

The switch over to digital television in New Zealand

Yasutaka UEDA*

Abstract

The digitization of terrestrial TV broadcasting is an important target in the New Zealand ICT strategy. The diffusion of digital television receivers among households has become a key factor for smooth transition from analog to digital. The object of this paper is to demonstrate whether the digital switchover in New Zealand targeted for completion on December 1, 2013 will be implemented smoothly while referring to the precedent set in Japan. Although a complete nationwide digital switchover was initially planned for one day on July 23, 2011, differing from Japan where digital switchover was implemented in two stages as a result of the effects of the Great East Japan Earthquake, digital switchover in New Zealand will be divided into four stages for each area. Although rural areas will be switched over prior to urban areas, this is in consideration of the delay in the proliferation of digital receivers in urban areas, and as a result, switchover is presumed to proceed smoothly. Although the timing of digital switchover in the U.S. has been delayed twice, it can be expected to be implemented as scheduled in New Zealand. Since the time of the digital switchover in New Zealand is relatively late in comparison with other advanced countries, the price of digital television receivers is already sufficiently low and has reached a level that enables these devices to be easily purchased by residents, thereby serving as another factor indicating that digital switchover will be completed smoothly. Since New Zealand does not charge television receiving fees, universal service is provided in rural areas where average costs (AC) are high as well as low income households, thereby preventing the occurrence of a “digital divide” with respect to differences in location and differences in income. Differing from Japan where the failure to renew NHK subscriptions by 90,000 television viewers resulted in the actualization of a movement away from television viewing, this situation is unlikely to be actualized in New Zealand to any conspicuous degree.

Key Words: digital switchover, analogue switch off-goal, digital divide, free-to view option, digital trend

1. Introduction

The object of this paper is to demonstrate whether the digital switchover in New Zealand targeted for completion on December 1, 2013 will be implemented smoothly. Michael Starks [2007] listed the following five points should be taken into consideration when implementing a digital switchover as contained in his book, “Switching to Digital Television”.¹

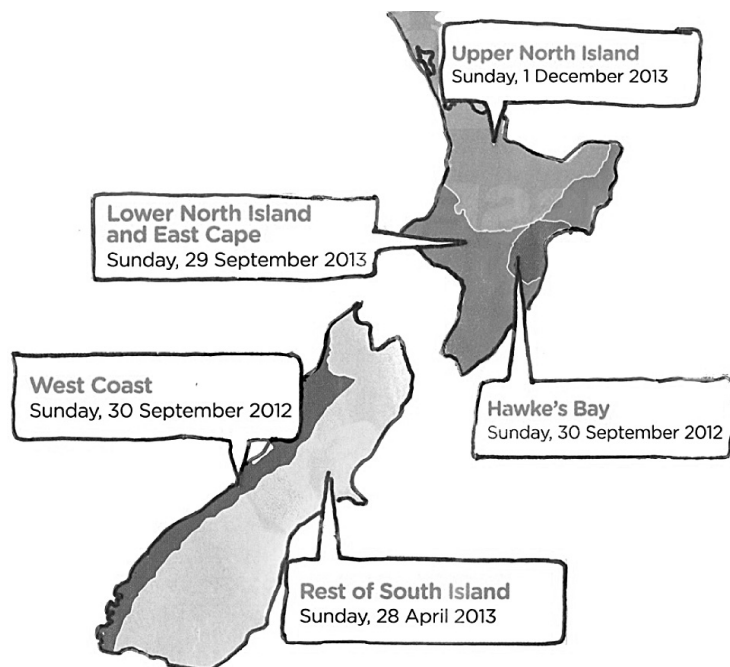
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* 江戸川大学 マス・コミュニケーション学科教授 国際情報通信学博士

1. No country has yet decided to skip digital terrestrial completely, even countries where terrestrial reception plays a very small role.
2. No country has launched digital terrestrial without also adopting an analogue switch-off goal (implying a compulsory final phase).
3. To facilitate analogue switch-off, consumers need to be offered a free-to-view option, usually digital terrestrial and/or free-to-view satellite. It is not, at any rate in the short term, politically realistic to make subscription compulsory.
4. Analogue switch-off dates, which are set politically without regard to consumer take-up, tend to be postponed.
5. Full switchover is generally easier in countries where terrestrial reception is of limited importance and, at least in respect of their main TV set, a relatively small minority of households is affected.²

2. Risk of the Digital Divide

The free digital terrestrial service Freeview NZ, which is broadcast by UHF signal, was launched in April 2008 in nine major areas (Auckland, Hamilton, Tauranga, Napier, Hastings, Palmerston North, Wellington, Christchurch and Dunedin. Subsequently, terrestrial broadcast stations continued to broadcast digital and analogue signals). The timing of the digital switch-over has been respectively determined for all of New Zealand by dividing into five areas as shown in Fig-1. In contrast to analogue broadcasts scheduled to end in rural areas such as West



Source: Sky Watch [2012] 9 p.

Fig-1 Analogue Switch-Off Goal in New Zealand

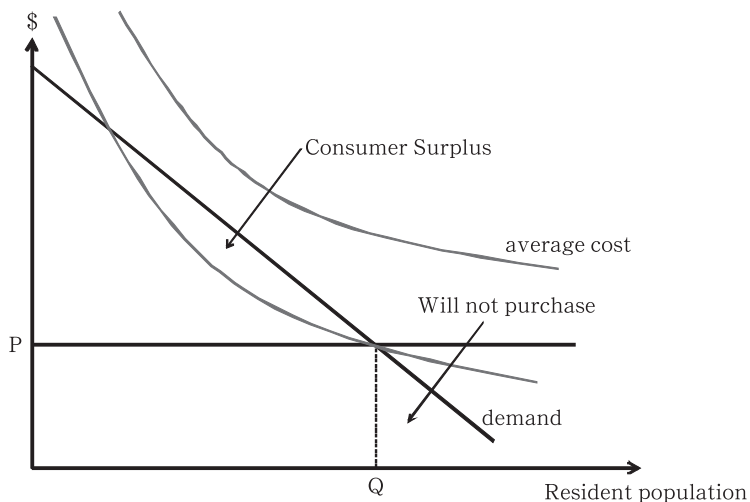
Coast and Hawke's Bay by the end of 2012, analogue broadcasts are scheduled to end for the Rest of South Island area, which includes Christchurch, the Lower North Island area, which includes Wellington, and the Upper North Island area, which includes Auckland, one year later in 2013. Thus, this schedule calls for implementation of the digital switchover in rural areas first followed by urban areas.

New Zealand is small (population 4.4 million), geographically isolated country (it is the world's most isolated developed economy, with its closest neighbor Australia – also relatively small with 22 million people 2,000 km and 3.5 hours flying time away). It is characterized by population density (15 people per square km ? comparable to Finland and Norway) – with even it's most densely-populated area – Auckland – having a comparatively low density by international urban standards (316 per square km – compared to Sydney – its nearest Australian neighbor at 362 and Tokyo at 6,703). It is comprised of two main long narrow islands, both bisected longitudinally by large mountain ranges.³ New Zealand is among the most urbanized societies in the world, with 86 percent of the population living in an urban area at the time of the 2006 census. Main urban areas (places with 30,000 people or more) account for 72 percent of the population, with a further 6 percent residing in secondary urban areas (places with between 10,000 and 29,999 people). The remaining 22 percent of the population live in minor urban areas (8 percent), rural centers (2 percent) and other rural areas (12 percent)⁴. Table-1 shows the details.

Table-1 Resident population of regional council areas

Regional Council area	Resident population
Northland	155,800
Auckland	1,436,500
Waikato	406,500
Bay of Plenty	272,300
Gibson	46,200
Hawke' s Bay	153,400
Taranaki	108,100
Manawatu-Wanganui	230,200
Wellington	478,600
North Island	3,287,700
Tasman	46,800
Nelson	45,000
Marlborough	45,000
West Coast	32,600
Canterbury	559,200
Otago	205,400
Southland	93,500
South Island	1,027,500
New Zealand	4,315,800

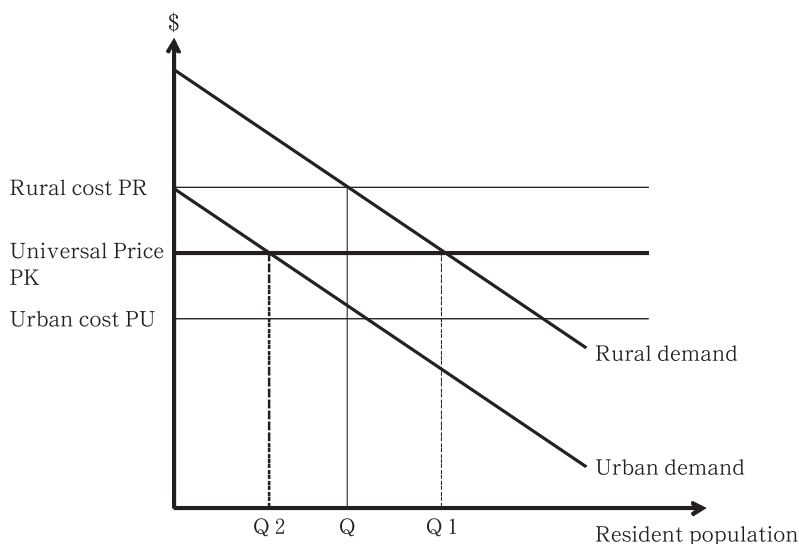
Source : New Zealand official yearbook [2012], 94 p.



Source: Prepared by Ueda with reference to Bronwyn Howell [2012] 156 p. Panel 3

Fig-2 Consumer surplus and Average cost

Fig-2 sets up the model. For simplicity, we assume two customer groups of equal size with demands that are equally elastic (i. e. same slope) but that the higher costs mean the rural customers sits above the urban one. We also assume that there are two different prices reflecting costs (P_R for rural; P_U for urban) that renders each group with identical surplus (Q connections sold in each market at the respective prices, yielding the two identically-sized surplus triangles). In effect, every urban consumer is paired with a rural customer with identical characteristics except for the absolute valuation difference. The surplus outcomes for each member of the pair are identical. On many dimensions, this would be appearing to be a 'fair' outcome.



Source: Prepared by Ueda with reference to Bronwyn Howell [2012] 157 p. Panel 4

Fig-3 Urban demand and Rural demand

Although the average cost (AC) of digital switchover is much higher in rural areas than in urban areas, in the case of New Zealand, since there are no charges for television receiving fees, this cost difference is not manifest in the form of a price difference, thus preventing the formation of a digital divide. On the contrary, the rural demand for easily accessible ICT is greater than the urban demand.

3. Establishment of Analogue Switch-Off Goal

The old analogue television network will be progressively switched off throughout the country during the period from September 30, 2012 to December 1, 2013. This switchover to digital television in New Zealand begins in September 2012. The digital switchover starts in Hawke's Bay and the West Coast on September 30, followed by the remainder of the South Island on April 28, 2013 and the Upper North Island on December 1, 2013. It has been decided that all analogue broadcasts will be terminated on December 1, 2013, and that time signifies completion of the so-called digital switchover. Until that time, all households will have to purchase receives compatible with terrestrial digital television broadcasts as well as make accommodations for those broadcasts with respect to reception equipment including an antenna and compatible indoor wiring.

In the case of Japan, the government initially set the following goals for the proliferation of terrestrial digital broadcasts.

End of March 2010 : 69,600,000 units (81.6%)

End of June 2010 : 75,300,000 units (86.0%)

End of September 2010 : 80,800,00 units (91.0%)

End of December 2010 : 86,300,000 units (96.0%)

However, the actual proliferation rate resulted in an ideal curve as represented by the following figures.

Table-2 Estimated resident population of regional council areas

Region	Geographic Description	Date for Going Digital
West Coast	Haast to Karamea, including Murchison, St Arnaud and Maruia	30th September 2012
Hawke's Bay	Approximately Norsewood to Tutira, including translators dependent on Mt Erin and Mt Threave	30th September 2012
Rest of South Island	South Island (east of) and including Arthur's Pass, south of Haast, north of St Arnaud	28th April 2013
Lower North Island and East Cape	Wellington to Teranaki (Awakino), south of Taumarunui, Ruapehu and to East Cape	29th September 2013
Upper North Island	The reminder of the North Island	1st December 2013

Source : Sky Watch [2012] 9 p.

End of March 2006 : 15.3%
End of March 2007 : 27.8%
End of March 2008 : 43.7%
End of March 2009 : 60.7%
End of March 2010 : 83.8%
End of September 2010 : 90.3%
End of December 2010 : 94.9%

Although proliferation proceeded smoothly in Japan, in contrast to the proliferation rate as of 2009 being only 60% just two years prior to the scheduled completion of analogue switch-off in 2011, in the case of New Zealand, where the timing of the digital switchover is later than that in Japan, the proliferation rate in 2011 two years prior to completion of analogue switch-off has reached 79%, nearly 20 percent higher than that in Japan, thus leading to expectations that digital switchover will take place more smoothly than in Japan.

On the other hand, since television stations will be subjected to greater costs for having to continue to broadcast both digital and analogue signals if there is a delay in the digital switchover, television stations are seeking prompt implementation of digital switchover. In the case of Japan, for example, in the case of digital switchover being extended one year in the three prefectures affected by the earthquake (Iwate, Miyagi and Fukushima prefectures), costs required for repair and maintenance of broadcast equipment as well as running costs were reported to be roughly 400 million yen. If the digital switchover had been delayed for a year in not only those prefectures affected by the earthquake, but also on a nationwide scale, it has been estimated that total costs for both NHK and private broadcasters would have reached 15 billion yen. From this viewpoint as well, analogue switch-off is required to be implemented on schedule in New Zealand as well⁶.

4. Providing of Free-to-View Option without Requiring Additional Costs

In the case of New Zealand, free-to-view satellite service known as “Freeview NZ” is provided free of charge as a free-to-view option. Since digital broadcasting started in December 1998, digital broadcasts can be viewed even with an analogue television receiver by installing a decoder. There is absolutely no need to go rushing out to buy a new TV. Extra TVs in the house that are not connected to or do not include digital technology will not operate after the relevant switchover date. Thus, differing from Japan where the failure to renew NHK subscriptions by 90,000 analogue television viewers resulted in the actualization of a movement away from television viewing, this situation attributable to digital switchover is unlikely to be actualized in New Zealand to any conspicuous degree.

(※) **Freeview** was established in 2007 by New Zealand’s free-to-air broadcasters, including TVNZ, Mediaworks TV (owner of TV 3 and C 4), Maori Television, and Radio New Zealand, to offer a free digital television service. To watch programs broadcast on Freeview, viewers must have a television

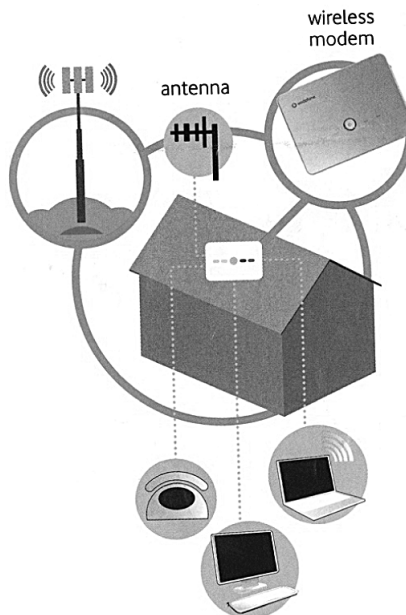
with an inbuilt digital receiver; or a digital set-top box, along with either a satellite dish or a UHF aerial.

5. Understanding Digital Switchover

The move from analogue to digital TV will have huge benefits for New Zealanders, including improved reception, particularly in areas where analogue signals are difficult to get. One aspect of the significance of switching terrestrial broadcasts from analogue to digital lies in improvement of viewer convenience, including the providing of high-quality video and audio services and enhancement of data broadcasting services. In addition, due to the higher levels of sophistication of increasingly personalized televisions, a readily accessible ICT infrastructure will be formed that combines televisions with Internet applications, and this is also expected to contribute to elimination of the “digital divide”.

In addition, frequency bands freed up as a result of the digital switchover will be able to be used effectively in other service fields such as mobile broadband services⁷. Since these digital trends will provide information relating to trends in other countries where digital switchover has already taken place, this will provide an even greater awareness among the people of New Zealand.

Furthermore, with respect to the time of implementation of digital switchover, a flexible approach was adopted in the U. K. where a criterion was first established calling for a digital receiver proliferation rate of 95%, and the actual date of digital switchover was only finalized when that level of proliferation had been attained. In addition, in the U. S. where digital switch-



Source: Sky Watch [2012] 9 p.

Fig-4 Digital TV as ICT infrastructure

over of terrestrial television broadcasts began in 1998, the initial time of digital switchover set for 2007 was delayed until 2009 due to the proliferation of digital receivers not proceeding as expected. In Japan as well, although there were opinions insisting that the time of digital switchover should be determined at the state the proliferation rate reached 85%, ultimately a transitional approach was adopted that divided the implementation process into stages, with the final stage being completed on July 23, 2011. Since an obligation to ensure proliferation enabling television to be viewed universally throughout Japan is defined in the Broadcast act for the purpose of NHK, the approach of transmitting 100% digital broadcasts to all areas covered by analogue broadcasts has been clearly defined with respect to the digital switchover as well.

In August 2009, the New Zealand government established an administrative organization known as "Freeview" for promoting complete digitalization of television broadcasting in a joint effort with the broadcasting industry, and although it had adopted a policy calling for the timing of complete transition to digital broadcasting to be proposed as a result of conducting a comprehensive examination in consideration of such factors as the state of proliferation of digital broadcasting, the state of installation of digital equipment, and the progress being made in other countries, based on a survey result indicating that the proliferation rate of digital televisions had reached 70% of all households in September 2009, it decided to move up the termination of analog broadcasting to end of December 1, 2013. Public information activities are being deployed in New Zealand as well so that citizens will be made fully aware of the date of digital switchover. Government support for a public information campaign, All this work will be managed by the Ministry for Culture and Heritage.⁸

6. Accommodation of Lower Income Households

In the case of New Zealand, the television receiving fee system was previously abolished on July 1, 2000, and the public broadcaster, TVNZ, is currently operating primarily through funding from advertising and commercial income⁹. Consequently, viewers not subscribing to pay TV programming are not required to pay for TV viewing. In the case of Japan, on the other hand, in the case of newly purchasing a digital television receiver, since the majority of receivers are equipped with a satellite reception function, in addition to the price of the television receiver itself, it is also necessary to conclude a satellite broadcast viewing contract with NHK. Since free-to-view satellite service is not provided in Japan as it is in New Zealand, this resulted in a considerable discrepancy in digital television receiver proliferation rates attributable to differences in annual income levels one year prior to digital switchover. For example, although the proliferation rate reached 91.2% among households having an annual income in excess of 10 million yen, the proliferation rate among households having an annual income of less than 2 million yen was only 67.5%, which was 16.4% below the average.

Less than 2 million yen : 67.5%

2 to 4 million yen : 80.4%

4 to 6 million yen : 84.6%

6 to 8 million yen : 87.0%

8 to 10 million yen : 89.6%

More than 10 million yen : 91.2%

National average : 83.8%

As a result, the numbers of households that decided to forego attempting to accommodate the digital switchover and terminate their viewing contract with NHK were as indicated below.

July 2011 : 49,904 households

August 2011 : 41,458 households

Total : 91,362 households

Roughly 10,000 of these households terminated both satellite and terrestrial viewing agreements (monthly charge: 2,290 yen), while the remaining roughly 80,000 households terminated only their terrestrial viewing contracts (monthly charge: 1,345 yen). These 90,000 some households constituted those households that moved away from television viewing due to the digital switchover.

Table-3 Income Structures of Public Broadcasters in Various Countries

Income Structures	TV Broadcasters
Public broadcasters operating through subsidies and advertising fees	Taiwan : TBS Australia : SBS (Special Broadcasting Service) Spain : RTVE, SEPI New Zealand : TVNZ (Television New Zealand)
Public broadcasters operating through subsidies and donations	USA : PBS (Public Broadcasting Service), CPB, PTV, NPR Australia : ABC (Australia Broadcasting Corporation)
Public broadcasters operating through federal government subsidies	Canada : CBC (Canadian Broadcasting Corporation) Indonesia : TVRI (Televisi Republic Indonesia)
Public broadcasters operating through receiving fees only	Japan : NHK (Nippon Hoso Kyokai, or Japanese Broadcasting Corporation) UK : BBC (British Broadcasting Corporation) Denmark : TV 2 Sweden : SVT (Sveriges Television) Norway : NRK (Norsk Riskringkasting) Finland : YLE (Yleisradio Oy)
Public broadcasters operating through receiving fees and advertising fees	Korea : KBS (Korean Broadcasting System) Germany : ARD,ZDF France : France Television France 2, France 3, France 4, France 5 Italy : RAI Ireland : RTE (Radio Teilifis Eireann) Iceland : RUV Sri Lanka : SLRC (Sri Lanka Rupavahini Corporation), ITN (Independent Television Network)

Source : Prepared by Ueda with reference to NHK Data book [2012]

Table-4 TV receiving fees in Europe and Japan (2011~2012)

Country name	TV receiving fees (Jyen)
Switzerland	¥40,671
Norway	¥35,576
Denmark	¥33,827
Austria	¥29,586
Finland	¥26,970
Sweden	¥24,906
Germany	¥23,068
UK	¥18,624
Ireland	¥17,107
France	¥13,364
Italy	¥11,974
Cheko	¥ 6,717
Japan	¥16,140

※1 £ = Jyen 128, 1 £ = 1.20 €, 1 N \$ = Jyen 70

Source : Prepared by Ueda with reference to NHK

Data book [2012]

(※) **NHK** (Nippon Hoso Kyokai, or Japanese Broadcasting Corporation) was originally based on the BBC model. It was set up in the radio era as a public-service system financed by license fees. These voluntary payments, called “receiving fees”, come from thousands of fee collectors who appeal to the Japanese sense of honor and civic duty as they go door-to-door throughout Japan. NHK sets its own fees, subject to government approval; presently, the monthly fee is 1,225 yen (less than 18 N \$) per household for one or more color TV sets (if paid six months or a year in advance, and slightly discounted if paid by bank transfer or through a postal money order). A household with a satellite pays nearly twice as much: 2,170 yen (31 N \$). Nearly all of NHK’s revenue comes from either government subsidies or set license fees: Annual operating income for fiscal year 2011 was over 699 billion yen, with 96.1 percent of this money from receiving fees (672 billion yen). Fully three quarters of this money is spent on program production and transmission.

7. Conclusion

As a result of verifying the five points listed by Michael Starks [2007] that should be taken into consideration when implementing a digital switchover, all five requirements were determined to be satisfied.

With respect to the first point, since digital switchover will be implemented at a time that is relatively late in comparison with other advanced countries, and the price of digital television receivers is sufficiently low and has reached a level that enables these devices to be purchased easily, the proliferation rate of digital receives is already high. Again, since digital switchover will be implemented at a time that is relatively late in comparison with other advanced countries, and the price of digital television receivers is sufficiently low and has reached a level that enables these devices to be purchased easily, this will contribute to a smooth digital switchover. In

addition, since New Zealand does not charge television receiving fees, universal service is provided in rural areas where average costs (AC) are high, thereby eliminating the potential for the occurrence of a digital divide attributable to regional differences.

With respect to the second point, the analogue switch-off goal has been set for December 1, 2013. Differing from Japan where a complete nationwide digital switchover was initially planned for one day on July 23, 2011, although it was ultimately implemented in two stages as a result of the effects of the Great East Japan Earthquake, digital switchover in New Zealand will be divided into four stages. Although rural areas will be switched over prior to urban areas, this is in consideration of the delay in the proliferation of digital receivers in urban areas, and as a result, switchover is presumed to proceed smoothly.

With respect to the third point, in the case of New Zealand, free-to-view satellite service known as "Freeview NZ" is provided free of charge as a free-to-view option¹¹. Since digital broadcasting started in December 1998, digital broadcasts can be viewed even with an analogue television receiver by installing a decoder¹².

With respect to the fourth point, since digital switchover will be implemented at a time that is relatively late in comparison with other advanced countries, there is a greater understanding of its significance among viewers. Although digital switchover was delayed twice in the U. S. and once in Japan (but only in some areas due to the effects of the Great East Japan Earthquake), digital switchover in New Zealand can most likely be expected to proceed on schedule. There is also little risk of the occurrence of a digital divide between rural areas and urban areas.

With respect to the fifth point, since the public broadcaster, TVNZ, is currently operating primarily through funding from advertising and commercial income, viewers are able to view terrestrial digital broadcasts free of charge. Since New Zealand does not charge television receiving fees, universal service is also provided to low income households, thereby preventing the occurrence of a digital divide with respect to differences in income.

Notes

- 1 In 2005 Michael Starks was invited to talk to a seminar of New Zealand civil servants and broadcasters who wanted to know how transferable the UK experience was to New Zealand. His answer was that, looking at the varied pattern of digital television around the globe, it was becoming possible to distinguish between factors specific to particular national markets and some emerging common principles. Market specific factors were very important (so New Zealand needed to analyze its own market, not simply copy the UK). (Michael Starks [2007], 196 p.)
- 2 Michael Starks [2007], pp. 196–197
- 3 Bronwyn Howell [2012], 132 p.
- 4 Recent trends are for immisubsidies and returning New Zealanders to be more likely to settle in a main urban area. While the urban share of the population has increased only very slowly, the exchange of people within and between areas has been dramatic. Rural areas are not necessarily in remote locations. Much of the rural population growth follows from the popularity of lifestyle blocks and similar developments, in areas classified as rural, but which are in close proximity to urban areas. Rural areas that are more remote from cities have experienced static or declining populations in recent years.
- 5 It is important to note that the areas shown in Table-2 describe the expected areas in which digital switch over will occur. In some areas, viewers may receive their signals from a site than that identified by the radio engineers.

- 6 Government support for digital switchover began in 2007, with support of the Freeview digital platform and the provision of funding to Television New Zealand (TVNZ) for two advertising-free, digital-only channels.
- 7 There are benefits from greater services available from digital services and the opportunity to relocate approximately 100 MHz of ultra high frequency (UHF) spectrum to other economic activity.
- 8 *New Zealand official year book 2010*, 221 p.
- 9 Television began in the early 1960s and was funded by a mix of license fees and advertising revenue. Market-led, openly commercial television began in earnest in the late 1980s as part of broader free market reforms deregulation. Television New Zealand, the two-channel state-owned enterprise (SOE), obliged to return regular dividends to its shareholder, the government of the day. Foreign-owned private broadcasters entered the market (assisted by the removal of any restrictions on ownership of television), and Pay TV was launched. The resulting mix was characterized by fierce competition for income and viewers and by the middle of the 1990s it could be argued that, with ample justification New Zealand's broadcasting environment is now the most deregulated in the world.
- 10 Howard J. Blumentahl & Oliver R. Goodenough [2005], 480 p.
- 11 "Freeview NZ" has been transmitting in digital since 1998, meaning digital TV is already available nationwide.
- 12 Sky Marketing Manager Aaron Stone says the Digital Switch Over couldn't be easier for SKY subscribers. "There's absolutely no need to go rushing out to buy a new TV", he says. "When the switch over happens in your region, just turn on your TV as you normally would and continue to enjoy all of the benefits SKY customers currently enjoy."

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