

# Challenges Facing the Cable Television (CATV) Industry in an Effort to Create Survival Business Models: Region-based and Region-expansion Business Strategies and Government Assistance Policies

by Sayaka SHIOTANI\*

## Introduction

This paper explores whether the CATV businesses which have enjoyed governmental protection to date will play a role as part of the information and communication infrastructure in the age of multimedia. This paper also examines whether the expansion model and region-based services are the right strategies for the CATV industry for its survival, and whether governmental assistance would lead to a viable development of the industry. These issues will be examined in detail below.

There are few preceding empirical research papers on this subject, besides Jitsuzumi & Nakamura (1999 & 2003). Other research papers have touched upon the merging of the broadcasting and telecommunications, the fiercely competitive entry from telecommunication businesses, or support systems, but not in detail. The author and the group involved is now conducting quantitative empirical analysis on the management policy, and will discuss the management policy and the government support system further. As a first step, this paper will recount the recent trends about digitalization and the merging of the broadcasting and telecommunications, and conduct qualitative analysis on the need for an expansion strategy and the direction in which the governmental support system should be headed.

## Overview of the CATV Industry

Japan's CATV industry has developed based on such a business model as retransmission of traditional TV companies' terrestrial waves to each household through cables. Due to its role retransmitting terrestrial waves to areas where

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people have difficulty in receiving airwaves directly, CATV has enjoyed public assistance including the establishment of a retransmission network which required massive initial investment, assistance for the measures for addressing the difficulty of receiving airwaves and broadcasting services, and preferential tax treatment from central and local governments. In addition, three quarters of CATV operators are mixed public-private entities. This shows that the CATV industry depends on governmental support substantially. This also indicates that CATV businesses tend to take the form of mixed public-private entity in order to receive public assistance.

The background has brought about the situation where more than sixty percent of CATV operators register accumulated losses, which highlights CATV's high dependency on public assistance, while 80 percent of CATV operators register annual profits in recent years (See Table 1). Among CATV operators, there remains a great gap in their size, and their dependency ratio on governmental measures.

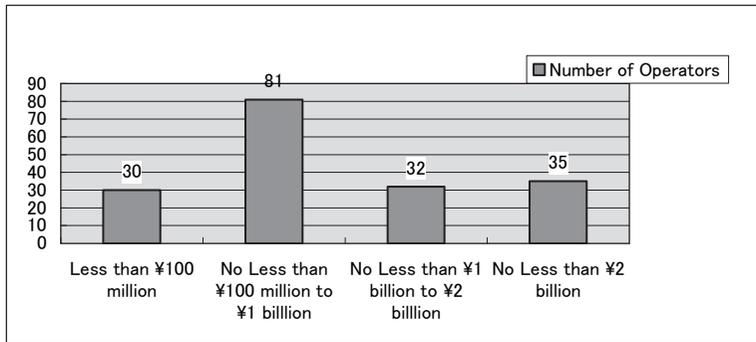
Table 1: Financial Situation of CATV Operators

	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Number of operators	311	317	314	314	312	310	311
Number of operators registering profit in a fiscal year	196 (63.0%)	201 (63.4%)	216 (68.8%)	242 (77.1%)	250 (80.1%)	251 (81.0%)	245 (78.8%)
Number of operators registering accumulated deficits	236 (75.9%)	233 (73.5%)	225 (71.7%)	214 (68.2%)	200 (64.1%)	183 (59.0%)	n.a

Source: Prepared based on data from "The Report by the Div. of Regional Broadcasting Services, Bureau of Information and Communication Policy, the Ministry of Internal Affairs and Communications" (2004-2007).

CATV subscribers have increased in number in recent years. At the end of the fiscal year 2006, the number of CATV subscribers reached 20.63 million: an increase of 7.7 percent over the previous fiscal year<sup>1</sup>. Against that background, optimists argue that "CATV will play a role as an information and telecommunication infrastructure in the multimedia age"<sup>2</sup>, a transformation from its current role as infrastructure which provides a two-way, high-speed, large-volume access network to each household at a low cost. I will examine below whether such a view should hold in reality.

Figure 1: Number of CATV Operators According to Capital Size  
(Among 201 Operators)



Source: prepared based on “The Report by the Study Group on CATV” (2004).

## Rapid Change in the Environment Surrounding the CATV Industry

### *Changes in the Market Environment*

#### **Increased Competition for CATV**

The CATV industry is undergoing a rapid change in its environment. In the area of broadcasting, satellite digital broadcasting and terrestrial digital broadcasting as multi-channel broadcasting media are expanding. In addition, gas, electrical or railroad operators which have their own track networks are planning to enter the CATV industry<sup>3</sup>. Law Concerning Broadcast on Telecommunications Service, which has been in effect since 2002, provides an opportunity for operators which do not own transmission infrastructure to engage in broadcasting, making use of the existing infrastructure of telecommunications operators. It also provides an opportunity for telecommunications operators to engage in broadcasting services. Since then, telecommunications operators have started the transmission of images, making use of IP technology through FTTH or ADSL(broadband broadcasting services)<sup>4</sup>.

It is increasingly important for the management of the CATV industry to expand the transmission infrastructure as much as possible in an effort to adapt itself to the competitive environment. The choice is whether to use hybrid fiber-copper (HFC), as an extension of their own existing transmission networks, or whether to rent FTTH which electronic, railroad, gas, or telecommunication companies such as NTT have already installed. While their own individual investment in HFC could be burdensome for small-size operators, the existing characteristics of CATV, such as closed networking and two-way communications would be maintained. On the other hand, while the use of FTTH would lead to less expense for infrastructure

investment and maintenance fees for CATV operators, it would be difficult to hold onto the existing CATV business model, i.e. retransmission of broadcasting to the limited area through their own transmission network..

### **CATV's Entry into the Communications Field**

When broadband services initially started in Japan, the prospects for CATV were considered bright due to its potential as an Internet provider through the existing transmission network, and as a multi-purpose player that bundled telephone, data and video services. However, the number of Internet users through CATV has stagnated in recent years. At the end of the fiscal year 2006, the number of CATV Internet users was 385 million. The number of ADSL network subscribers surpassed that of CATV in 2001. The increase ratio of subscribers is higher in FTTH than CATV; many are switching away from the CATV Internet to FTTH<sup>5</sup>.

Some reasons can be cited here. First, CATV operators have a disadvantage in their networking capabilities due to the relatively small business size as compared with that of the Internet providers. Second, major providers are conducting energetic sales promotions in an effort to expand ADSL subscribers. Third, CATV operators have not chosen a policy of allowing users to have an option only for the Internet. Fourth, CATV operators have not been able to offer the same level of software programs, as compared with the Internet providers. Fifth, the speed of the existing CATV network is 30 Mbps, which is slower than that of FTTH's 100Mbps.

In addition, CATV operators have a disadvantage in IP telephone services, as long as CATV uses the closed existing regional HFC network, since its free telephone area is limited in scope. The prospect of CATV's IP telephone is not bright, since its limited scope of free services are not attractive for subscribers. On the other hand, IP telephone services thorough ADSL and FTTH have great advantages over those through CATV, since they can offer a wider area for free telephone services due to the nation-wide network.

All the above suggest that, in order for region-based CATV operators to gain added value, it would be essential for them to have a nation-wide network through business partnerships.

### **Digitalization of Analog Terrestrial TV Services**

There appears to be some adverse effects that the digitalization of terrestrial TV services may cause to CATV operators. While the effects will not be clear until its actual development, it is often said that terrestrial digital broadcasting services may have advantages in addressing the difficulty of airwave transmission. If that is the case, there would be more likelihood that the areas now having difficulty in clear reception of terrestrial analog TV airwaves could receive clear airwaves directly. The costs of addressing the difficulty in reception of TV airwaves, which, in turn, have accounted for the CATV operators' revenues in large part, might be affected

if a majority of CATV viewers in the regions where they face difficulty in receiving terrestrial airwave would switch to direct digitalized broadcasting services. In addition, since the digitalization makes more multi-channeled broadcasting services possible than now available, there would be no incentive for consumers to continue to subscribe a set sales of 20 channeled broadcasting services which CATV operators supply today. In sum, the digitalization of terrestrial TV services could result in fundamentally unraveling the basis for CATV operators' business model to date, i.e., the retransmission of terrestrial broadcasting services.

Second, the digitalization of terrestrial TV may trigger the question as to whether the same rule of the analogue broadcasting should apply to CATV in such areas as retransmission<sup>6</sup>. In fact, a question arises as to whether terrestrial TV stations which provide CATV with TV contents should allow digitalized transmission to be transformed into analogue transmission in the area of their affiliated regional broadcasting services. While analogue retransmission would need additional investment, it would not be able to offer subscribers digital TV's added services, and therefore runs counter to a policy of promote digitalization. Thus, in recent years, the terrestrial TV stations have demanded a pass-through<sup>7</sup> system, which does not allow any change in digitalized retransmission by CATV operators. On the other hand, under a pass-through system, the possibility arises as to whether CATV operators would not be able to collect fees from subscribers through the existing set-top boxes, and the subscribers would be more aware of the cost accrued from retransmission of terrestrial broadcasting<sup>8</sup>.

### **Need to Alleviate a Gap in Reception of TV**

While CATV has so far played a role of alleviating the difficulty faced by a region in terms of clear reception of TV airwaves, this role is coming to an end. The CATV industry, which has enjoyed a provision of governmental subsidies and assistance in the name of alleviating a gap in receiving TV broadcasting, needs to address its dependent proclivity in the increasingly competitive market.

### *Advantage of CATV in Doubt*

As the market environment changes, there arises a question as to whether the existing advantage of CATV will remain intact. In the following, the issues surrounding that question will be considered.

### **CATV's Function of Two-way Information Transmission**

The major characteristic of CATV networks is to establish two way information networks with broadband which can be utilized for communication and broadcasting services, through stable copper transmission networks. While terrestrial broadcasting, broadcasting satellite and communications satellite

services have difficulty in providing two-way communication services, CATV can provide video-on-demand services<sup>9</sup>, on-line shopping, on-the-household welfare services and the effective dissemination and feedback about regional governmental information in times of natural disaster, with its two-way communication capabilities. However, CATV operators which provide individual broadcasting services have not offered contents which utilize its two-way communication capabilities. Further, broadband broadcasting services which utilize FTTH as a transmission network which possesses stable two-way communication capabilities can become a formidable competitor for CATV.

### **Existing Well-Established Transmission Networks**

It is often said that CATV has an advantage in that it employs an existing well-established transmission network system. To be sure, theoretically, the broadband services which utilize ADSL, which has the same characteristics of employing the existing network, can provide two-way communication services. However, unlike FTTH network, it can hardly provide high quality TV image of terrestrial broadcasting, since its networks, i.e., telephone lines, have a limited wavelength available, and are frequently interrupted by other packet data, due to its IP specifications.

On the other hand, since FTTH has a two-way, stable image quality, CATV operators which do not own the existing networks could join the market, renting the FTTH networks. These CATV operators which do not possess the existing networks, could be exempt from costs involving the infrastructure and human resource investment to establish and maintain their own transmission network and develop their own technicians. The CATV operators' advantage of owning their own existing transmission network could be diminished, as the FTTH networks expand.

### **Treatment of Network Security and Copyrights**

In view of the network security, it is advantageous for CATV operators to provide secure networks, employing closed transmission networks through copper cable. Therefore, the content owners with copyright can safely provide their contents. Operators using their own fixed networks such as CATV are allowed to deal with copyright issues in a comprehensive manner, while broadband broadcasting service operators employing the IP multi-cast system need to acquire permission from copyright holders individually prior to the transmission, since such broadband services are categorized as telecommunication services under the Copyright Law. This is a very cumbersome process for these broadband providers. Accordingly, unlike eoT.V., and OPCAS, which provide broadcasting services based on the QAM system and obtain retransmission agreements by separating image transmission from IP communication, broadcasting operators using the IP

multi-cast system such as BBTB and Fiber-Plus TV, cannot obtain retransmission agreements from the terrestrial broadcasting service companies, and therefore provide a limited number of channels, as compared with CATV using their own network. The above point symbolizes that the issue of system remains as an obstacle, even if the gap between communication and broadcasting services are narrowed technologically.

On the other hand, a question arises for CATV operators as to how they can address the issue of diluting the closed environment as one of the major CATV features, as they expand their networks, in an effort to engage in the Internet and IP telephone services. Further, CATV operators using FTTH as a retransmission network cannot offer a closed environment. In other words, while it is essential for region-based CATV operators to maintain closed networks, they may face a choice whether or not they should maintain the networks of the closed environment, as the need to expand the networks increases.

### **Region-based Transmission**

While CATV's region-based characteristics will be discussed in detail below, it can safely be said that CATV is mostly transmitting governmental and regional information in a one-way direction, therefore does not utilize its unique characteristics of two-way transmission. The establishment of an e-government or e-regional municipality is under process centering upon its communications base. It can also be pointed out that, in an emergency such as an earthquake, CATV's transmission network could be fragile. In addition, as the merger of local authorities proceeds further, there may be discrepancies between the scope of newly merged local authorities and that of the existing CATV business area.

In sum, in a changing environment CATV's advantages such as owning its own transmission network are increasingly put in question, as the communications industry expands its presence in the area of broadcasting under the trend of mergers between the broadcasting and communications businesses. In addition, in the foreseeable future digitalization might fundamentally unravel CATV's core business model, i.e., retransmission of terrestrial TV services. It may be undeniable that, over time, the environment surrounding CATV industry would be increasingly fierce.

On the other hand, while CATV still has an advantage over broadcasting services under the copyright system, other advantages such as two-way transmission or possession of its own transmission networks could be diluted with an expansion of FTTH networks. Furthermore, the advantage of establishing a secure network due to its closed network system could be contradictory to an expansion of its networks. Also, the region-based transmission is not satisfactory. Overall, CATV's advantages are now in doubt.

## Evaluation of the Expansion Strategy and Region-based Strategy

As was discussed in the previous section, in a fast-changing environment the CATV industry is losing its existing advantages or is not in a position to exploit its potential to the fullest. Presently, the CATV industry is facing up to these challenges through expanding its scope of targeted areas and promoting region-based characteristics further. In this section, the seemingly contradictory two directions of strategies, i.e., the expansion of areas and the promotion of its region-based characteristics will be assessed in a qualitative manner. It is hoped that this qualitative approach will serve as a basis for future quantitative approach.

### *Assessment of Expansion Strategy*

#### **Inadequate Size of CATV Business**

In order for the CATV industry to address today's urgent issues, it is imperative to expand its business size, in that its management resources are exceedingly inadequate in terms of human, financial, and technological resources. These issues include those such as how to promote infrastructure investment to promote digitalization of terrestrial broadcasting, how to compete with broadband broadcasting services, how to introduce advanced security technology, and how to establish a technology development system in order to provide advanced services such as PPV, VOD, dissemination of regional governmental information, or electronic commercial transactions. It may also be beneficial for the CATV industry to expand its business size in an effort to consolidate its customer base, increase commercial revenues, and strengthen its content procurement capabilities through increasing its bargaining power with content providers.

According to Jitsuzumi & Nakamura (1999 & 2003) which assessed CATV's business size and its management effectiveness, it is estimated that the most effective size for the CATV industry is that of 40,000 to 200,000 household subscribers<sup>10</sup>. Presently, the ratio of CATV operators whose subscribers are over 50,000 out of all the members of the Japan CATV Association is merely 20%<sup>11</sup>. Accordingly, a majority of operators do not reach the optimum business size. The promotion of expanding business size is still considered to be an effective business strategy in CATV industry.

#### **Various Forms of Expansion: Strengthening of Capital Relations (Merger) or that of Business Partnership**

In order to achieve network expansion, besides the business size expansion through strengthening capital relations, there is an approach to promote business partnership through such methods as joint use of head end among CATV operators, merger of reception device infrastructure and an establishment of platform for management, administration, surcharge and certification systems of CATV. While

there may be cases where, in view of management strategy, the promotion of capital relations is considered to be harmful to CATV's region-based characteristics, there may be others where the systematic aspects such as public subsidies to CATV operators have been influential. The CATV industry, where its permit is originally issued to a single operator in a single administrative area, may have cases where the public-owned CATV system, intervention by local authorities, and public support systems adversely affect the expansion strategy, even though deregulation enables CATV operators to expand their target area under a permit system. While there is such an operator as ZTV which materialized its expansion strategy at the time of deregulation, a majority of CATV operators remain relatively small-sized, and stay in a single administrative area. This is reflective of the background aspects described above.

### *Assessing CATV's Role as a Region-based Media*

#### **Coordinating CATV's Region-based Characteristics and its Expansion Strategy**

Various efforts have been underway to coordinate CATV's two seemingly contradictory future directions: the region-based market segmentation approach and comprehensive expansion approach. In some cases, CATV's expanded network has been utilized in order to promote region-based transmission for locally initiated contents. For example, in Oita Prefecture, the idea of "networking CATV operators" has been launched in an effort to share image data among CATV operators and give a stimulus to the region through transmitting locally produced programs to other regions with networking<sup>12</sup>. In Tottori Prefecture, Chukai TV, with governmental assistance, promotes its locally produced programs to a national audience through a communication satellite<sup>13</sup>. In Hokkaido, Obihiro CATV is forming a partnership with a local newspaper, its parent company<sup>14</sup>.

#### **Improving CATV's Region-based Characteristics**

As a marketing strategy to improve relations with the region, CATV operators need to enhance their role as media to help promote togetherness as a regional community through regional information transmission. Besides the live broadcasting of local J-League team games and that of local tournaments of high school baseball, there emerge such programs as local lifestyle information programs and local weather forecasting services. In some cases, locally initiated voluntary programs are being broadcasted<sup>15</sup>. Further, CATV can play an information hub role as a clearing house of local information, if CATV's characteristics as a two-way transmission media are utilized. In particular, CATV as a two-way transmission media has great potential in such ways as: the establishment of in-house health management systems through CATV in sanitary, welfare, medical fields; the promotion of information exchanges and life-long education by linking various

advanced educational institutions and research institutes; the expedited information dissemination system in cases of natural disasters; and the industrial promotion through promoting governmental information. While it cannot be safely said that the CATV has managed to exploit its two-way transmission capabilities in providing its contents, it is indispensable for CATV to offer region-based contents through fully utilizing its two-way transmission capabilities, in an effort to distinguish itself from other media or providers.

In summary, since CATV operators have not reached their optimum business size, the business expansion is still an effective management strategy. CATV operators need to face up to challenges of promoting region-based characteristics and expand their network and business at the same time.

## Public Assistance to the CATV Industry

Government assistance has played an important role in the CATV industry. In fact, in view of the public interest that information and communications infrastructure should be established, and that regional disparities should be addressed including areas of difficult transmission, the central and local governments have provided various forms of assistance to the CATV industry.

However, as the CATV industry transforms itself towards more expansion and promotion of its regional character, the assistance policy should be changed as well. Subsidies to projects where there is no particular justification should not be continued. Even if there is reasonable ground for governmental assistance, such assistance should not be rendered to CATV operators in areas where the nature and scope of such assistance address the difficulties which their managers themselves should be responsible for. Such assistance may result in inefficient management and misplaced management strategies.

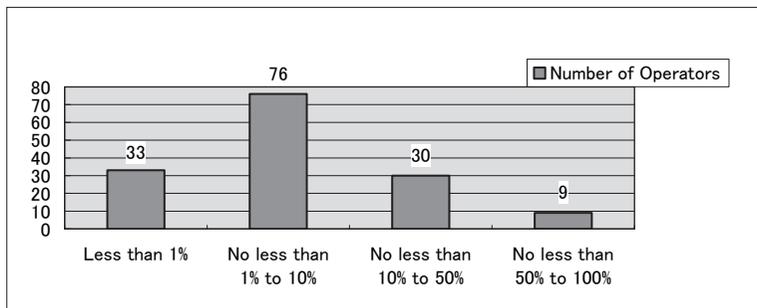
This chapter will consider the merits and demerits of governmental assistance policies as a first step in discussion of the assistance policies. It is hoped that this deliberation will pave the way for the forthcoming, specific recommendations.

### *The State of Play*

First, in regard to the public nature of CATV, Specific Rate Support Grants are provided by the Ministry of Internal Affairs and Communications to local authorities in order to make up for the expenses of governmental information programs, based on a judgment that programs such as live broadcasting of parliamentary deliberations are intrinsically public in nature. In view of alleviating regional disparities in the broadcasting infrastructure, preferential financial and tax treatment are provided to CATV operators including mixed public-private entities, by the Ministry of Internal Affairs and Communications. In cases where local

authorities engage in the CATV business through general account budgets, rather than the establishment of the mixed public-private entities, they are designated as “a project for enhancing regional information and communication”, and bonds for stimulating the regional economy and for budget appropriations are provided. In addition, subsidies are granted to local authorities and agricultural cooperatives by the central government (the Ministry of Agriculture, Forestry and Fisheries) for those projects designated as “a project for enhancing regional information and communication”.

Figure 2: The Ratio of Government Support in the Capital of CATV Operators



Source: prepared based on “The Report by the Study Group on CATV” (2004).

### *Issues of Governmental Assistance System and the Directions for Reform*

The governmental assistance system is one of the measures that are available to the government to intervene in the market to make sure that goods and services are provided below market prices. Thus, there should be justifiable reasons for the government to intervene in the market with subsidies. Due to the limited scope of this paper, detailed deliberations about the adequacy of the governmental assistance will be discussed in other publications. For these deliberations, two aspects of the external effects and income redistribution effects should be mentioned.

As for the external effects, there may be regional development effects, which may be considered as common elements in regional infrastructure industries such as communications and broadcasting services. These effects, however, are commonly seen in broadcasting and communications services, and are not unique to CATV, since, there exist other services such as CS, BS and broadband broadcasting services, today.

As to redistribution effects deriving from the universal nature and scope of services, since the measures for universal services in broadcasting and

communications services are seen not only in CATV but also in CS, BS, broadband and other various broadcasting services, it would be difficult to justify such indirect income transfers which are only available for CATV, not equally applicable to other services.

Second, the current governmental assistance system has a problem that the assistance is basically limited to local authorities and mixed public-private entities. This would create a bias that the CATV business is prone to take a managerial form of public sector, and lead to a decreased managerial effectiveness through the fixed form of CATV business entities, and create a disincentive against mergers and acquisitions toward the expansion of CATV business size. There is no particular need to limit CATV-related subsidies to the public sectors. In other fields such as bus and railroads, private operators are also granted subsidies.

Third, there is a question whether the individual CATV-related subsidies system according to governmental jurisdiction such as that of the Ministry of Internal Affairs and Communications and that of the Ministry of Agriculture, Forestry and Fisheries would adversely affect comprehensive and effective assistance.

Fourth, under the current governmental assistance system, subsidies and low-interest loans mostly take the form of capital subsidies that can be only applicable to infrastructure investment. The subsidies only available for infrastructure could create a bias toward unnecessarily redundant infrastructure investment and adversely affect optimum resource allocation.

In view of the above, there emerges a prospective direction for reform: a change to a system where, instead of ministry-based subsidies, government subsidies shall be incorporated into the Rate Support Grant, and local authorities can select the most efficient operators or services. In other words, it is important to leave local authorities with options to choose high-speed communications services that they prefer including CATV, and provide the sort of assistance (including public subsidies or tax preferences) that is necessary. In a reformed system, an option utilizing subsidies to promote village relocations may be available for local authorities in their efforts to take steps to lower costs.

Such a reform, by enabling local authorities to select which management form or operators to which they should provide assistance, would eliminate biased distributions of subsidies according to different forms of management of CATV operators and induce more competition among media and operators. As competition grows with other communications operators, it is about time for CATV operators to start its own soul-searching in an effort to survive through self-help effort, instead of sticking to the status quo and depending on governmental assistance.

## Conclusion

The qualitative analysis above was offered regarding CATV's strategic agenda and the assistance policy to the CATV industry. The author and the author's group intend to shed more light on these issues through the on going research. Some of the most important issues about the CATV's forthcoming business model include: further substantiation on the expansion-model hypothesis through hearings with individual CATV operators and quantitative analysis on their management; proposals for management strategies which synthesize the seemingly contradictory directions, i.e., the expansion-model strategy and region-based approach; and proposals for specific public assistance policies towards the CATV industry.

First of all, as digitalization expands, there is a need to proceed with the quantitative analysis on the effectiveness of the approach toward the economy of scale through mergers and acquisitions among CATV operators, taking into account a developments since Jitsuzumi & Nakamura (2003) which utilized data from 1997. While a clear direction is yet to be seen on questions such as how far the CATV's expansion should be promoted, and whether such an expansion strategy should be conducted through the strengthening of capital-to-capital relations such as mergers and acquisitions, or the alliance partnership should be promoted by way of further rationalization of operations, these questions are to be further considered based on hearings with individual operators and corporations.

In addition, while the region-based approach is not a clearly defined concept, it is desirable that this concept be clearly delineated, if possible, based on the quantitative approach. MSO's management strategy should be discussed distinctively, while, in this paper, this strategy is referred to as a part of the expansion strategy.

Furthermore, the public assistance policy should be given further consideration in an effort to review the justifications of such an assistance policy, and the ways to identify policies that give incentives to more effective management and to prevent the misuse of public subsidies, based on the real management data should be explored.

## NOTES

1. Regional Broadcasting Division, Information and Communications Policy Bureau (2007). The number would be increased to 28.75 million households (a 4.8% increase over the previous fiscal year), with an addition of households which subscribe only to retransmission of airwaves.
2. Regional Broadcasting Division, Information and Communications Policy Bureau (2002)
3. For example, Tepco Cable TV by Tokyo Gas Co..
4. Law Concerning Broadcast on Telecommunications Service enables BBTB based on IP multi- cast through ADSL, Optic plus TV based on IP multicast with FTTH, eoT.V. of Kansai Electronics Co. affiliates based on QAM and OPCAS of Sky Perfect TV affiliates based on QAM. Among these media services, eoT.V. and OPCAS provide similar services to CATV in that they retransmit terrestrial and satellite broadcasting.
5. As of November, 2003, 24% of CATV subscribers switched from CATV to FTTH (Ministry of Internal Affairs and Communications (2004)).
6. Cable Television Broadcast Law (1972) introduced the retransmission agreement system in an effort to create an order in which terrestrial TV services and CATV coexist. With a retransmission agreement required, the law aimed at preventing an unauthorized change in the contents of terrestrial TV services. On the other hand, in cases where CATV operators are not able to obtain a retransmission agreement of terrestrial TV companies, according to Article 13 of the Cable Television Broadcast Law, the compulsory system of arbitration by the Minister of Post and Communications (Internal Affairs and Communications) was introduced in May, 1986.
7. “Pass through” is a system where broadcast signals received by airwaves can transmit to the CATV system the same broadcast signals, with the same or changed wavelengths.
8. Mori (2004).
9. At the same time, *Satellite & CATV*, March 2005, points out that there is no successful business model for VOD, in its special edition titled “Starting VOD Services”.
10. Jitsuzumi & Nakamura (1999 & 2003).
11. Study Group on CATV (2004).
12. Handa (2004).
13. “Satellite and Communications Co.” is a mixed public-private company established by Chukai TV. It was established with initial capital of ¥31 million in 1998, with the help of government funding. It received ¥30 million in loans as a result of its designation under the Promotion of Creative Activities of Tottori Prefecture, and ¥390 million in loans for subsidies under a scheme of the Promotion of Establishing Infrastructure of Advanced Application. In

addition, its capital was increased to ¥230 million, since it received additional funding from the Telecommunications Venture Investment Association, and as a result it was designated as an applicable new enterprise under the “Promotion of Developing Specific Communication and Broadcasting Services Law” by the Ministry of Internal Affairs and Communications. With the help of this support, the company aims at nation-wide broadcasting and networking (“*Satellite and CATV*”, January, 2005, pp. 40-41).

14. “*Satellite and CATV*”, August, 2004, pp. 53-57.
15. Chukai TV case is a good example (Takahashi (2004)).

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