasoning, one can also see how the offering of different quality features such as email, web space, and (un)limited use may separate different market segments. In conclusion, by considering free Internet access as but one version of the service 'Internet access', firms may attract new customers and eventually induce them to pay a positive price for a higher quality version of Internet access. At the same time, to reduce profitable access by consumers, they offer consumers a wider variety of services and different prices.

## 4 Strategic and environmental causes of the emergence of free ISPs

In addition to theoretical explanations of the development of free ISPs, it is very useful to analyse the forces that stimulated the development of free ISPs in New Zealand, as it was the first OECD country to introduce full competition in telecommunications. Having a closer look at specific competition and environment-related economic and strategic causes that may have stimulated that development will provide us with great insights in this business model and its implications for the telecommunications industry in general, and the ISP market in particular. Following the strategic timeline sketched in *Figure 4.1*, Sections 4.1 to 4.4 will analyse the main events in the recent history of the New Zealand telecommunications industry from a strategic perspective. Section 4.1 will analyse the strategies of both Telecom and Clear at the time of signing their interconnection agreement of 1996. Section 4.2 will then take a closer look at their strategies after the contract was signed, and what caused Clear to withhold payments to Telecom in 1997. Telecom's response to the emergence of (free) ISPs on Clear's network and heavy Internet growth was its 0867 access package, which is discussed in Section 4.3. Finally, Section 4.4 will analyse the 2000 interconnection agreements to indicate the main reasons for the death of the free ISPs.

**FIGURE 4.1** MAIN STRATEGIC EVENTS IN NEW ZEALAND'S TELECOMMUNICATIONS INDUSTRY SINCE 1995

| | |
|---|---|
| 1996: | Telecom / Clear dispute and interconnection agreement |
| 1997: | Clear withholds payments to Telecom because of discounting competition |
| 1998: | The interconnection dispute continues… |
| 1999: | Telecom starts trying to capture all data traffic within its 0867 number range |
| 2000: | Free ISPs emerge<br>April: entry blocking<br>May: 0867 agreement between Clear and Telecom<br>Oct.: new ICAs signed; bill-and-keep and callsink provisions |
| 2001: | Free ISPs cease their business<br>Introduction of access regulation |

## 4.1 The Telecom / Clear interconnection agreement

### *4.1.1 (Lack of) Information*

At the time the interconnection agreement was negotiated there was information asymmetries and an uncertain future (see *Figure 4.2*). First of all, Telecom had been the sole telecommunications operator since 1987 and could therefore be expected to know the local call market in detail with respect to demand, technology, and regulation. In addition, it must have had more financial data concerning cost and revenue functions. Clear[45], being the new entrant in the market, did not possess such data[46]. However, being a subsidiary of British Telecommunications, it could benefit from the latter's experience in a regulated competitive environment – experience that Telecom lacked as it had been the incumbent monopolist until deregulation.

**FIGURE 4.2** INFORMATION ASYMMETRIES AND INCOMPLETE INFORMATION

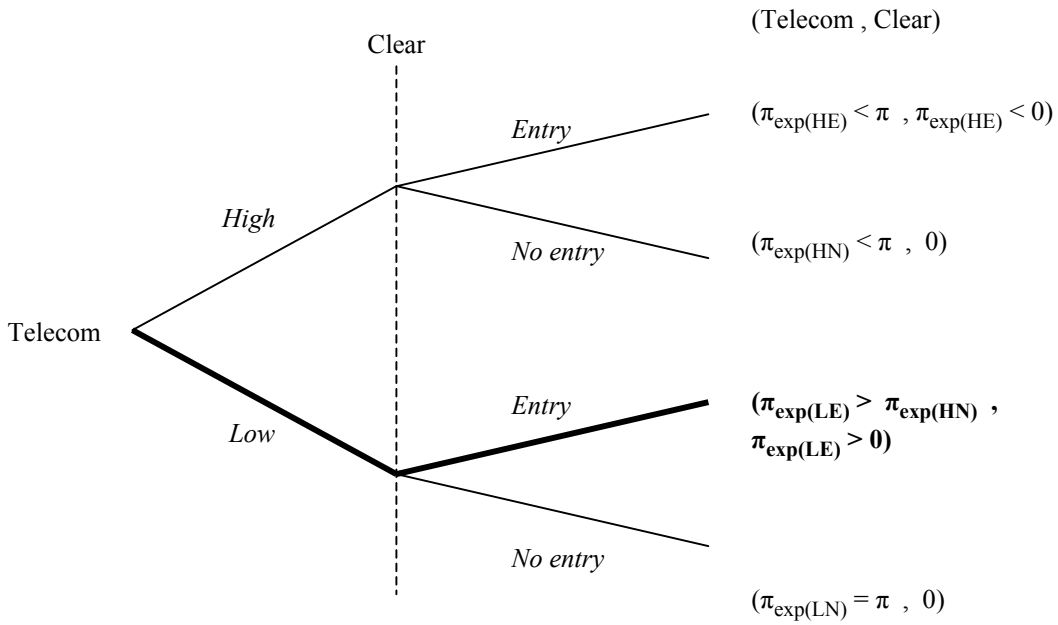
| | **Telecom** | **Clear** |
|---|---|---|
| *Knew* | The local call market<br><br>Exact financial data (costs, revenues, etc.) | How to operate in a regulated competitive market (British Telecom experience) |
| *Did not know* | How the competitive market was affected by the Commerce Act<br><br>Rival's strategy<br><br>Future changes in technology | The local call market<br><br>Exact financial data (costs, revenues, etc.)<br><br>Rival's strategy<br><br>Future changes in technology |

[45] Before March 1996, Clear was owned by Bell Canada, TVNZ, Todd Corp. and MCI Communications. British Telecom (BT) bought the Bell Canada share of 25% in March 1996 and by February 2000, Clear was entirely owned by BT.

[46] Although one might assume it had the necessary analytical tools to at least get a fair impression of the market.

There was incomplete information in the overall market in the sense that both players did neither know their (future) rival's strategy, nor any future technological changes. The latter appeared to be crucial, as the surge in Internet growth and the associated demand for Internet services led to the emergence of (free) ISPs and consequentially, to a high volume of one-way traffic from Telecom's network to Clear's network (in turn leading to a high amount of one-way interconnection payments from Telecom to Clear). Lack of information about the future implies that economic actors act on the basis of their expectations in a world of uncertainty[47].

**FIGURE 4.3** TO ENTER OR NOT TO ENTER




Possible strategies Telecom: set a high or a low interconnection price.
Possible strategies Clear: enter or not enter.

$\pi$ : current profit $\pi_{exp}$ : expected profit
H: high (interconnection price) L: low (interconnection price) E: entry N: no entry

[47] Arrow (1974).

Using *Figure 4.3*, we can reason backwards to get an understanding of the two telcos' expectations at the time they signed their interconnection agreement. In a somewhat simplified version of the final negotiations between both parties, we can say that initially, Telecom had the choice of offering "high" (for example 5 ct/min) or "low" (i.e. 2 ct/min) interconnection prices. However, the idea behind the deregulation was to stimulate competition and offering a high interconnection price would most likely have been considered use of dominance as set out in S.36 of the 1986 Commerce Act. Given this reasoning, Telecom was more or less forced to offer relatively lower interconnection prices because the legal costs of breaching the Commerce Act would leave it worse off otherwise. In addition, the threat of bypass (i.e., other firms establishing and offering similar network services) would have put some pressure on Telecom's pricing strategy. The above implied that Clear could make the main decision in this game: to enter or not to enter. We can reasonably assume that Telecom had some knowledge about Clear's preferences as it could foresee that its rival was likely *not* to enter if it faced high interconnection prices (costs), but *would* enter if it faced low costs[48]. Knowing Clear's preferences, Telecom had to compare its expected profits $\pi_{exp}$ in the possible outcomes "high – no entry" (HN) and "low – entry" (LE). Because we know the final outcome of the game (LE), we can reason that at the time of the interconnection agreement, Telecom must have expected the low pricing strategy to cause its future profits to be larger than they would be under a high pricing strategy (incorporating the effect of the legal costs of breaching the Commerce Act and the threat of bypass), given the fact that Clear would enter. Clear, however, expected positive profits as well. With the above expectations about their future profits, both parties signed the interconnection agreement in 1996.

### *4.1.2 Risk bearing*

Arrow (1974) recognises that if markets for future goods (i.e. Internet services) are nonexistent, there will be uncertainties about the other markets (i.e. local call market). When there is uncertainty, risk aversion implies that steps will be taken to reduce risks. By signing the interconnection agreement with Telecom, Clear faced the risk that the spot

[48] It is reasonable to assume Telecom had a fair idea about Clear's preferences as Clear had already indicated these during earlier attempts to negotiate an interconnection agreement with Telecom.

market price of interconnection access might fall more quickly than expected, and also the risk that new pricing regimes that would be disadvantageous to Clear might become important in the market. Evans and Quiqley (2000) suggest that one way in which Clear was able to reduce this risk was to credibly use a claimed violation of the Commerce Act as a means of breaching a contract provision whose *ex post* realisation was disadvantageous for it (which is exactly what it did, see Section 4.2). It would choose to do so if

$$E.Legal_C < pr.(E.Compensation + E.\ Legal_B + E.Award),$$

i.e., if its expected (E) legal costs were smaller than the expected compensation, the legal costs of a unilateral breach ($Legal_B$), and an anticipated award (adjusted for the probability of winning *pr*).

Given the fact that Telecom knew Clear could reduce its risk this way, we would expect it to react in several ways[49]. First of all, it is likely that Telecom would make a larger specific investment in information relating to the range and probability associated with outcomes of the contract. Second, we would expect Telecom to shorten the length of the contract to restrict the period over which there would be uncertainty about the realisation of contingent events. Third, Telecom's own lack of an option to breach a contract provision[50] in combination with its investment in information and its preference for a short-term contract suggests that Telecom would require a higher expected return to sign the interconnection agreement. Although we cannot comment on the investments Telecom has made in information associated with different outcomes, it did – counter-intuitively - sign a contract for a five-year period, which, as Evans and Quigley (2000) justifiably note, is a long term given the rate and uncertainty of technological change and new entry to the modern telecommunications market. Apparently, the expected rate of return was sufficient for Telecom to outweigh the risk of Clear breaching the contract and claiming violations of the Commerce Act, and to sign the interconnection agreement.

[49] Evans and Quiqley (2000).

### *4.1.3 Role of regulation*

Although any potential for bypass, and competition enforced by the Commerce Act more or less forced Telecom to offer relatively low access charges in its negotiations with Clear, there was great legal uncertainty concerning S.27 and S.36 of the 1986 Commerce Act. According to Evans and Quigley (2000), there is no unambiguous definition of contractual provisions that are in breach of the Commerce Act and it is in most cases a time consuming and expensive process to ascertain whether the Commerce Act has in fact been violated. They reasoned this is partly due to the wording of Section 27 of the Commerce Act[51]. Uncertainty concerning possible future events that may cause a contract to breach S.27 of the Commerce Act created legal uncertainty in designing the 1996 interconnection agreement. In addition, when Telecom and Clear commenced negotiations, the application of S.36 of the Commerce Act to the problem of ensuring access to the facilities of an integrated monopolist was largely untested. In the light-handed regime, application of the Commerce Act and Court processes were considered last-resort methods to solve interconnection negotiation difficulties. As a consequence, there was a high degree of uncertainty surrounding what behaviour the Courts would hold to be anticompetitive, and, in particular, the legal limits on the terms and conditions that Telecom could legally offer[52]. This uncertainty has delayed access agreement and is one of the reasons why negotiations between both parties took five years. However, contrary to what one would expect (short-term contracts because of the high costs of signing long-term contracts due to uncertainty), Telecom and Clear signed a five-year interconnection agreement.

## 4.2 The dispute continues…

### *4.2.1 Action and reaction*

Only five months after signing the agreement, Clear attempted to renegotiate its terms. In February 1997, it began withholding ten percent of the amount due to Telecom in terms

[50] A dominant firm would be less likely to be able to appeal to the Commerce Act for a justification of breach.
[51] See Appendix B.
[52] Ministry of Commerce (1995)

of the agreement[53]. In April that year, Telecom sought High Court orders to confirm Clear's ability to pay the disputed charges, that by then allegedly exceeded NZ$20 million[54]. According to the Ministry of Economic Development, Clear filed a defence to Telecom's claim on 5 May 1997, counter-claiming alleged breaches by Telecom of the Commerce and Fair Trading Acts. Specifically, Clear alleged that Telecom had deliberately changed Clear customers who pre-selected Clear as their long distance calls provider, back to Telecom, *and* that Telecom's practice of selling services at a discount where the amount of discount significantly depended on the composition and value of the bundle, was anticompetitive and contravened the Commerce Act. In 1998, the Court of Appeal reaffirmed that Clear could withhold payments until a final judgment was delivered[55]. The two-part interconnection agreement between Telecom and Clear consisted of a volume usage charge with the fixed connection fee set at zero. Hence, whatever the scale of Clear's business, it would pay a flat per minute usage charge, which implied that Clear had no access to any volume discounting that other forms of two-part tariffs could have provided and that would have allowed it to match Telecom's prices[56].

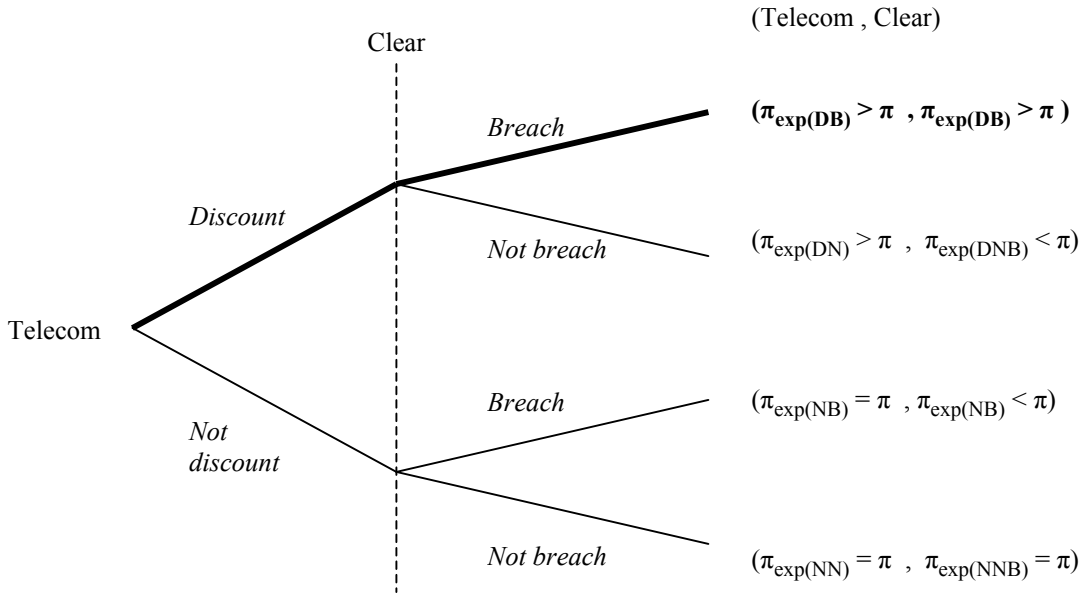
### *4.2.2 Analysis of the parties' expectations and strategies*

Telecom had used its discount strategy on a trial basis in the period before the contract with Clear was signed, and this was public knowledge at the time the contract was actually signed. This implies that Clear might have foreseen that Telecom would apply similar strategies in the future ("discount"), to depart from the equilibrium created by the interconnection agreement attempting to increase profits. If we further assume that Telecom could in turn foresee the likely option of Clear breaching the contract and claiming a violation of competition law as a response strategy ("breach"), we can set up a similar sequential game to the one in *Figure 4.3* to analyse both parties' expectations after the interconnection agreement was signed[57]. Knowing that Clear would probably

[53] Carter and Wright (1997).
[54] The New Zealand Herald (1999a).
[55] Ibid.
[56] Evans and Quiqley (2000).
[57] Note that is it implicitly assumed that Clear would only breach the contract as a response to Telecom's alleged anticompetitive pricing schedule, and would not do so if Telecom would not engage in that strategy because Clear would probably not have a strong case in court and legal costs would decrease its profits.

only breach the contract if Telecom applied its discount pricing strategy[58], the latter was faced with the choice between "discount – breach" (DB) and "not discount – not breach" (NN). As its expected profits were apparently higher in the first option, the new equilibrium outcome was the one in which Telecom applied its toll discounts and Clear breached the contract and turned to the judicial system claiming a violation of the Commerce Act, reasoning the discount scheme set aside the interconnection contract, or parts of it.

**FIGURE 4.4** TO DISCOUNT OR NOT TO DISCOUNT




Possible strategies Telecom: to discount or not to discount.
Possible strategies Clear: to breach or not to breach.

$\pi$ : current profit $\pi_{exp}$ : expected profit
D: discount N: not discount B: breach NB: not breach

[58] It would financially not make sense for Clear to breach the contract and turn to the judicial system in absence of Telecom's discount strategy, because it would most probably have a very weak case against Telecom and consequently, high legal costs and low expected payoffs.

### *4.2.3 Exogenous technological change*

During the ongoing struggles between the telco's, an exogenous change in technology that was not incorporated in the parties' expectations (see *Figure 4.2*) occurred. Internet growth had surged and consequently, the demand for Internet services had risen substantially. Clear soon realised that this demand would cause a high amount of one-way traffic to ISPs and hence, that terminating those calls – if originated on the Telecom network - would enable it to generate large amounts of interconnection revenues. Due to the Kiwi Share Obligations' free local call requirement and th4e fact that Telecom supplied almost all household access, most calls to ISPs *did* originate on the Telecom network (at zero price), allowing Clear to benefit of all one-way traffic to ISPs on its network[59]. As we would expect, Clear signed interconnection contracts with many ISPs in which it agreed to give them a certain percentage of the extra revenue it got for every minute of ISP-generated traffic. These offers were a strong incentive for most ISPs to agree to operate on Clear's network, as before that time, they actually had to purchase business lines from either network in order to be able to offer their services. In fact, interconnection revenues turned out to be more than sufficient for some to offer free Internet access. As Clear acted as the first-mover in the new equilibrium that was now characterised by the exogenous technological change that was called 'Internet growth', all Telecom could do was to cover this action to protect as much of its market share as possible. Free ISPs were an arbitrage response to the existing interconnection agreement that offered these opportunities because of exogeneous technological changes.

## 4.3 Telecom's response to (free) ISPs: the 0867 access package

### *4.3.1 The problems faced by Telecom*

According to the New Zealand Institute of Economic Research (Febr. 2000), the fact that the physical structure and workings of the network and the financial arrangements that surround it, were out of kilter with the way it was being used, created two problems:

- a possible series of physical risks to the smooth operation of the network;

[59] This is the main reason why operation of free ISP Surf4nix was not viable: as it operated solely on Telecom's network, it could not benefit from interconnection payments from Telecom to Clear.

- a genuine resource cost problem relating to a growing mismatch between the charging regime and the incentives to users.

The first problem appeared much less severe to Telecom than the second, as counter arguments claimed Telecom had an intelligent network superimposed on the basic network and calls beginning with 08 and 09 were automatically routed on to the intelligent network, giving Telecom more traffic control[60]. In addition, Telecom's own ISP Xtra was one of the major growth drivers, implying that Telecom would know about the growth in traffic. Telecom did have reason to worry about the second issue. According to The New Zealand Herald (2000d): "[…] if a customer was permanently online, he or she would rack up more than 700 hours of use in a month, costing Telecom more than NZ$840 in interconnect charges per line". The 0867 access package was to solve both these problems and, hence, to protect Telecom's profitability.

### *4.3.2 Telecom's instruments to enforce 0867 numbers*

Telecom had a number of instruments with which it attempted to route all data traffic through its network. According to The New Zealand Herald (2000d): "To make the switch palatable, [Telecom] pledged to the Government that 0867 calls would remain free and that their quality would be as least as good as the old numbers". In addition, Telecom charged its customers 2c/min after ten hours of free monthly access for standard local dial-ups. Unwilling to pay this rate, many customers became willing to dial a free 0867 number to access their ISP, instead of the normal seven-digit number. This forced ISPs to sign a 0867 agreement with Telecom so that their customers would actually be able to access them through a particular 0867 number. Shortly before the 0867 prefix would come into effect at the beginning of November 1999, Telecom announced it would not deliver Internet traffic to or from other networks that had not signed. At that time, no other network had signed the 'agreement' presented by Telecom[61]. An alternative approach to persuade ISPs to sign a 0867 agreement was to offer compensation deals. Notably, rumors circulated that Ihug had received a compensation payment to sign the agreement with Telecom[62]. About ten ISPs – including Ihug – had been granted

[60] New Zealand Institute of Economic Research (2000).
[61] The New Zealand Herald (1999b)
[62] The Internet Society of New Zealand (2000).

extensions to complete the switch to the 0867 gateway (i.e., dial the old seven-digit number in case of connection problems) because Telecom had failed to provide the service by its own November 1 deadline.

### *4.3.3 Number porting and entry blocking*

Free ISP i4free was to launch 3 April 2000 on Clear's network, but its entry was effectively blocked by Telecom, as it cut off lines servicing the ISP and organisations believed to be associated with it. I4free was going to use number porting, i.e., diverting calls to its 0867 number to Clear's network to still be able to terminate Internet calls on that network and receive interconnection payments from Telecom for it (see *Figure 2.1* and Section 2.2). Telecom argued that its actions were due to fears of exchange overload. Later that day, an interim injunction was granted barring Telecom from disconnecting i4free users. Justice Potter ruled that if overloading occurred, Telecom had to apply its restrictions proportionately on other 0867 Internet users as well – which it had not done (Freenet, for example said not to be affected by the overloading). In addition, the ruling commented that the growth in Internet calls had not been entirely unanticipated, as Telecom's own ISP, Xtra, was the largest contributors to that growth[63]. However, four days later, the newspapers reported that Telecom was again restricting access to i4free, overriding the interim injunction[64]. Telecom argued it had to do so because it's Airedale St exchange in central Auckland was experiencing severe overloading. Today, both i4free and the Commerce Commission are still involved in a Court battle against Telecom alleging the above behaviour and the introduction of the 0867 access package were anti-competitive. Another example of entry blocking occurred in the same week, although that appeared to be merely 'a public statement'[65].

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[63] PECC (April 2000).

[64] Attrition (2000).

[65] According to The New Zealand Herald (2000c): "Ihug blocked the i4free and Freenet websites after learning that i4free had won a temporary injunction on Monday that prevented Telecom from disconnecting i4free's 0867 access number". The main reason for barring its 65,000 customers from accessing the two rival free web services was to protect its users from a market aberration. Ihug states the action was merely a public statement of its managing director at the time, Nick Wood, to show he did not believe the free Internet scenario was a viable one. Ihug admits that New Zealand's light-handed regulation and weak enforcement mechanism did play a role in deciding to actually make the statement. Ihug reversed its restriction shortly after, following widespread complaints from users and condemnation from the Internet Society of New Zealand.

### *4.3.4 Clear and Telecom reach 0867 agreement*

In May 2000, Clear and Telecom finally reached a three-and-half-month agreement on the 0867 access package, which, according to both parties, provided a breathing space in which they could renegotiate their interconnection agreement, which was to expire at the end of 2000. The main result was that Internet users would no longer pay 2c/min for non-0867 Internet calls. Other aspects of the agreement were:

- Clear and Telecom would sign an agreement whereby Clear would provide Internet access services under an 0867 agreement;
- Clear would withdraw its application for an interim injunction requiring Telecom to honour the terms of the number portability agreement between the two companies;
- Telecom would not appeal against the interim injunction granted to 14free[66].

### *4.3.5 Role of competition law*

It is likely that the regulatory setting in the telecommunications industry in New Zealand, characterised by a high degree of uncertainty surrounding what behaviour the Courts would hold to be anticompetitive, influenced Telecom's decision to introduce the 0867 package in the first place. Carlton and Perloff (1994) state: "Large expected penalties reduce the expected value of forming a cartel […]". The same reasoning applies to use of a dominant position under the Commerce Act. In other words, because Telecom *expected* there to be uncertainty about the legality of its actions and because it did *not* expect punishment, it probably introduced the 0867 package earlier than it would have done under stricter regulation. Indeed, the legality of the 0867 issue *was* the subject of disagreement. The New Zealand Institute for Economic Research (Febr. 2000) thought of the 0867 package as a "[…] solution that would have emerged in a competitive market and probably one approved by a 'rational-regulator' […]" and was of the opinion that the 0867 'solution' was efficient in the New Zealand setting. However, ISPs and Clear of course protested against the 0867 access, and in August 2000, the Commerce Commission commenced High Court action against Telecom, alleging that it contravened

[66] Scoop Business (2000).

S.36 of the Commerce Act[67] in introducing its 0867 package. As mentioned earlier, the case is still to be settled.

### 4.4 The 2000 interconnection agreements

The series of interconnection agreements that started approximately in 2000 is quite distinctive from the 1996 agreements. First, Telecom entered into limited "bill and keep" type agreements with its main competitors, which means that so long as the number of calls between each local network is roughly in balance neither party charges the other for taking or receiving calls[68]. In the interconnect agreement between Telecom and TelstraSaturn (July 2000), both parties agreed that "[…] the per-Call and per-minute charges each carrier must pay […] are nil for all Chargeable Intra-LICA (Local Interconnect Calling Area) Calls unless the Calls involve Excess Minutes", where 'excess minutes' account for potential imbalances in taking / receiving calls. In the interconnect agreement between Telecom and Clear (Oct. 2000), the same charges were "[…] nil for all Chargeable Calls unless the Calls involve Uncapped Minutes", where 'uncapped minutes' referred to minutes called in excess of specific quantity limits agreed upon by both parties[69].

Secondly, the 2000 interconnection agreements distinguished themselves from their predecessors in that they introduced the concept of "callsink calls", which were intra-LICA calls terminating at "[…] any Local Number or group of Local Numbers allocated to an Entity […] where

(a) that Local Number, or each Local number within that group, receives during a month more than 10 times as many minutes of Chargeable Intra-LICA Calls than the minutes of Chargeable Intra-LICA Calls originating at such Local Numbers during that month ("the Asymmetrical Traffic Number or Numbers"); and

[67] See Appendix B.
[68] Ministry of Economic Development (2001).
[69] For example, there is a cap of 1,142,500,000 minutes in aggregate in the case of a) standard calls and intra-LICA calls terminating in a primary major LICA in which the calls are handed over and (b) toll bypass calls and toll-free calls originating in a primary major LICA in which Clear has established a handover point. Telecom (2000b).

(b) the Asymmetrical Traffic Number or Numbers receive during a month more than the Threshold Percentage of the total minutes of Chargeable Intra-LICA Calls received during that month in that LICA by the carrier that is terminating Intra-LICA Calls at the Asymmetrical Traffic Number of Numbers"[70].

In Section 4.1 of the Telecom-Clear interconnection agreement and in Section 5.1 of the Telecom-TelstraSaturn interconnection agreement, it was agreed that: "[…] the per-Call and per-minute charges […] are not payable for any Chargeable Intra-LICA Calls terminating at any Callsink". The 'clean slate' deal between Clear and Telecom further included a settlement of all litigation between Clear and Telecom, including Commerce Act and 0867 proceedings, Clear getting wholesale access to Telecom's fast Internet service Jetstream, and charges at an agreed rate for 1828 million minutes of toll calls and 49 million minutes of mobile calls by Clear customers.

The callsink clause implied that carriers would no longer charge their competitors / ICA partners for terminating calls on the dial-up numbers of (free) ISPs, which by definition generated much one-way traffic and could be characterized as "callsinks". Herewith disappeared the main source of revenue for most free ISPs. The "bill and keep" clause only marginally contributed to this effect, however, as it required a 'rough balance' between the numbers of calls between the networks (and carriers could thus only marginally benefit from 'rough imbalances'). Nevertheless, the 2000 interconnection agreements, and especially the "callsink" clauses, can justifiably be considered the main cause of the end of the free ISPs and return to charged Internet access. Mr. Karim Hussona, chief executive of Compass Communications (Freenet), stated literally: "In the past, when it was funded by interconnection, it was easy to make money out of it. Now the customers have to pay for it"[71].

[70] Telecom (2000b).
[71] "It" being the provision of Internet access (red.). The New Zealand Herald (2001).

# 5 The implications of free Internet Service Providers in New Zealand

The fact that free ISPs have emerged, operated, and then ceased business in New Zealand enables us to analyse the effects that free ISPs had on Internet access demand and supply, and to learn from the New Zealand experience to anticipate possible outcomes in other countries. To obtain a comprehensive understanding of the implications of free ISPs, we have to compare usage data before, during, and after the existence of free ISPs. The number of customers and the amount of Internet usage are our main instruments in conducting this analysis. In Section 5.1 we analyse the implications of the free ISP development on demand for Internet services in New Zealand, mainly utilising data from New Zealand's largest ISP (Xtra – 50% market share[72]). Section 5.2 takes a closer look at the (potential) effects of free ISPs on economic efficiency, competition, and overall welfare. Finally, Section 5.3 discusses the key differences between the New Zealand case and the ISP developments in the United States, Australia and the United Kingdom, and the associated differences in performance.

## 5.1 Implications of free ISPs on the demand for Internet services

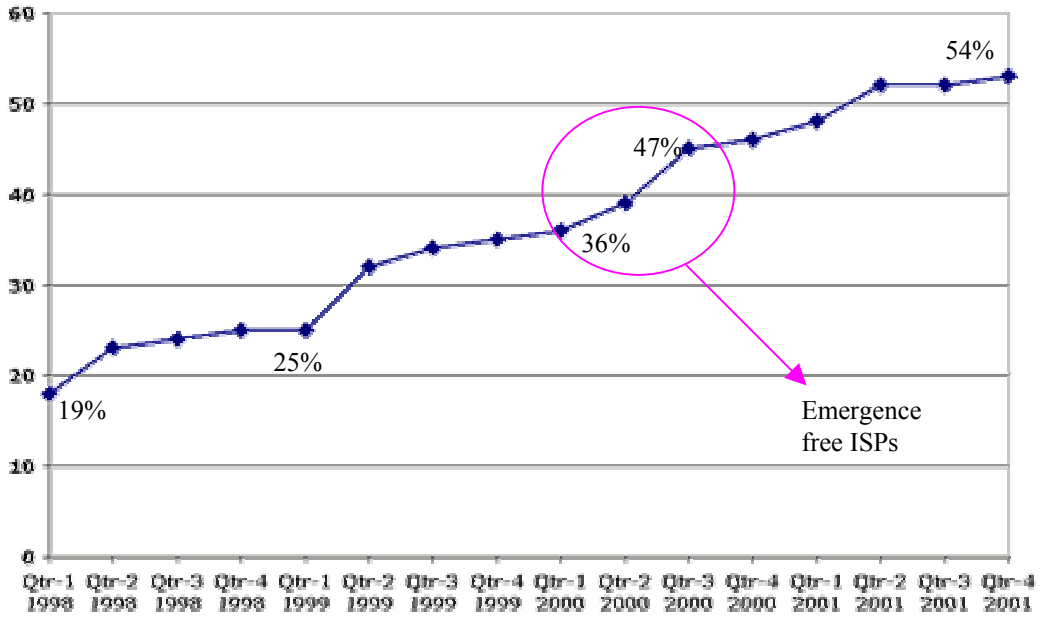
### *5.1.1 Free ISPs lead to increased market demand for Internet services*

We expect the emergence of free ISPs to cause an increase in the demand for Internet services, as (for normal goods) price declines increase demand. However, growth in telecommunication services occurred anyway due to exogeneous factors and network effects associated with adoption of the Internet[73]. These also account for increasing demand for Internet access and so the appropriate variable to examine for the effects of ISPs is the *growth* of demand for Internet access. Emergence of free Internet services *on top of* the continuous growth effects mentioned above would lead to the expectation of an increased growth in market demand and substitution away from pay ISPs with the introduction of free ISPs. These two effects are confirmed as we observe an increase in total Internet usage growth (see *Figure 5.1*)[74] as well as a decrease in Xtra's consumer

[72] Xtra market share estimations (2002).
[73] Where the value of most network services tends to increase with the number of users.
[74] However, the evidence of Figure 5.1 is that the effect of free ISPs on overall growth is limited because there were other growth episodes inicated by the Nielsen (2002) statistical sample. Because it is a sample, some variation is to be expected.

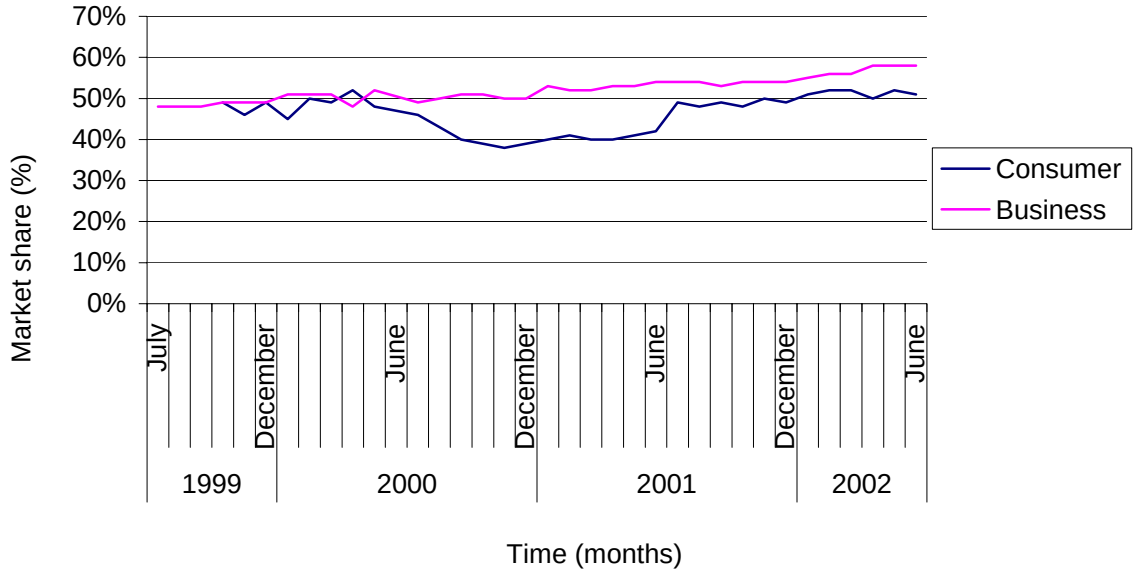
market share in the period the free ISPs existed. Its business market share has remained relatively constant, however, implying that mainly residential consumers subscribed to the free ISPs (see *Figure 5.2*). This may be explained by businesses placing relatively more value on quality than price (and pay ISPs were associated with a higher quality than free ISPs).

**FIGURE 5.1** INTERNET USAGE LAST FOUR WEEKS 1998 – 2001




*Source: AC Nielsen (2002)*

**FIGURE 5.2** XTRA'S MARKET SHARE JULY 1999 – JUNE 2002

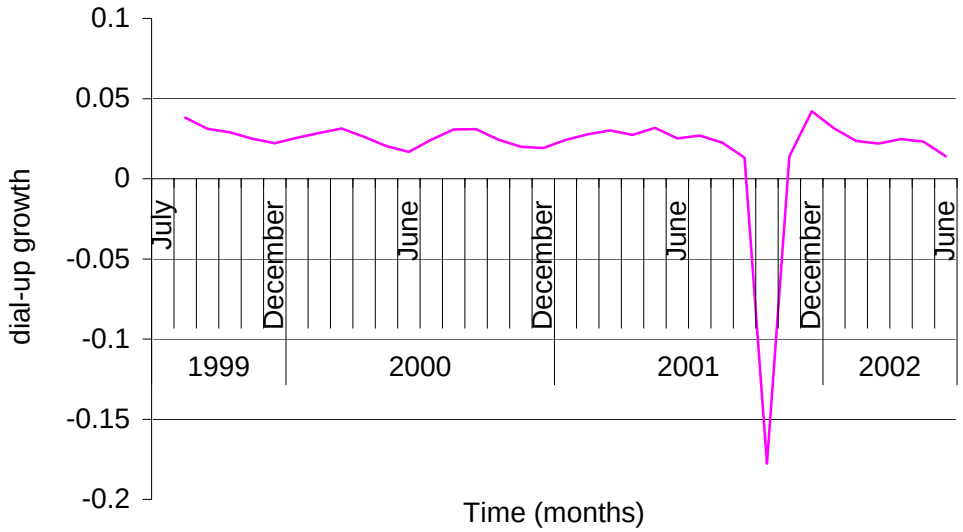



*5.1.2 Increased growth in demand for pay ISP services after existence of free ISPs*

Even though Xtra's market *share* decreased, the growth in its number of accounts has been fairly stable in the period before, during, *and* after the existence of free ISPs, roughly ranging between 1 and 4 % per month (see *Figure 5.3*). This implies that in *absolute* terms, Xtra growth was not affected by the emergence of the free ISPs[75].

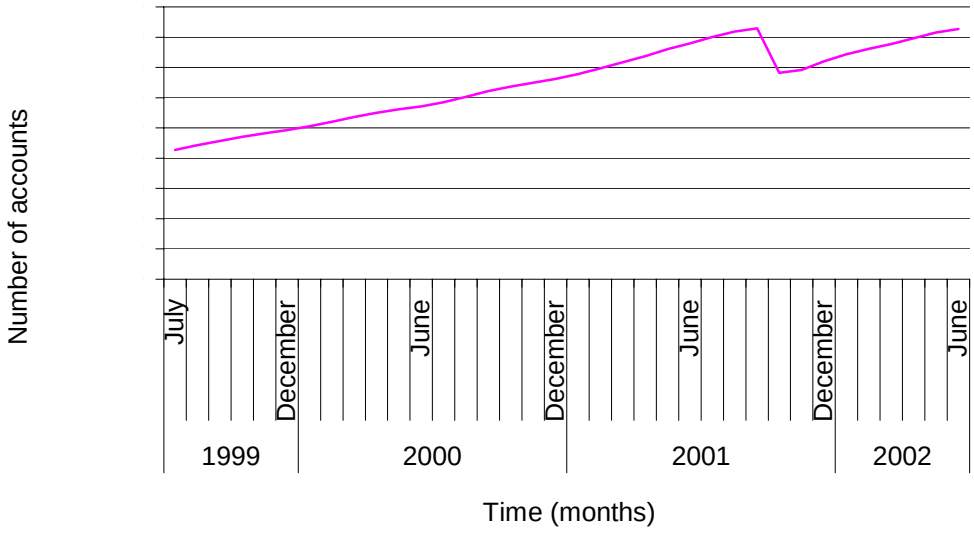
[75] The sudden drop in October 2001 can be explained by the fact that at that point in time, Xtra removed all its inactive accounts (accounts that had not been used for 12 months, most likely *because* they only served as an insurance against potentially failing free ISPs). Before that time, the minimum package offered by Xtra was NZ$2.50 per hour with no minimum charge. From October 2001, however, Xtra charged NZ$5 for the minimum package and forced inactive users to leave. In other words, this peak was not caused by an exogenous event in the ISP market and is therefore not of great significance to our analysis.

**FIGURE 5.3** XTRA'S DIAL-UP GROWTH JULY 1999 – JUNE 2002




In fact, if we analyse the total number of accounts, we see (ignoring the October 2001 peak) an almost linear, unchanged growth of pay ISP accounts, as indicated in *Figure 5.4*.

**FIGURE 5.4** XTRA'S NUMBER OF DIAL-UP ACCOUNTS JULY 1999 – JUNE 2002



The periods before/during and after the existence of free ISPs roughly coincide with the periods before and after the October 2001 peak, which enables us to separately analyse the implications of free ISPs on growth in Internet services offered by pay ISPs. One would expect an increase in growth in the number of accounts of pay ISPs *after* most free ISPs ceased their business. Many people tried out the Internet through a free ISP because it did not cost anything but still allowed them to explore the "new" service that was becoming more and more common in society. These people often signed up with one of the pay ISPs after the free ISPs ended their operation because at that point they had become aware of the benefits and willing to pay for Internet access[76]. Another reason for the expectation of increased growth *after* the retirement of free ISPs is the expected substitution back to the pay ISPs from existing users who had switched to free ISPs while they existed.

Linear regressions on the number of pay ISP accounts for the entire period (excl. Oct. 2001) *and* the separate periods July 1999 – Sept. 2001 and Nov. 2001 – June 2002 (thereby excluding Oct. 2001 and roughly distinguishing the period before and during, and the period after the existence of free ISPs) result in the outcomes shown in *Figure 5.5*. Within these regressions, the dependent variable ($y$) is the number of dial-up accounts, whereas the independent variable ($x$) is time, measured in months.

**FIGURE 5.5** LINEAR REGRESSION ON XTRA'S NUMBER OF DIAL-UP ACCOUNTS

| *Period* | *Trend line equation* | *$R^2$* |
|---|---|---|
| July 1999 – June 2002 (excl. Oct. 2001) | $y = 5717.581x + 220401.01$ | $R^2 = 0.904$ |
| July 1999 – Sept. 2001 | $y = 7689.369x + 199580.39$ | $R^2 = 0.992$ |
| Nov. 2001 – June 2002 | $y = 9503.881x + 74448.869$ | $R^2 = 0.989$ |

[76] Xtra (Dec. 2002).

The fact that the trend lines for both separate periods each individually have a very high $R^2$ (the coefficient of determination that tells how well the sample regression line fits the data) which in both cases is higher than the $R^2$ of the regression covering the entire period, *and* the fact that the slopes of the trend lines in the separate periods differ to an extent that is significant, indicates that growth in Internet services differed in those two periods[77].

### *5.1.3 Dual usage*

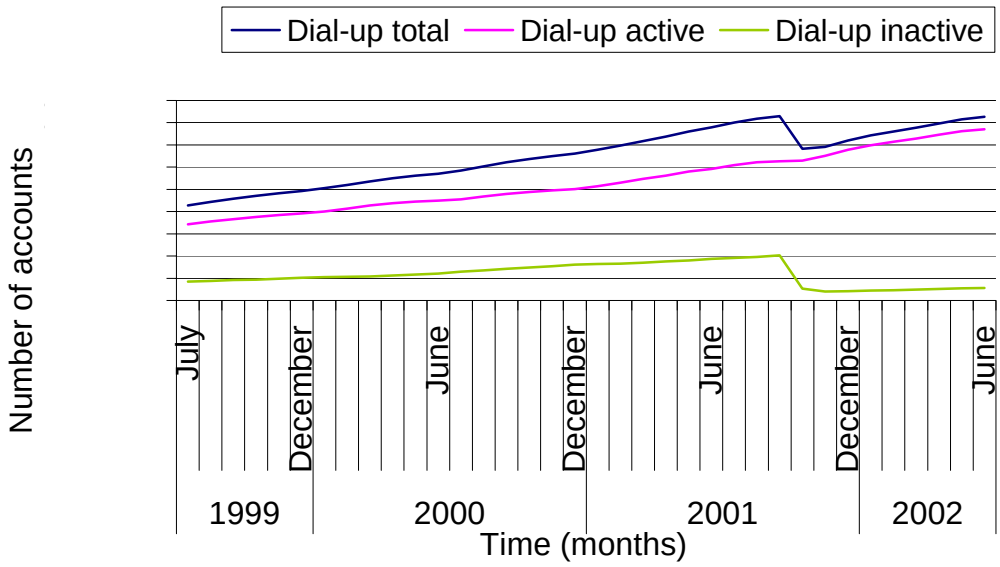
Hence, the data suggest that growth in the number of accounts with pay ISPs *did* increase after the free ISPs ceased their business. However, this effect is possibly mainly due to the fact that the free ISPs had been able to enlarge the market. Many Internet users who were already ISP customers at the time the free ISPs emerged did, may *not* have substituted away from their pay ISP to free ISPs. Rather, they became so-called 'dual users', who maintained an account with a pay ISP while also signing up with a free ISP. The rationale behind this is twofold. When the first free ISP emerged (Freenet), it only offered a limited amount of free Internet access – existing users kept an account with the (pay) ISP that until then had provided them with Internet access outside these limited free hours. Second, existing users expected or experienced the quality offered by the free ISPs to be relatively low, in that congested lines would cause lower speed of operation and the need to reconnect more frequently. These users kept a minimum account with another free ISP or a pay ISP as an insurance which they could use in case of poor performance of their main ISP. The minimum package offered by Xtra at the time was NZ$2.50 per hour with no minimum charge. One indication of dual usage is that many people shifted to that package once the free ISPs emerged[78]. Another is the large number of inactive accounts with pay ISP Xtra, as many people did not actually use their pay account in practice as the limits on free Internet access expanded. However, we cannot simply

[77] Running a right-tail *t*-test to test the statistical significance of this apparent difference confirms that we can reject the null-hypothesis that there is *no* difference at a 5% significance level (see Appendix I). It should be noted though, that the second period (Nov. 2001 – June 2002) only consists of 8 observations and that such a small sample size may influence the statistical significance of the difference between the both periods. When more data becomes available, we can run the same test again to establish whether the difference is actually statistically significant or whether the difference perhaps appears to represent natural variation in the data.

[78] Xtra (Dec. 2002).

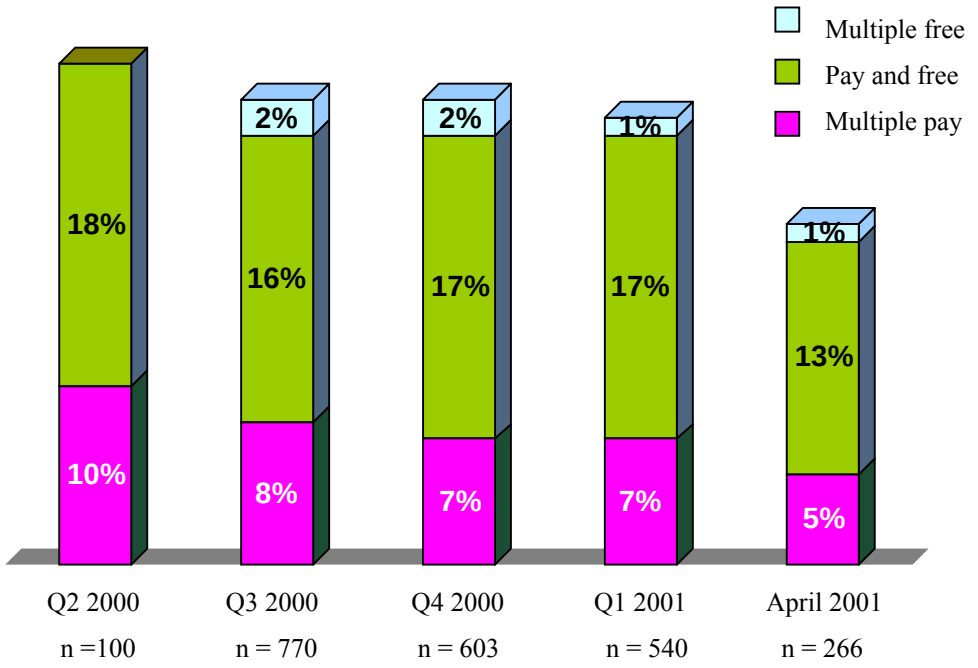
conclude that all inactive users were by definition dual users, and should therefore be careful in drawing conclusions from *Figure 5.6*, where the amount of inactive users is an approximate indication of dual usage.

**FIGURE 5.6** XTRA'S TOTAL, ACTIVE, AND INACTIVE USERS




A better indication of the *type* of dual usage is given by the percentages of customers who had a particular combination of free and/or pay ISPs, as shown in *Figure 5.7*. We see that the main form of dual usage appears to be a combination of a pay and a free ISP, which is analogous to the rationale explained above. Total dual usage decreased as the free ISPs retired and the relative quality of pay ISPs improved over time (which may also explain the decrease in dual usage between multiple pay ISPs).

**FIGURE 5.7** DUAL USAGE




n = number of survey respondents

*Source: Xtra (2002).*

## 5.2 Implications of free ISPs on efficiency and competition

### *5.2.1 Inefficieny in the ISP market*

Economic efficiency implies an allocation of resources within the economy and over time, such that

(1) no other allocation would permit more of one good to be produced without necessarily reducing the output of some other good (productive efficiency);

(2) the goods and services produced are the ones most valued by consumers (allocative efficiency); and

(3) welfare of society is maximised over time (dynamic efficiency).

The question is whether the free ISP development has taken the New Zealand telecommunications industry closer to or further away from full economic efficiency. Allocative efficiency may have been inhibited. The fact that the free ISPs were basically

financed by Telecom through interconnection payments to Clear implies that resources in the industry were allocated such that the productive efficiency principle was likely to be violated. First, the fact that a price of zero in the ISP market will be lower than marginal cost implies that there is excessive demand, in that willingness to pay for the extra demand is exceeded by its extra cost. Even where in these networks marginal cost for general usage is very low, congestion renders high peak marginal costs. In addition, there are the costs of actually providing the ISP services (i.e. labour etc.). If the consumers who cause these costs are not paying them, the inefficiency of excess demand can arise.

Allocative efficiency would also be affected if Telecom's pricing or the quality of the network was affected. If Telecom's costs were entirely fixed, we would not expect to see a change in the telecommunications market. In this case the total net inefficiency would just be the one created in the ISP market. However, if Telecom's 'subsidising' of the free ISPs induced increased competition on other markets than the ISP market the effect of this competition would affect the efficiency of free ISPs.

### *5.2.2 Effects on competition in the PSTN market*

The free ISP development is likely to have intensified competition in the telecommunications industry, eventually resulting in what appears to be accelerated consolidation. Presumably responding to the rising demand for Internet services and the increasingly obvious benefits of call termination and network effects, many telecommunications operators engaged in investments to expand their networks. In February 2000, around the same time that Freenet was launched, Saturn Communications and Telstra New Zealand formed a 50:50 joint venture, announcing to invest more than NZ$1 billion over five years to build a broadband network[79]. Two months later, the new company TelstraSaturn purchased ISP Paradise Net Ltd, which at the time had 33,000 (mainly residential) subscribers throughout New Zealand. Also in April 2000, TelstraSaturn signed a contract with Ericsson Communications to install a new broadband submarine cable between Auckland, Wellington and Christchurch. One month later, Telecom announced NZ$38 million plans to establish a new submarine cable between

[79] Ministry of Economic Development (2001).

North and South Island. Clear followed by announcing to spend NZ$14 million to upgrade its North Island network in August that year.

After having separately invested millions of dollars to establish their own small network, Telstra purchased Clear in December 2001, aiming to strengthen its competitive position relative to Telecom's. At the time, Clear owned New Zealand's largest free ISP (Zfree) and the pay-service Clearnet, and had interconnection agreements with many (free) ISPs that operated on its network. Telecom's ISP Xtra was the largest ISP (approximately 50% market share), while Ihug occupied a solid second place, traditionally being the first-mover, technologically speaking. To obtain Ihug's cooperation, or at least non-resistance, in the battle of the Telcos, and limiting other networks to terminate ISP calls may well explain the alleged compensation payment to Ihug (see Section 4.3.2). The extra profitability to Clear may have financed its ability to compete. In short, the increased demand for Internet services and the free ISP development based on interconnection charges appear to have intensified competition between telecommunication operators in New Zealand, resulting in a highly concentrated telecommunications industry compared to the (already quite concentrated) market *before* the mentioned developments.

### *5.2.3 Effects on Telecom*

First, Telecom's profits in the market for regular telephony services may have decreased because of increased costs due to increased demand for ISP services generating higher traffic flows, and increased competition. The Kiwi Share Obligations limited Telecom's possibilities of raising residential access prices and no actual price increases have been observed. The counterfactual pricing strategy in the absence of free ISPs is not observable. There may have been some negative effect of the extra traffic on the quality of some of Telecom's regular telephony services provided in the course of 2001 (see Appendix H) but it is well within variations experienced at other times.

Second, Telecom's profits may have decreased because the apparent profits to be made through interconnection charges intensified competition, resulting in a flatter, or more elastic, demand curve for Telecom's services. Indeed, we did observe increasing

investments and consolidation among ISPs and telco's (see Section 5.2.3). Transition to the 0867 number range implied ISP operation via Telecom's Intelligent Network[80], which allowed Telecom to have more traffic control. Any decreased congestion costs would have benefited consumers[81].

### *5.2.4 Effects on dynamic efficiency*

The fact that the free ISP development in New Zealand may not have been statically economically efficient does not imply it had no benefits. On the contrary, the potential dynamic gains in efficiency flowing from free Internet services may well outweigh the economic inefficiencies in the process of political decision-making with regard to telecommunications regulation. For one, Howell (2000) states that the free ISPs have appealed "[…] to use where either the usage and hence marginal benefit to the consumer of ISP services is low or for users where, while the benefit is significant, Internet connectivity is a lower priority than other household services". Hence, providing price-sensitive and/or low-income users free Internet services enabled learning and increased the market, which in turn increased the value of the Internet network as the value of a network increases with the number of users. At the same time, the free ISP development narrowed the so-called 'digital divide' (that indicates the different Internet access possibilities between low and high-income users), thereby creating a more equitable social redistribution. Together, these effects increased New Zealand's Internet penetration rates in international comparisons, strengthening New Zealand's position as one of the world leaders in the development and uptake of Internet[82] (see Section 5.3).

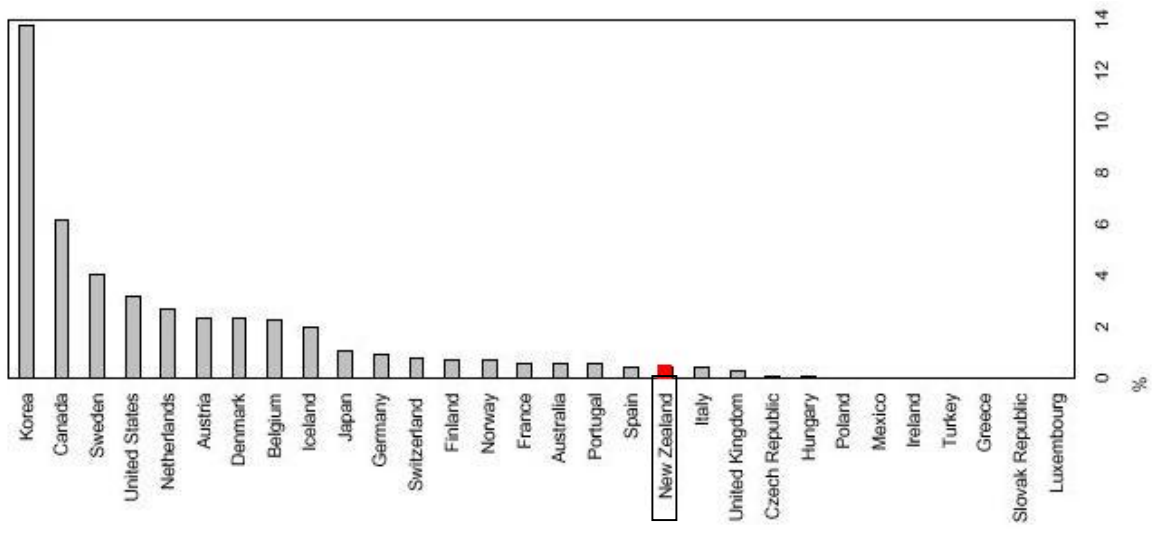
The free ISP episode may have affected dynamic efficiency in two opposite ways. On the one hand, firms in the telecommunications industry may not have the appropriate long-term incentives to invest, innovate or improve the range and quality of services thereby increasing productivity and lowering costs through time. Consumers facing artificially

[80] The Internet Society of New Zealand (2002).

[81] Incidentally, the ability to study voice and data traffic separately puts New Zealand in an almost unique position as most other countries cannot differentiate between voice and data traffic as all calls use the same telephone lines. The learning effects from the New Zealand experience may therefore be of wide interest and applicability.

low prices for dial-up Internet (caused by free local calling *and* free Internet access) may show unnaturally little demand for innovations such as high-speed Internet access, which may make it unprofitable for firms to invest in such services in the long run. On the other hand, more customers or usage may stimulate faster uptake of Internet services and therefore increase innovation. Although many telecommunications operators invested in high-speed Internet services during the free ISP development, expecting the increased demand for Internet services to spill over from dial-up access, we do observe that the uptake of broadband in New Zealand is relatively low within the OECD area. *Figure 5.8* displays the number of DSL, cable modem lines and other broadband per 100 inhabitants.

**FIGURE 5.8** BROADBAND PENETRATION RATES (JUNE 2001)

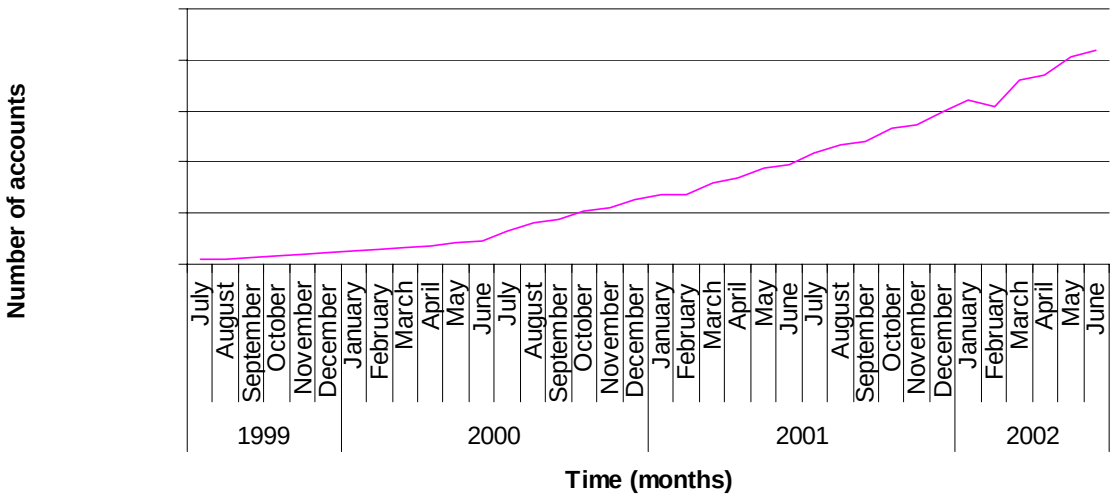



*Source: OECD (2001)*

It appears from total broadband usage data (see *Figure 5.9*), however, that uptake growth in New Zealand has been rather stable over time and, indeed, seems to have been positively influenced by the existence of free ISPs.

[82] Boles de Boer, Evans, and Howell (2000) and OECD (2002).

**FIGURE 5.9** BROADBAND UPTAKE IN NEW ZEALAND JULY 1999 – JUNE 2002




*Source: Xtra (2002).*

It must be kept in mind that these dynamic effects could only exist to the extent that Telecom subsidised the free ISPs through the interconnection payments it had to pay to Clear, and that this had the adverse static efficiency effects already outlined.

## 5.3 International comparison

### *5.3.1 Australia*

Australia, in line with most other OECD countries, has been gradually liberalising its telecommunication industry. The Australian Government adopted a phased approach to the introduction of competition, with the establishment in 1991 of a duopoly to replace the former Government monopoly. Nowadays, Telstra and Optus are still the main telecommunication operators. They provide an unmetered telecommunication services, in that users pay a flat rate per local call irrespective of the duration. Interconnection charges for those calls are rather low, as indicated by the New Zealand Commerce Commission in setting the new interconnection price November 2002 for Telecom: "The final price […] clusters New Zealand with Australia and the United Kingdom". Free ISPs were based on advertising revenues, but this model appeared to be non-sustainable in Australia. According to an Australian news source: "In theory the business model

allowed the service to subsidise the free access through advertising revenue. In practice the bottom fell out of online advertising, just as the services were getting off the ground, and data hungry Internet users were increasingly prepared to pay for services which better fed their habits"[83]. In addition to the global downturn (see Section 3.1.3), the two main problems faced by Australian free ISPs were Australia's market size: "[…] a small advertising pool, in which only a few players are allowed to swim"[84].

### *5.3.2 United States*

In the United States, on the other hand, some free ISPs were able to survive the downturn in online advertising. Some credit the success of those few free ISPs in the US to their "[…] ability to achieve a critical mass through the countries 40 million homes and […] the luxury of lower bandwidth costs" [85]. Many free ISPs went bankrupt or altered their business plans, however. Moreover, the few free ISPs that survived offered limited services that restricted the number of online hours, while charging a fee for longer or unlimited access. The biggest names to survive were NetZero and Juno, which combined in 2001 to form United Online (see Section 3.1.1). According to CNET news (2001), a study conducted by Telecommunications Reports International found that the number of US homes with Internet access dropped by 0.3 percent to 68.5 million during the first quarter of 2001. The decline was considered to be partly due to the shrinking number of free ISPs. The same study also reports a certain degree of substitution towards dial-up ISPs and cable modem services though.

### *5.3.3 United Kingdom*

The United Kingdom has traditionally had a system of metered local calls in which ISPs generally buy the terminating part of the call from the terminating operator, who in turn buys the originating part of the call from the originating network operator (usually British Telecom)[86]. Subscription-free Internet services were enabled through terminating

[83] ZDNet Australia (2002).
[84] Australia.internet.com (2000)
[85] Australia.internet.com (2000)
[86] Oftel (2001).

operators sharing their NTS revenues[87] with ISPs, for similar reasons as in New Zealand (i.e., generating more traffic in order to obtain more NTS revenues). According to Oftel, the pioneer of this model (Freeserve) continues to be the market leader for UK residential and SME dial-up access[88]. Today, the subscription-free ISP model – based on sharing NTS revenues – still exists in the UK, although the Internet services market has matured and demand has shifted towards unmetered schemes[89]. The sharing of NTS revenues with ISPs allows terminating operators to compete based on the revenue share that they pass onto ISPs. In addition, some operators have expanded their product range beyond the simple termination of calls to include additional related services such as modem and server hosting and call management features[90]. Price competition among subscription-free ISPs forced down Internet call charges, and the first partly unmetered ISP packages offered off-peak unmetered access via an 0800 number, but these were limited by time-out periods and were available to only a limited number of subscribers. Unmetered access was the primary focus in 2000.

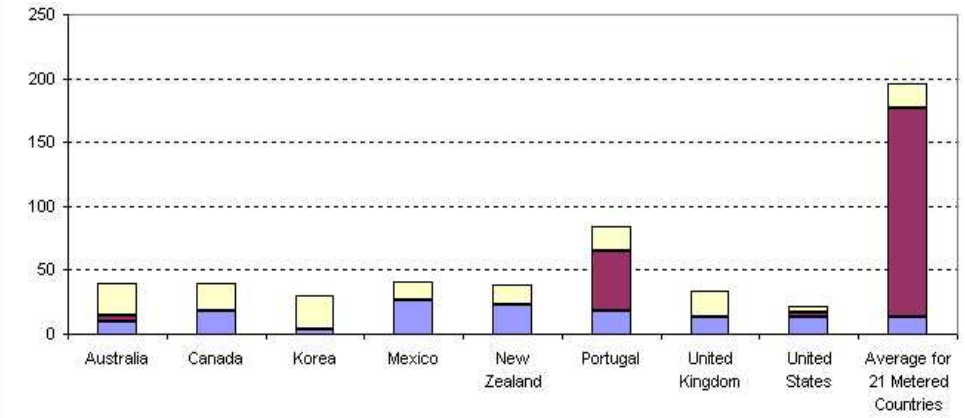
### *5.3.4 General performance across countries*

In many countries, an important reason for the emergence of unmetered Internet access was the introduction of subscription-free ISPs, which forced down prices of Internet services, eventually resulting in the offering of unmetered Internet access packages. Referring to the 2001 OECD STI Scoreboard, the Australian National Office for the Information Economy (NOIE) states that countries which have unmetered local (Internet) calls are amongst the least expensive in terms of cost of Internet access (see *Figure 5.11*) and generally have the highest household Internet penetration levels (see *Figure 5.12*)[91].

[87] The term Number Translation Services ("NTS") describes a range of specially tariffed services, primarily used for telemarketing, which operate within the number ranges 080X/0500 (Freefone), 0345/0645/0845 (local call fee access or LCFA), 0541/0870/0990 (national call fee access or NCFA) and 08xx/09xx (Premium Rate Services or PRS). These services are offered at specific price points in order that customers calling from any fixed network will be able to associate the number range with a particular pricing arrangement. Oftel (2001).
[88] Freeserve was acquired by the French ISP Wanadoo SA in January 2001.
[89] Oftel (2001).
[90] Ibid.
[91] NOIE (2002).

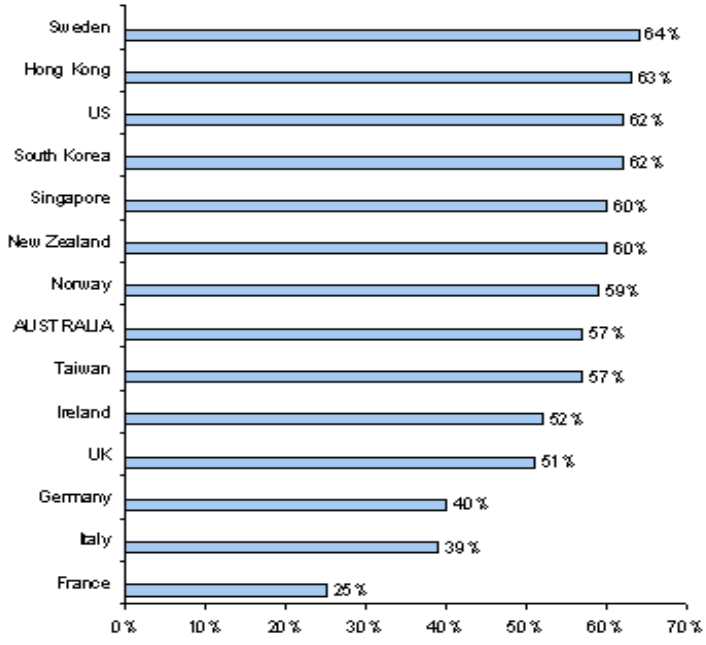
**FIGURE 5.10** PRICE OF "ALWAYS ON" INTERNET ACCESS AT PEAK TIMES, AUG. 2001

In US$ (PPP), including VAT




*Source: OECD (2001).*

**FIGURE 5.11** PERCENTAGE OF PERSONS WITH INTERNET ACCESS AT HOME, SEPT. 2001




*Source: NOIE / Nielsen// NetRatings (2001).*

However, the countries that have unmetered local calls do tend to have low broadband penetration rates (see *Figure 5.8*), suggesting that these unmetered dial-up packages (a likely result of the competitive pressures exerted by free ISP offerings) substitute for the adoption of broadband. According to Oftel (2001): "Analysts and market research widely predict that dial-up access will remain the dominant method of connecting to the Internet among residential consumer and small businesses for the foreseeable future"[92]. On an overall level, considering dial-up access prices, Internet access possibilities and broadband penetration rates, we can conclude that of the countries considered in the above analysis the United States performs best, New Zealand slightly better than Australia and all better than the United Kingdom. It should be noted, however, that all countries perform well in Internet penetration compared to OECD members that have metered local calls.

[92] However, Oftel has also argued that unmetered access is often a stepping stone to broadband.

# 6 CONCLUSION

The New Zealand telecommunications experience illustrates the process of competition in a market for network services, characterised by technological change and minimal regulation. The story of free ISPs is one episode in the battle of Telecom and Clear for the New Zealand telecommunications market. It was enabled by a complex combination of regulation, contractual choices and an unanticipated surge of the Internet. Despite certain static inefficiencies, the free ISPs have brought a considerable number of dynamic efficiencies that should be taken into account when evaluating New Zealand's light-handed policy regime in this industry.

Unlike ISPs in the United States and Australia, free ISPs in New Zealand were never based on advertising revenues. Rather, the New Zealand free ISPs emerged through the simultaneous emergence of the interconnection pricing scheme set out in the 1996 local call interconnection agreement (ICA) between Telecom and Clear, and the unanticipated, explosive growth of the Internet.

Deregulation and growing use of telecommunications services in the early 1990s implied increased demand for interconnection among network operators: For this reason, and in the context of uncertainty arising from lack of information about the future in the face of rapidly changing technology, the main network operators entered into interconnection agreements. The five-year interconnection agreement signed between incumbent Telecom and entrant Clear in 1996 determined that the operators charged each other a certain sum per minute for terminating calls that originated on the other's network. In New Zealand, the Kiwi Share Obligations require Telecom to offer free residential local calls. Given the historical pattern of ownership of the local loop, the bulk of local calls tend to originate on Telecom's network and terminate on competing networks, mainly Clear's. For this reason, it was agreed that Clear would pay Telecom more for each local call originated on Clear's network terminated by Telecom than Telecom would pay Clear for local calls in the opposite direction.

Under this arrangement, the parties faced the risk that unforeseen future developments like new pricing regimes or technological change could cause the contract to turn out disadvantageous to them. Evans and Quiqley suggest that one way in which the parties would be able to reduce this risk was to breach the contract by credibly using a claimed violation of the 1986 Commerce Act[93]. Indeed, only five months after signing the agreement with Telecom, Clear attempted to renegotiate its terms. In February 1997, it began withholding ten percent of the amount due to Telecom in terms of the agreement. Before the High Court where Telecom's application for payments to be made pending resolution of the Commerce Act challenge was denied, Clear claimed that Telecom's discount regime was in violation of the Commerce Act. At the time, under New Zealand's light-handed policy regime there was virtually sole reliance on – in this context largely untested - competition law, and it was generally not certain what contractual provisions constituted a breach of the Act and what behaviour is held to be anti-competitive by the Courts. This light-handed regulation created legal uncertainty in the 1996 interconnection agreement and may well have influenced Clear's decision to breach the contract claiming a violation of competition law.

During the ongoing dispute, an unanticipated surge of the Internet increased the number of one-way calls from mainly households to the network where ISPs were located. This situation created an arbitrage possibility to the benefit of Clear, because of the interconnection contract and the Kiwi Share regulation that prohibits local-call charging. By stimulating one-way traffic from the incumbent network to their networks, competing networks, mainly Clear, benefited from extra termination revenues. One option was for competing networks to convince ISPs to operate on their networks by offering them part of the additional termination revenues. Provided with these financial incentives, the ISPs stimulated the amount of one-way calls from households to the ISPs located on the competing networks, resulting in increasing termination revenues. This arbitrage led to the emergence of free ISPs in New Zealand, like I4free, Zfree, Freenet and others. The termination revenues received by the competing networks and assigned to ISPs encouraged a number of them to offer free Internet services, thereby attracting more

[93] Evans and Quigley (2000).

customers, i.e. one-way calls. To illustrate, the revenues received by some free ISPs amounted to approximately NZ$500,000 per month[94].

It is important to note that such arbitrage possibilities could only exist for the time period covered by the contract. As soon as the interconnection contract ends and the incumbent is no longer required to pay termination fees to competing networks, the ISPs lose their main source of income and are consequently no longer able to offer free Internet services. However, in New Zealand, the heavily paying incumbent (Telecom) decided not to wait till the end of the contract, but instead created a special access package that provided strong financial incentives for ISPs to buy an access number of the incumbent within a certain number range (0867). That number range was then excluded from the interconnect termination payments regime, and all Internet calls were rerouted through Telecom's Intelligent Network. Free ISP I4free attempted to use number porting, i.e., diverting calls through its 0867 number to Clear's network to still be able to terminate Internet calls on that network and receive the associated interconnection payments from Telecom. However, its entry was effectively blocked by Telecom, arguing it had to cut off lines servicing I4free due to fears of exchange overload. I4free took the case to Court and a decision is yet to be made about the legality of aspects of Telecom's actions.

The outcome of the contract / regulatory arbitrage experience was the agreement to establish a bill-and-keep arrangement where neither Telco charged the other for calls terminated in its network.

Looking at the value of free ISPs for New Zealand requires a comparison of static and dynamic efficiency effects. Allocative, static efficiency may have been affected in a number of ways. Firstly, excess demand in the ISP market due to Telecom 'subsidising' the difference between price and marginal cost is economically inefficient as resources are misallocated. Allocative efficiency may further be affected if competition in the Public Switched Telephone Network (PSTN) market, Telecom's pricing, or the quality of its network was affected. The effect of transfers to competitors through the

[94] Toddun, W., *pers comm*, 2002.

interconnection contract and associated free ISPs on competition and the performance of the PSTN market is very difficult to appraise as it involves detailed knowledge of costs, demand and strategies. We did observe increased competition in the PSTN market as more and more operators vigorously invested in the extension and improvement of their respective networks, eventually resulting in consolidation. Increased demand in the ISP market and the associated extra traffic could have affected prices, quality, and profits. The Kiwi Share Obligations limit price increases by Telecom, particularly in the area of local access and call usage. Its response was to install the 0867 access package for ISPs. There is very little evidence for reduced quality of Telecom services.

Dynamic efficiency is represented by economically efficient performance over time in investment, innovation and consumption. Dynamic efficiency was affected in a number of ways during the development of free ISPs. First, the value of the Internet increased as the free ISPs attracted more users. This learning effect may have enhanced the uptake and development of electronic communication. However, market data from the relevant period do not show overwhelming evidence for this. At the same time, the free ISP development may have narrowed the so-called 'digital divide', by creating a lower price to all users to an extent that, together, these effects increased New Zealand's Internet penetration rates. Indeed, judged on international comparisons, New Zealand penetration rates have been very high. Broadband uptake appears to be low in countries in which ISPs offer free Internet services, as customers tend to stick to low cost dial-up schemes. However, as people get more familiar with the Internet, demand for high-speed services may well increase in the near future. This may explain the (anticipating) increased competition and investment in the PSTN market to 2001. Free ISPs forced down prices for Internet services, which eventually led to the introduction of unmetered packages. It appears that performance in the ISP market, measured by price and Internet penetration, is better in countries with unmetered packages (often a consequence of the existence of free ISPs) like the United States, Australia and New Zealand, than in countries where only metered Internet services are offered.

Having analysed the development and implications of free ISPs in general and those in New Zealand in particular, we can conclude that they are a non-sustainable business model. Free ISPs in countries like Australia and the United States, based on advertising revenues, have appeared to be unprofitable. In New Zealand, free ISPs appeared to be merely an episode in the battle of the Telcos, enabled through an exogenous technological change in the face of light-handed regulation and a five-year interconnection agreement. Nevertheless, as our efficiency analysis has shown, free ISPs have clearly not been without impact.

Policy interventions directed at interconnection negotiations and even prices are already taking place even in the most deregulated economies (including from 2001 in New Zealand). However, in evaluating telecommunications regulation, one should not underestimate the potential benefits of operators' flexibility to react to exogenous changes and competition among even a very few players. As we have learned from the free ISP story, this flexibility may result in alterations in market structure and/or performance that cannot be anticipated, but that may nevertheless bring important dynamic efficiencies.

## Appendix A[95]

**Access charge:** Wholesale price to be paid to a network by an interconnecting network for access to a segment of the former network.

**(A)DSL:** (A)symmetric digital subscriber loop, technique allowing higher-speed access through the existing local loop by installing equipment on the premises and before the first switch.

**Bill-and-keep:** Rule under which two local exchange networks do not charge each other for terminating off-net calls.

**Central office:** (also called 'end office') First switch, usually located a few kilometers from the subscriber.

**CLEC:** Competitive local exchange carrier.

**Efficient component pricing rule (ECPR):** Rule for determining access prices by an integrated carrier, under which the access charge is equal to the loss in profit incurred on the competitive segment by the provider of access when it provides access to a rival.

**ILEC:** Incumbent local exchange carrier.

**ISP:** Internet service provider.

**Local loop:** Connection between the subscriber's premises and the end office.

**Number portability:** Possibility for subscribers to keep the same phone number when they change the network to which they are connected.

**Off-net calls:** Calls originating and terminating on different networks.

**PSTN:** Public switched telephone network.

**Termination access charge:** Access charge paid for the use of the network at the termination of a call (as opposed to 'origination access charge').

[95] Definitions taken from Laffont and Tirole (2000).

**Appendix B**

S. 27 (1) of the 1986 Commerce Act

"[…] **Contracts, arrangements, or understandings substantially lessening competition prohibited.**

No person shall enter into a contract or arrangement, or arrive at an understanding, containing a provision that has the purpose, or has or is likely to have the effect, of substantially lessening competition in a market […]".

S. 36 (1) of the 1986 Commerce Act:

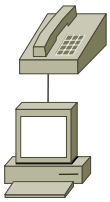
"[…] **No person who has a dominant position in a market shall use that position for the purpose of**

(a) Restricting the entry of any person into that or any other market; or

(b) Preventing or deterring any person from engaging in competitive conduct in that or in any other market; or

(c) Eliminating any person from that or any other market […]".

## Appendix C



End user's home connection, existing of a computer and a regular dial-up telephone line.

Central office; first switch, usually located a few kilometers from the subscriber.

ISP switch

ISP switch

ISP modem bank

## Appendix D

| | |
|---|---|
| **1991 – end 1999** | **Stage 0 (1991 - 1996):** pre-commercialisation era; Clear / Telecom dispute; Interconnection agreement Clear and Telecom (May 1996). |
| | **Stage 1 (mid-1996 – end 1997):** Launch Xtra en ClearNet; Severe price competition among ISPs; IHug offers first flat rate service. |
| | **Stage 2 (1998):** Supply-side stability; Growing demand for Internet services. |
| | **Stage 3 (1999):** Increase in competition between ISPs; Declining Internet access prices; ClearNet and ParadiseNet introduce flat rate access. |
| **2000** | **February:** Compass Communications launches Freenet, 10 hours of free Internet Access, 10,000 new customers in first four weeks. |
| | **April:** i4free is launched, first truly free ISP. Telecom applies call controls on i4free traffic. Government announces Commerce Act will be strengthened. |
| | **May:** Telecom and Clear reach agreement on 0867 access package. |
| | **July:** Telecom and Telstra Saturn sign new interconnection agreement, key characteristics are bill&keep and callsink provisions. |
| | **September:** new wave of price decreases, Clear and Xtra announce flat rate of $24.95, following iHug. |
| | **October:** Ministerial Inquiry into Telecommunications recommends industry-specific regulatory framework. Telecom and Clear sign new interconnection agreement, also including bill&keep and callsink provisions. Zfree reaches 250,000 registered users and has to suspend new registration to ensure quality. |
| **2001 – mid 2002** | **January:** i4free tries to migrate users to pay service, it has reached 145,000 subscribers by then. |
| | **April:** free ISP Splurge starts charging for its services. |
| | **May:** Freenet cuts back free Internet access offer to 3.5 hours per month and charges $14.75 per month after that. Telecommunications Bill is introduced in Parliament. |
| | **December:** Telecommunications Act is passed. |
| | **July 2002:** Zfree ceases its business and redirects customers to Clearnet. |

**Appendix E**

NEW ZEALAND ADVERTISING INDUSTRY TURNOVER

| | 1998 | | 1999 | | 2000 | | 2001 | |
|---|---|---|---|---|---|---|---|---|
| | $M | % | $M | % | $M | % | $M | % |
| Newspapers | 543 | 40.6 | 566 | 39.8 | 596 | 40.1 | 606 | 40.7 |
| Television | 473 | 35.4 | 487 | 34.3 | 501 | 33.7 | 479 | 32.2 |
| Radio | 170 | 12.7 | 178 | 12.6 | 190 | 12.8 | 196 | 13.2 |
| Magazines | 127 | 9.5 | 159 | 11.2 | 157 | 10.6 | 166 | 11.1 |
| Outdoor | 14 | 1.1 | 18 | 1.3 | 28 | 1.9 | 32 | 2.2 |
| Cinemas | 10 | 0.7 | 12 | 0.8 | 13 | 0.9 | 9 | 0.6 |
| **TOTAL** | **1337** | **100.0** | **1420** | **100.0** | **1485** | **100.0** | **1488** | **100.0** |

*Source: Adapted from CAANZ (2002)*

**Appendix F**

In the model of Laffont et al (1998a), given income $y$ and telephone consumption $q$, a consumer located at $x$ and joining network $i$ has utility

$$y + v_0 - t\,|\,x - x_i\,| + u(q)$$

where $v_0$ represents a fixed surplus from being connected to either network, $t\,|\,x - x_i\,|$ denotes the cost of being connected to a network with address $x_i$ ($i = 1\ ,\ 2$) different from the consumer's address $x$, and the variable gross surplus, $u(q)$.

The total marginal costs of a call includes $c_0$ at the originating and terminating ends of the call and $c_1$ in between (covering for example switching costs or trunk lines):

$$c = 2c_0 + c_1.$$

The market shares of both networks are then determined by the point at which customers are indifferent between buying from network *1* or network *2*, given the price plus transport costs. A consumer located at $x = \alpha$ is only indifferent between the two networks if

$$v(p_1) - t\alpha = v(p_2) - t\,(1\text{-}\alpha)$$

or

$$\alpha = \alpha\,(p_1\ ,\ p_2) = \tfrac{1}{2} + \sigma\,[\,v(p_1) - v(p_2)\,]$$

where

$$\sigma = 1\ /\ 2t$$

is an index of substitutability between the two networks. The two networks' market shares are thus $\alpha_1 = \alpha$ and $\alpha_2 = 1 - \alpha$ (because full coverage is assumed).

Two-part tariffs yield pricing at the perceived marginal cost (including the effect of access charges). For firm i:

$$C + \alpha_j (a - c_0).$$

The idea that in case of two-part tariffs, the intensity of competition does not depend on access charge a can be explained as follows[96]. Suppose that the access charge a is raised by δa. Each network's marginal cost increases by δa/2, and so do usage fees. To keep net surplus and market share constant, a network must reduce its fixed fee by $-\delta F = q\delta a/2$. This lowers the gain from attracting a new customer by $q\delta a/2$. On the other hand, the increase in the access charge provides an additional incentive to attract a customer, as this saves an extra amount in access charges equal to $q\delta a/2$. The two effects cancel, and thus the intensity of competition does not vary with the access charge.

[96] Laffont et al (1998a).

**Appendix G**

In the model of Haan (2001), demand for dial-up Internet access is given by

$$q = \gamma - p \qquad \text{for } p \geq 0$$

where $q$ denotes the total demand per unit time and $p$ the full price the consumer has to pay for one minute of dial-up Internet access (existing of the price of telephone connection (data traffic) and the price of Internet access as such, hence $p = p_T + p_A$) and where $\gamma$ is an exogenous parameter. The respective profit functions for telephone firm $T$ and service provider $A$ are

$$\pi_T = p_T (\gamma - p_T - p_A), \quad \pi_A = p_A (\gamma - p_T - p_A)$$

Maximising the latter yields

$$p_A = (\gamma - p_T) / 2 \ .$$

Plugging this back into the profit function of firm T and maximizing with respect to $p$ yields

$$p_T = \tfrac{1}{2}\gamma, \quad p_A = \tfrac{1}{4}\gamma$$

and hence equilibrium profits are

$$\pi_T = \tfrac{1}{8}\gamma^2, \quad \pi_A = 1/16\,\gamma^2 .$$

It is clear to see that a single monopolist controlling both markets would set $p = \tfrac{1}{2}\gamma$ (which is lower than the total price of telephone connection and Internet access $p = \tfrac{3}{4}\gamma$), yielding profits $\pi = \tfrac{1}{4}\gamma^2$, which exceeds total profits of firms $T$ and $A$ in the above scenario.

According to Haan (2001), the optimal solution for firm T is to offer a lump-sum L to firm A conditional on A setting $P_A = 0$. Total profits of *T* from offering this contract are then[97]

$$\pi_T = p_T(\gamma - p_T) - [(\gamma - p_T)/2]^2 .$$

Maximising those profits with respect to $p_T$ and substituting that value in $\pi_T$ and $\pi_A$ yields

$$p_T = 3/5\,\gamma, \quad \pi_T = 1/5\,\gamma^2 \quad \text{and} \quad \pi_A = 1/25\,\gamma^2 .$$

Compared to the situation without the contract depicted above, total profits have increased, firm *A* is worse off[98], and Internet users are better off. Because the double marginalisation problem no longer exists, market inefficiencies have been reduced.

When considering both the regular telephony market and the Internet access market (assuming regular telephony demand is not influenced by the demand for dial-up Internet access[99]), demand for dial-up Internet access services and demand for regular telephony are given by

$$q = \gamma - p_T - p_A \quad \text{and} \quad Q = 1 - \alpha p_T$$

respectively, with $\alpha$ denoting some parameter with $\alpha > 0$. Suppose firm *T* can offer a take-it-or-leave-it contract to firm *A*, promising to pay it a lump sum *L* if and only if it sets $p_A$. The possible strategies for *T* are now (1) offering a contract and serve both markets, (2) bypassing the Internet access market by setting $p_A$ so high that demand on that market is zero, or (3) offering a contract, but bypassing the regular telephony market by setting $p_T$ so high that demand on *that* market is zero. The result of Haan's analysis is

[97] Firm *T* needs to set its lump-sum *L* so that firm *A* will just accept it, which results in $L = [(\gamma - p_T)/2]^2$.
[98] Yet even though firm *A* is free to reject the contract of firm T, it appear to be in its best interest to accept.
[99] This assumption may be criticized on the ground that new communication methods that exist through the Internet (such as email and Internet telephony) may actually reduce demand for voice traffic through regular telephony.

that for high enough $\alpha$, as $\gamma$ increases, free Internet access (i.e., $p_A = 0$) will initially be offered. Yet, as the Internet access market increases further, there is a point where firm $T$ changes the terms of the contract offered to the service provider, and induces it to charge $p_A > 0$. As $\gamma$ increases yet further, offering free Internet access becomes again the most favourable option. But this final shift only occurs when the Internet market has grown so large that the market for regular telephony is no longer served. According to this analysis, free Internet may be a temporary phenomenon, depending on the values of parameters $\alpha$ and $\gamma$.

## Appendix H

Quality service indicators for Telecom's performance.

| Quality of Service Indicators (Residential telephone service requests = SRs) | Oct 95 - Mar 96 | Apr 96 - Sep 96 | Oct 96 - Mar 97 | Apr 97 - Sep 97 | Oct 97 - Mar 98 | Apr 98 - Sep 98 | Oct 98 - Mar 99 | Apr 99 - Sep 99 | Oct 99 - Mar 00 | Apr 00 - Sep 00 | Oct 00 - Mar 01 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Percentage of SRs that meet requested installation time | 94 | 93.3 | 90.8 | 90.1 | 87.7 | 89.3 | 93.6 | 89.6 | 88.2 | 88.5 | 87.6 |
| Percentage of "intact" SRs completed within 24 hours of request | 96 | 95.8 | 95.5 | 96.8 | 96.9 | 96.4 | 97.2 | 97.8 | 98.3 | 98.8 | 99.2 |
| Percentage of "intact" SRs not completed within 48 hours of request | 0.7 | 0.7 | 0.8 | 0.7 | 0.8 | 0.7 | 0.4 | 0.5 | 0.5 | 0.3 | 0.2 |
| Percentage of SRs outstanding 96 hours after requested time | 0.7 | 1.0 | 1.5 | 1.7 | 1.5 | 0.9 | 0.5 | 0.7 | 0.6 | 0.3 | 0.2 |
| Faults per 100 residential circuit ends | 41 | 46 | 41.4 | 43.8 | 41.3 | 46 | 40 | 39.5 | 24.3 | 19.3 | 30.7 |
| Percentage of repair commitments that meet the customer's request | 78 | 80 | 80 | 80 | 82 | 84 | 91.3 | 92.7 | 93.8 | 91.5 | 92.0 |
| Percentage of faults cleared within 24 hours | 60 | 54 | 60 | 59 | 67 | 70 | 79.2 | 79.5 | 85.8 | 82.2 | 85.7 |
| Percentage of faults outstanding after 96 hours | 3 | 7.1 | 3.3 | 4.9 | 2.9 | 2.7 | 1.3 | 2.0 | 1.2 | 2.1 | 1.8 |
| Call minutes lost in electronic exchange outages (thousands) | 52 | 27 | 12 | 211 | 54 | 656 | 400 | 398 | 424 | 87 | 160 |
| Number of written residential escalated complaints | 649 | 1130 | 951 | 982 | 1063 | 1168 | 771 | 907 | 201 | 127 | 153 |
| The percentage of (correct residential telephone white page listings / total listings) | 99.96 | 99.95 | 99.95 | 99.97 | 99.94 | 99.98 | 99.85 | 99.91 | 99.89 | 99.93 | 99.93 |
| Number of party-lines | 960 | 808 | 661 | 258 | 251 | 228 | 203 | 200 | 197 | 197 | 194 |
| Average directory assistance answering time (seconds) | 10.6 | 10.5 | 20 | 11.1 | 6.7 | 4.8 | 8 | 7.2 | 7.7 | 6.4 | 7.7 |
| Average time taken to handle directorv | 33 | 33 | 32 | 31 | 29 | 28 | 32.5 | 34 | 29.5 | 29.2 | 28.8 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| assistance calls (seconds); | | | | | | | | | | | |
| Availability of electronic payphones (%) | 98 | 97.7 | 97.9 | 98.4 | 98.2 | 98.6 | 98.7 | 98.8 | 99.4 | 99.4 | 99.4 |
| Local calls lost as percentage of total calls | | | | | | | | | 0.14 | 0.12 | 0.18 |
| 0876 calls lost as percentage of 0867 calls | | | | | | | | | 0.14 | 0.12 | 0.18 |

*Source: Ministry of Economic Development (2001)*

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