A Critical Analysis of Public Service Broadcasting in a Digital Environment
-Its changing role in Japan from the international comparative viewpoint-

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Introduction

Digital technology is rapidly changing the environment within which the broadcasting industry operates, especially public service broadcasting (PSB). Now, a television program can be viewed from a mobile phone, and phone calls can be made through cable networks. Moreover, Internet is the spawning ground for a wide diversity of new industries that promote convergence between broadcasting, telecom and information industries.

The objective of this paper is to evaluate the socio-economic dimensions of PSB in a world where innovation, liberalization and deregulation are facilitating the expansion of competition. Japan is our primary focus even though we are concerned by PSB's transformation in Europe and North America.[1] We analyse PSB's unique socio-economic characteristics and formulate an analytical framework to better identify the key issues to be addressed in the policy process.

As in the most European countries, Japan's broadcasting has had a dual system; on one hand, Japan has commercial broadcasters financed by advertising revenues and, on the other hand, it has one public service broadcaster, NHK (Japan Broadcasting Corporation). NHK's financing has been based on a rather unique mechanism, namely, a voluntary payment of license fees by viewers. Thanks to entry regulations, the Japanese broadcasting market has effectively evolved into a "cosy duopoly" that has remained sheltered from effective competition for half a century. However, changes such as the growth of multi-channel broadcasting, the introduction of pay television, and the advent

[1] See Martin Cave and Kiyoshi Nakamura ed., ***Digital Broadcasting: Policy and Practice in the Americas, Europe and Japan,*** Edward Elgar, 2006, about the general effect of digital technology on broadcasting in details.

of the Internet are shaking the very foundation of this historical system. The emergence of new content distributors, particularly the Internet service providers, and the growth of broadband networks are accelerating the process, challenging not only NHK but also the incumbent commercial broadcasters. The privileged status of incumbents is increasingly eroded by additional factors such as the entry of these "new species" of content providers as well as the appearance of self-broadcasting approaches such as blogging and social networking. That new situation can be traced to a digital convergence of broadcasting, telecommunications and information industries that has been accelerating in recent years. It raises fundamental questions about the growing conflict between existing regulations and the economic efficiency of the sector. More basically, one wants to evaluate what the future role of PSB should be in this emerging environment. The policy implications of those fundamental changes need to be debated. We may point out that the need for such a debate is not unique to Japan.

Today's core socio-economic question is whether or not PSB as we know it has become "an ordinary economic good", i.e., a service most efficiently provided through the market. In sharp contrast to the United States, Japan and European countries look at the cohesion of the society and the preservation of the national identity as important policy objectives. However, as Armstrong and Weeds (2005) suggests, when "digital broadcasting is less prone to traditional market failures and will supply the programmes that viewers broadly wish to watch"[2], there is an urgent need to reconsider the rationale of "market failure" for PSB.

The paper, first, reviews the studies on the value of PSB, which were mainly conducted in UK and Japan. Second, it examines the impact of digital convergence on PSB. Third, it discusses the rationale for PSB in today's context as well as policy options. Finally, we comment on PSB's changing role in the digital age.

1 The Value of Public Service Broadcasting

1.1 International Comparison

Most countries emphasize PSB's social, educational and cultural role, especially society's desire to use PSB as a tool to protect its cohesion and its national heritage. This helps understand Chandler's (1969) suggestion that "structure follows strategy", where the structure of public service broadcasting relies on how each nation interprets the value of its strategic involvement in social, economic and cultural affairs.

[2] Armstrong, M. & H. Weed(2005)

There are several options to structure PSB but all of those are heavily shaped by the way those broadcasters are funded. There are at least five broad funding options that may be available to individual PSB depending upon the governance they operate under. Those are in turn advertising revenues earned the same way as commercial broadcasters, direct government subsidies that are generally national but could be on occasion regional, private fees paid by viewers on some basis, say, in terms of their radio and/or television set and private donations negotiated between the broadcaster and individual viewers and/or supporting firms. For instance, the Swedish PSB is fully subsidized by the national government. In some countries such as Portugal some of the PSB comes from the government while the rest is obtained through ads in competition with the private sector. NHK's revenue for satellite services comes from regular pay-TV fees as if NHK was a not-for-profit PBS. The U.K. transposed to the BBC Marconi's original payment system, when broadcasting was still a privately-owned system. That system consists in a compulsory fee, based upon the number of radio or television sets. That system does not differ all that much from today's pay-TV system. However, as noted by Lipsey (2004), it is a regressive fee since it applies to everyone who wants to listen to radio/watch television, regardless of the time spent listening/watching. The same principle can also work on a contract basis as it has function for over half a century in Japan. The last system is also a voluntary system. The essential difference is that the broadcaster has to allocate time to remind listeners/viewers that there is a need to contribute to the system to keep it afloat. This system is unique to NPR and PBS in the U.S. Table 1 shows the summary of public service broadcasting among major nations.

Figure 1, based on a 1999 study McKinsey prepared for Ofcom, shows the link between the funding mechanism and the quantity of PSB-type program genres. In that study, McKinsey found a very strong correlation between broadcasters who had a secure, predictable government funding were providing far more PSB-genre programs to their viewers. McKinsey's results have to be interpreted with some care since it reflects the programs that are broadcasted rather than the public's willingness to watch those programs.[3]

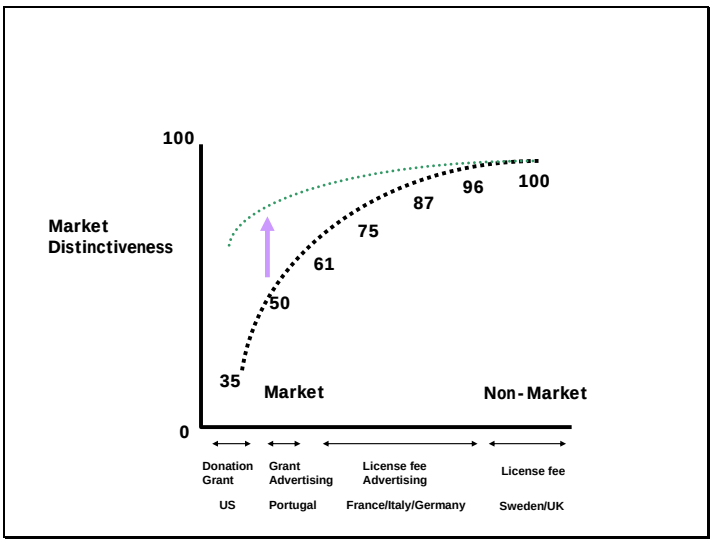
[3] According to McKinsey's data, in contrast with UK, U.S. audience watch a fair amount of public service-type programs such as the History Channel or the Discovery Channel provided by the private sector.

Table 1: Public Service Broadcasting Around the World

Country	Public Service Broadcaster	# of Channel T: Terrestrial S: Satellite M: Mobile	Channel Names	Funding System	Payment (license Fees/ Total Revenue) Year
UK	BBC	T:8	BBC1,BBC2, BBC3, BBC4, CBBC, Cbeebies, BBC News24, BBC Parliament	License Fees	Mandatory (76%) FY2003
Japan	NHK	T:2; S:3	NHK1, NHK2, BS1,BS2,BShi	License Fees	Voluntary (89.5%) FY2005
Korea	KBS EBS Mobile Broadcasters	T:6; M:6	KBS1, KBS2, EBS1, EBS2, KBS-M, MBC-M, SBS-M, Three other Mobile Broadcasters	License Fees Advertising	Mandatory (KBS:39.3%) FY2003
France	France Television	T:4; S:1	F2, F3, F5, ARTE	License Fees Advertising	Mandatory (65.4%) FY2005
Germany	ARD ZDF	ARD T:11; S:3 ZDF T:1; S:3	ARD, MDR, NDR, RBB, Berlin, RBB Brandenburg, Sudwestfernsehen, WDR, ZDF, ZDF Dokukanal, ZDF Infokanal, ARTE, Phoenix, KIKA, 3Sat	License Fees Advertising	Mandatory (ARD::82.5%) FY2003 (ZDF::84.7%) FY2002
Italy	RAI	T:3; S:3	Rai 1, Rai 2, Rai 3, Rai News 24, Rai Sport, Rai Educational 1, Educational 2	License Fees Advertising	Mandatory (59.4%) FY2003
USA	PBS	349 stations		Donation Grant	Voluntary

Source: The NHK Broadcasting Culture Research Institute, ***Report on Research and Study on Funding of Public Broadcasting around the World***, June 2005 and others.

Figure 1: Effect of Funding on Supply of Public Service Programs
-McKinsey & Company Study (1999)-



Source: Adapted from **Public Service Broadcasters around the World**
A McKinsey Report for the BBC, January 1999, McKinsey & Company
Note: The distinctiveness of a market is defined the percentage of factual, cultural and children's programs broadcast by the principal broadcasters in the market (public service and commercial), weighted by their audience share. Data as of September 1998. The dotted line suggests the possibility that digital innovation could enhance the market supply of PSB-type programs.

1.2 Recent Studies on the Value of Public Service Broadcasting

There are many attempts to evaluate the value of public service broadcasting.[4] Although the various methods have been used in the previous research, most of them tried to estimate willingness to pay or broadcaster values.

1.2. 1 BBC Case[5]

[4] The seminal work on willingness to pay to broadcasting was carried out by Bohm (1972). He tried to ascertain the demand for television programs produced by a Swedish public broadcaster.
[5] BBC published a study report titled "Building public value", in June 2004 in trying "to show how an independently and effectively governed BBC, focused on its vision and its values yet open – to new ideas, to justified criticism, above all to the views and priorities of its audiences-could play a decisive role in establishing public value in this new digital world".

One of most the comprehensive studies to assess the value of a public broadcaster was carried out by BBC (2004) in "Measuring the value of the BBC: A report by the BBC and Human Capital".[6] The purposes of the research was to investigate from the perspective of individual viewers (1) their willingness-to-pay for BBC programs, (2) the value of the availability of the BBC, and (3) how a compulsory subscription system affected how people valued the BBC.[7] The research emphasizes investigating the value not only for individuals as consumers through their willingness to pay (WTP) but also as citizens through their willingness to accept (WTA). Since how the current funding system should be supported is the most important question at issue, both people's WTP if the same services are provided through markets and socio-economic values to the country as a whole were investigated.

The methods adopted in the study sought to estimate those values from both a "top-down" and a "bottom-up" perspective in order to try to reinforce the reliability, hence, credibility of the study. The "top-down" method used dialogue-type questions with viewers to estimate the total value by adding up each value of individual programs. The "bottom-up" method evaluates directly, through a first impression the value of the BBC to individuals.

BBC estimated the top-down value by measuring the consumer value through the Gabor-Granger method[8] and national voting question. The former indicates how much people as consumers would be willing to pay for a subscription to all programs BBC offers. The latter suggests how much they would be pay to buy back BBC if it would stop their services.

They used two analytical methods for the bottom up valuation: conjoint analysis and non-normalised chip allocation. Conjoint analysis examines values people place on different bundles of services. The method estimates the relative importance of various BBC services. In the non-normalized chip allocation method, respondents are asked how they allocate the total value among the various programs. That method produces more intuitive values for individual BBC services.

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[6] Prior to this study, Ehrenberg and Mills (1990) attempted to estimate viewers' willingness to pay. They concluded that "viewers are willing to pay far higher prices the current license fee", and they are insensitive "price increases up to some £200 a year".

[7] The willingness-to-pay is based on the assumption that all individuals are "neoclassical" individuals who maximize their own welfare independently of other individuals. The discrepancies between those core, neoclassical assumptions and experimental data have been well-known for a long time. They have led Kahneman and Tversky (1979) to develop an approach largely free from those problems, they call "prospect theory".

[8] See Gabor and Granger (1961).

According to the study, the total and consumer values of the BBC were estimated, for the first, at £20.70 and £23.50 and, for the consumer value, at £18.35 and £18.70. On average, at the estimates were between £18 (about $23) and £24 (about $31) per month, almost double the current £10 monthly license fee. The demand curves for the BBC services were estimated for the total and consumer values respectively to show what the subscription-based welfare losses meant for each of the BBC and its audience respective.

The study shows the highest willingness to pay for such genres as news, regional news and soaps are considered, a result that is consistent with McKinsey (2004). It also showed a high willingness to pay for home-produced programs such as British comedies, drama and films, once again arriving at the same conclusion as the Ofcom study. Those results indicate that the general public benefit from their trust in the BBC news as well as the quality they associate with the BBC's brand.

1.2.2 NHK Case

As of 2006, NHK, Japan's PSB, reaches 84% of Japanese households (39.5 million households). It is supported by voluntary contributions by households and firms that own a television set. That contribution is called the "reception fee."[9] It is an approach that was adopted to insure impartiality and independence from political pressures as well as the ability to bring in talents and produce high quality in programming. The funding mechanism that worked for over 50 years worked well to protect NHK from both government and advertisers' intrusion into content.

Japan's Broadcasting Law in 1950, Article 32, stipulates that individuals with a television and/or a radio can voluntarily pay a "reception fee". Satellite broadcasting is excluded because NHK, just like any pay TV provider, has no problem charging a fee since the satellite channels are encrypted. NHK's satellite service is rather unique as a PSB service in as much as it is structured as a conventional commercial pay-TV service.

Japanese households are asked to contribute ¥1,395 ($11) per month for terrestrial television. If they choose also choose to subscribe to NHK's satellite programs, they have to pay an additional ¥945 per month ($8). As a large fraction of Japanese households subscribe to NHK's satellite programs, a Japanese household's typical monthly charge is ¥2,340 ($19). Evidently, the two charges have a very different meaning since the pay-TV charge for the viewing of satellite programs has the same characteristics as conventional commercial services.

[9] Strictly speaking, the legislation refers to "a receiving equipment capable of receiving NHK terrestrial signals".

NHK has also been interested in the valuation of the corporation as well as the valuation of the various classes of programs it offers. This has led it to follow the BBC and carry out its own contingent valuation survey. NHK has followed the BBC's methodology.[10] In that study as in the BBC study, the respondents were asked both what their WTP and WTA vis a vis NHK and its various genres. However, the outcome of NHK differs in one major way from the BBC study. In contrast to the U.K., a high percentage of respondents were unwilling to say how much they should be compensated if NHK were to go out of business. This meant that NHK was unable to establish the Japanese WTA. The research found that NHK was valued, as in the U.K., above what the respondents are paying today. On average, their response suggested that they would be willing to pay ¥1,780 ($16) for terrestrial broadcasting and ¥1,245 ($11) for satellite broadcasting.

There is a considerable amount of experimental evidence that Hardin's (1968) "tragedy of the commons" is hardly the norm and that systems based on voluntary participation are often stable mechanisms, as discussed in Hardin (1998), Ostrom (2000) and Bourdeau de Fontenay et al. (2005). In fact, most markets need some degree of non-excludability to insure the exchange of information that is required to properly function. Interestingly enough, some free-riding typically takes place but it is limited and does not impede the functioning of the market, though depending on the relative size of free riders to the total participants. Japan's experience with NHK is one of many experiences that attest to that result.

However, the sustainability of some level of free-riding is very sensitive to changes in opportunistic behaviour and it is those changes that can bring about the end of such a system. This is what we can observe with NHK where repeated embezzlement and misallocation of cost have undermined the public trust over the last few years, i.e., the willingness of individuals to contribute voluntarily to sustain NHK. This is demonstrated by the 30% of the population who has chosen to stop contributing to NHK's "reception fee". The problem has been made even more complex with the rapid convergence of broadcasting and telecommunications raising fundamental questions about NHK's future organization and governance.

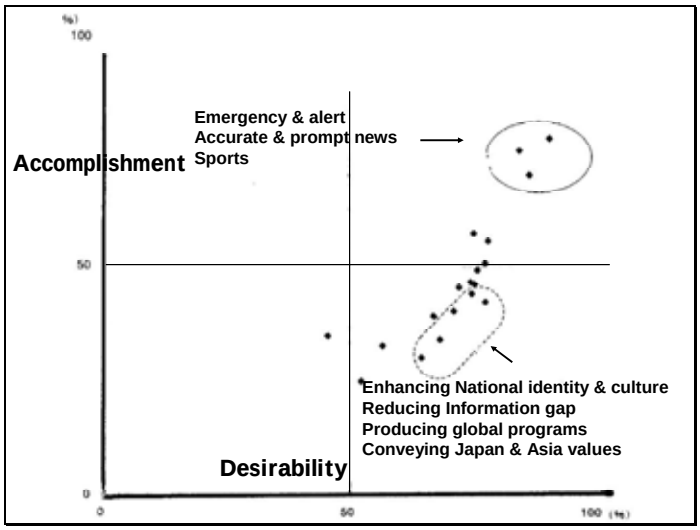
As reported in Figure 2, the researchers also investigated NHK's role as a public broadcaster and to what extent NHK has met its public mandate.[11] Figure 2

[10] NHK published "The Report of the Evaluation on NHK's Promises," June 27, 2006. The research involved interviews with 2018 people in Japan, investigating how much people think NHK is worth.

[11] As indicated in BBC's "Measuring the Value of the BBC," some respondents tend to take a paternalistic approach rather than a libertarian approach, particularly in Japan.

reports the extent to which what NHK had been able to achieve met what individuals were looking for. The vertical axis denotes the respondents' ranking score (% unit) of NHK's track record in meeting its public service obligations. The horizontal axis indicates the respondents' ranking score (% unit) about the desirability level NHK should pursue the public purposes. In short, the diagram shows comparison of "what NHK ought to be" with "what it has accomplished".

Figure 2: Evaluating NHK Programs



Source: NHK (2006) "The Report of the Evaluation on NHK's Promises," June 27, 2006.

Obviously people's expectation of NHK varies among the respondents. As indicated in the first Quadrant, the respondents are satisfied with NHK's provision of emergency and alert-related news, accurate and prompt news, and sports. However, the third quadrant shows that there is a gap between the programs NHK offers and the kinds of programs respondents expect. Particularly people hope to watch programs that enhance national identity and culture, reduce asymmetry of information among the public, offer innovative and creative programs, supply programs that have a global appeal and disseminate Japanese and Asian values. In sum, people are satisfied by NHK's provision of basic PSB-type services. However, this is not true for NHK's entertainment services; on the whole, less than half of the viewers are satisfied with those programs.[12]

[12] We must realize that "to give people what is good for them" is totally different from "to give people what they want".

1.3 Comments on the Value Studies

When market data on public goods are not available, it is now common to construct a hypothetical market for the public goods in order to estimate individual's willingness to pay for it and compute a demand curve. The above-mentioned studies are based on the contingent valuation or survey approach method. They provide with the quantitative information on the value of public service broadcasting that greatly contribute to the rigorous argument for its benefits.

As Cornes and Sander (1986) summarizes, the contingent valuation method must, (1) "be designed that will ask the respondents to value a hypothetical scenario", (2) "contain a mechanism whereby the respondent's value is recorded", (3) "ask questions about the socio-economic characteristics of the respondents", and (4) "be administered in a fashion that will minimize bias". There has been a long debate on the ability of contingent valuation method to yield reliable results, since surveys "are bound to exhibit sensitivity of response to the framing of questions and the order in which they are asked", as pointed out by Arrow et all (1993). This concern is often referred as "framing problem" or "embedding effect".

One of the critical issues concerning the contingent valuation is whether people may or may not reveal their true preferences. The preference revelation problem, as Cornes and Sander (1986) discuss, "may also hamper the use of contingent valuation by inducing strategic behaviour on the part of respondents". The respondents may face prisoner's dilemma. As Cornes and Sander (1986) suggest, if the respondents anticipate that they may bear additional burdens, "they may underestimate their true bids, hoping that others might bid more".

Moreover, even though the respondents reveal their preferences, they tend to take into account whether it is consumed now or in the future. They also consider whether or not it is useful for the future generation. This is related to option value where uncertainty plays a considerable role, as Weisbrod (1964) pointed out more than a half decade ago.[13] Although the BBC study has attempted to avoid this issue by taking into account the difference between the citizen value and the consumer value, since the respondents have no information about costs of production, it may affect their preferences. Those considerations make it difficult to clarify their true preference.

[13] Krutilla(1976) indicated the importance of "existence value" in the case of natural environment preservation. In the case of NHK study on willingness to accept (WTA), half of the correspondents rejected to answer to the question how much they should be compensated if NHK stops their services. It suggests that it is extremely difficult to know the existence value of NHK.

It is obvious that while the costs of a public service broadcaster can be calculated easily, the benefits are far less clear. However, when the availability of public service programs through markets are promoting, it is essential for us to investigate whether the programs supplied by public service broadcasters are worth for money.[14]

2 The Effects of Digital Impact on Public Service Broadcasting

2.1 Public Service Broadcasting under Digital Environment

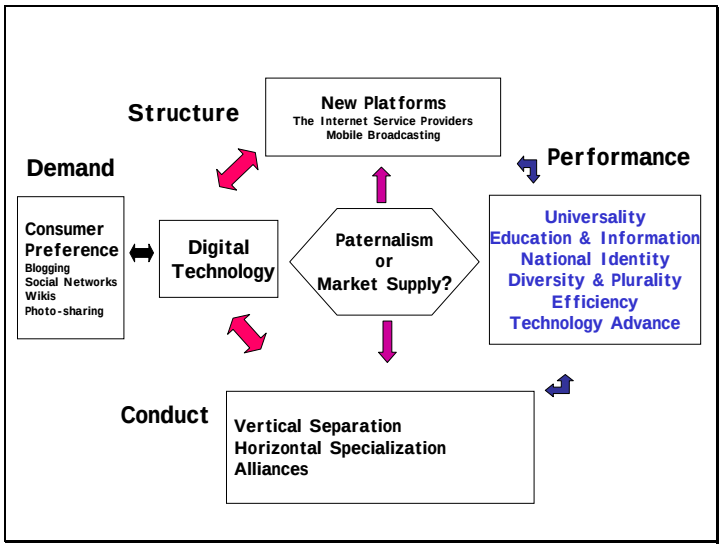
Figure 3 summarizes the current impact of the digital revolution on PSB from an industrial organization perspective. It suggests that digital technologies are transforming simultaneously both market structure and market conduct and that this impacts market performance in such a way that changes in market performance also influence policy options. Thanks to digital technological advances, new platforms such as the Internet Service providers and mobile broadcasters are emerging and those in turn are changing the number and size of players in the broadcasting market. At the same time, those new players are seeking to achieve greater economies of scale that could give them a comparative advantage over competitors. Those strategies focus on vertical integration, horizontal specialization, and/or alliances.

The interaction between market structure and market conduct impact the market performance in domains that are central to PSB, say, providing services that promote universality to all, inform and educate people, cater to a plurality and diversity of interests and tastes. In addition, there is a feedback mechanism from market performance to both market structure and market conduct. Given the nature of the digital revolution, this complex process takes place in an environment where it is increasingly difficult to define the relevant market and, in the present context, to isolate broadcasting from other activities.

Digital innovation and the new business opportunities undermine the government's ability to use existing paradigms in order to regulate and control this emerging world. Flodvary and Klien (2003), for instance, speculate that the government will be forced to shift from preventive policies to defensive function.

[14] As Arrow et all (1993) indicated, it is important to think of "the degree to which respondents have been induced to consider alternative uses of fund and take the proposed payment vehicle seriously", although "a well-conducted CV (contingent valuation) provides an adequately reliable benchmark to begin such arguments".

Figure 3: Digital Impacts on Public Service Broadcasting



2.2 Drastic Changes in Consumer Behaviour

The rapid change in the environment surrounding broadcasting means that the digital technology is blurring the market boundaries between broadcasting, telecommunications and computers making the traditional definition of broadcasting obsolete. More concretely, such convergence means that the market for broadcasting is being integrated into the much broader digital communications market where, for instance, one will find shading that will make it more and more hard to differentiate between conventional broadcasting and other "functions" such as narrowcasting, streaming, and blogging.

Today, current regulations and existing laws are alone in failing to recognize that evolution. The policy formulation process is seemingly unaware of the dichotomy between, on one hand, the rigid, unchanging nature of the inherited legal and regulatory framework and, on the other hand, the advancement of digital technology. It is not just that the technology is changing but people are also active participants in those changes. In many cases, the public's response to new technologies is proactive, deciding what it is best designed to do and reshaping as, for instances with blogging and peer-to-peer. Current regulations and existing laws are operating as if the world was static, unchanging. The economic consequences of that state of affairs are serious because those laws and regulation are becoming impediments in that they place artificial constraints on the normal socioeconomic process through which we can learn how to

make the best use of this advances. The outcome creates economic inefficiencies as technologies and people adjust to bypass those constraints.

Thanks to the development of broadband network and the wide use of the Internet, it becomes easier to enter and compete in markets. The rapid pace of technological changes means that even where firms are able to achieve some market power that power is under constant threat coming from new innovations and new business strategies. As extensively discussed in Young (1928) and Romer (1990), the dynamic nature of innovation and the unique nature of digital goods means that the competition is not as much Schumpeter's gale of creative destruction, i.e., a succession of monopolies unsetting other monopolies but one of explosive innovation that never really allow stakeholders to become monopolies. Even if high technology firms are particularly alert to change, as Christensen (1997) indicates, this is reinforced by the challenge they face in combining the ability to run operational function efficiently while being able to know when to cannibalise their own operations in favour of new innovations. This is not to say that established players such as broadcasters do not still have considerable power, but they are increasingly like Nebuchadnezzar's statue with a head of gold and feet of clay. They may even see the changes that are transforming the industry but this often does make their response efficient.[15]

In places such as the United States, one can almost talk of a "digitalized" invisible hand through which commercial firms are now using the market to supply more and more PBS-like programs. The US experience suggests that this process will be greatly facilitated by the growing role of multi-channel broadcasting. The impact of the further convergence made possible by the Internet is hard to predict. Nevertheless, if we go by today's experience, it also seems likely that it will further weaken existing possibilities of market failure for that small kernel of PBS-type programs that won't be provided through the market.

Because of melting boundaries and changes in entry conditions, the number and the size of the players, not only commercial broadcasters but also the Internet service providers, will continue to evolve. As long as the innovative process continues, what will matter will not be so much the number of firms as the pace firms will become established and established firms will fade away. That process will impact on all broadcaster, whether they are commercial or PBS.

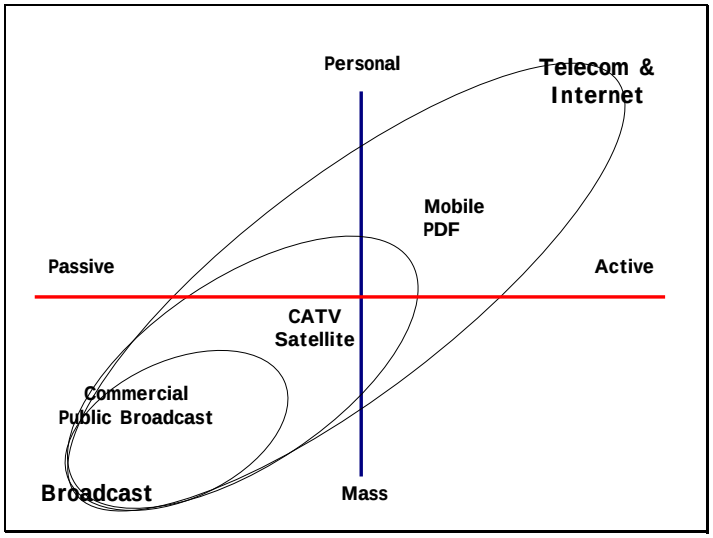
The transformation of a sector is never unidirectional, from technology to demand and consumer response. Rather consumer behaviour impacts the invention entrepreneurs chooses to implement as innovations, creating a feedback mechanism

[15] See Sull(2004).

between technology and demand. This means that there will be rapid changes individual consumer needs and interests that will continuously reshape demand the way technology is reshaping the provision of services.

Those changes in demand are unlikely to eliminate conventional, one-way listening/viewing. However, as we observe with innovation such as TiVO and streaming, one-way, passive consumption of broadcasting-like services will change in ways that are hard to foresee, contributing to weakening the conventional provision of services through established broadcasters.

Figure 4: Changes in Consumer Behaviour



Source: SkyPerfTV, Japan

While passive reception is likely to remain a major part of broadcasting, consumer will demand variety and flexibility. In addition, the limited experience we have to date tell us that two-way, interactive services will be playing a major role in this emerging world. Such demand for interactivity can be expected to have an even more radical impact on today's broadcasting sector, accelerating at levels that are core for broadcasters the convergence broadcasting, telecommunications and computing. The horizontal axis in Figure 4 notes the growing consumer demand for active services. In addition the expected transformation of the access to passive services will also move passive viewing in that direction. The vertical axis in Figure 4 also indicates that consumers are viewed as individuals in some time and they behave as mass in other time. Figure 4 as a whole suggests the interaction between technological advances on

the supply side and consumers behaviours on the demand side. Digital innovation has been creating the movement from Quadrant III to Quadrant I. When consumer behaviour is changing, the traditional "market failure" rationales also seem to fall away.

2.3 The Effect of Digital Innovation on Public Service Broadcasting

As we have discussed above, digital innovation brings drastic changes in the environment surrounding broadcasting industry. Especially digital compression technology enable broadcasters convey high definition channel or multi channels using the current spectrum width. The multi-channel broadcasting makes it possible for commercial broadcasters to provide public service-type of programs to consumer segments that do not have to be all that large. There is no risk in assuming that this trend will result in a growing competition between many if not most programs that were exclusively offered through PBS. This trend means that the historical undersupply of public service programs, a major economic rationale for the public service broadcasting in the analogue era, will cease to be a public concern.

Figure 5: The Effect of Multi-Channel

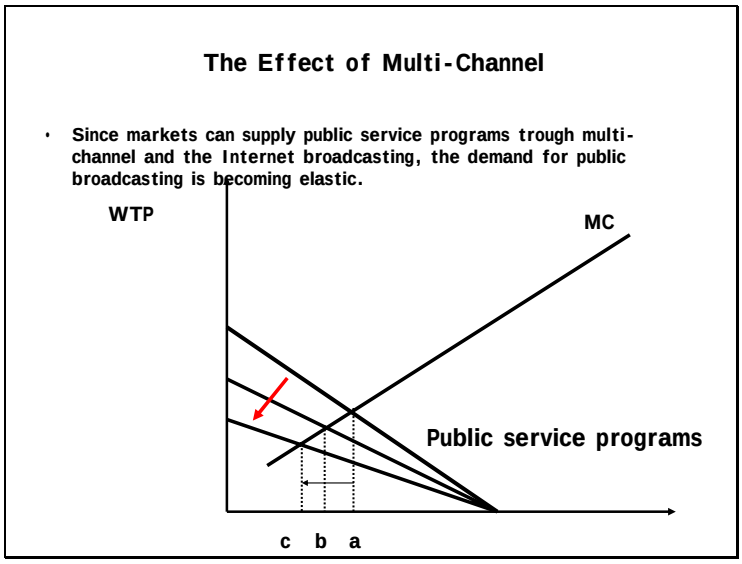


Figure 5 illustrates that belief, namely the way the multi-channel, commercial provision of services is gradually competing more and more with a large portion, possibly all PBS-types of programs. Since digital technology makes those types of commercial services a close substitute for existing PBS programs, this process should

also increase the WTP for PSB-supplied programs. In other words, the multi-channel environment should undermine the market failure argument for a majority of those programs that are offered today by public service broadcaster.

Figure 6 suggests that social preferences may also be influenced by digital innovation due to the increasing availability through commercial broadcasters. Since it is impossible to obtain the social preference profiles, it only provides a conceptual idea.[16]

Figure 6: Shifts in Social Preferences

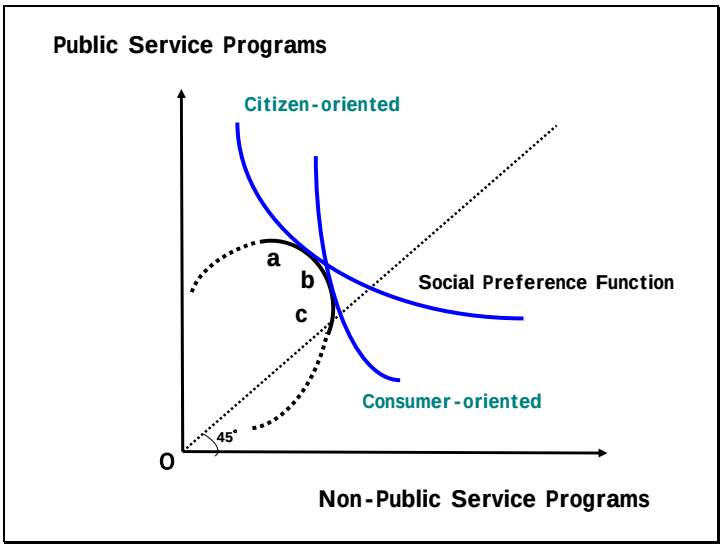


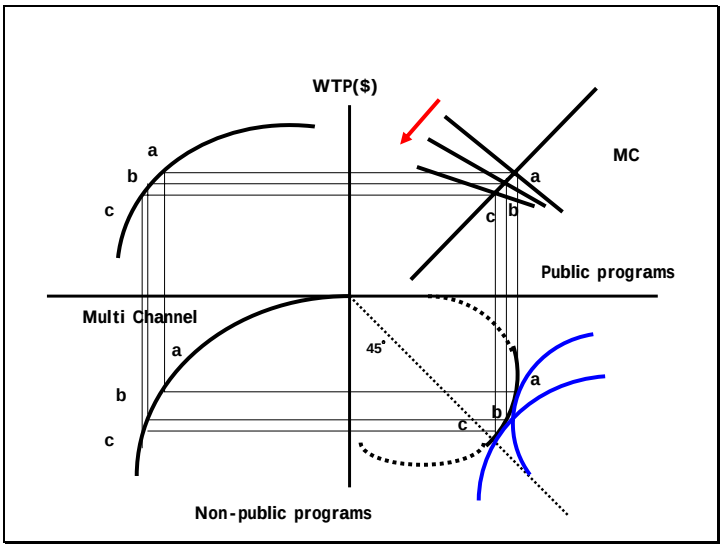
Figure 7 summarizes the overall effect of digital innovation on the broadcasting. The shift in the willingness-to-pay curves in the Quadrant I may affect a mix between public service programs and non-public service programs which is shown as a kind of production frontier in Quadrant IV. The convex curves indicate the social preference functions and the movement from point **a** to point **c** in Quadrant IV notes that social preference is changing toward more non-public service programs.

The concave curve in Quadrant II shows that due to multi-channels WTP per channel is decreasing with the increase in the number of channels. The convex curve in Quadrant III indicates the similar movement. In sum, the increasing availability of public service programs through commercial channels may lower WTP for the programs

[16] The possible shifts of the social preference functions in Figure 6 indicate that people tend to give higher values as consumers than as citizens. They also suggest that non-public service programs begin to embrace public-service type of programs such as History Channel or Discovery Channel.

PSBs offer.

Figure 7: The Overall Effect of Digital Innovation on Public Service Programs



It may be difficult to maintain their current status when market forces tend to force public broadcasters out onto the sidelines. When distinction between public service programs provided by commercial broadcasters and ones for public service broadcasters becomes unclear, in other words, it is also difficult to maintain a sizeable market share or economies of scale that is required for PBS to survive. Moreover, public service programs must be popular and keep higher viewer rates, which is also difficult to maintain due to rapid changes in preferences and taste as well as emerging new broadband platforms. The most critical question is how to compare the "quality" for commercial programs such as the History Channel, the Discovery Channel, or the Biography Channel with those provided by PBS. There also remains a question how the number of channels affects quality provision.[17]

To sum up, Figure 7 suggests that convergence as well as technological considerations will mean policies that will marshal wholesale changes in the broadcasting industry. This would mean a re-evaluation of what a "special market" might mean, although externality and "citizen" based concerns remain as the rationales for PBS.

[17] Armstrong and Wells(2005) discussed this issue in detail.

3 Redefining the Rationales of Public Service Broadcasting

3.1 Market Failures or Market Resilience?

Coase (1945) published a seminal paper on how the BBC became a monopoly. He showed that, in spite of what was seen as a scarcity of spectrum, that there was no necessity for the BBC to become a monopoly. The factors he identified include the negative impact the U.S. radio experience on the British government,[18] the lack of debate and the lack of willingness to ask for a debate on issues such as the BBC monopoly and advertising,[19] the government's concern about selection procedures,[20] and the lack of incentive the manufacturers and, especially, Marconi had to challenge the decision.

Coase's paper is important in a number of ways. For instance, it shows that the BBC was created somewhat by accident, to address an industry problem. At the time there was no conception of the need for a PSB. However, once the BBC was created, it might have seen value in the creation of a PSB charter as a way to foreclose questions about its monopoly position the way North American telephone company used the universal service obligation to foreclose competition. Coase's paper also helps understand the incongruity of NHK's funding mechanism and the problems it is creating in a world of technological change. It is interesting to observe how a business model that may have made sense in 1922 but that would not have survived very long in the

[18] The U.S. was going through a period of intense competition but also of huge interference problems that eventually force to government to regulate the sector.
[19] Coase shows that there was little debate of the issue. His analysis points to an outcome that came about "by omission" rather than in response to a well formulated strategy to create a monopoly. Coase's analysis points out that the decision of excluding advertising reflected a key official's personal prejudice. It also shows that the manufacturers were working on the basis of a different business model and did not have the interest in pursuing the issue. More than anything else, Coase's analysis entails some convergence of interest between the manufacturers and the government. While the solution might not have been what the industry might have settled on – at the time, the industry was converging toward a duopoly – the monopoly was not a solution the industry was adverse to. The major impact of the government does not seem as much the organization of a cartel-based monopoly as the stability the creation of the BBC gave to the cartel. Unfortunately that dimension is not discussed by Coase.
[20] Coase discusses the possibility of granting a monopoly license to a single firm. That strategy would have almost automatically meant that Marconi would be granted the license because it controlled the patent and it was the most powerful stakeholder. That option was not considered by the government. Coase discusses also the reluctance of the government to be faced by the need to have to select "efficiently" a small number of operators – how many was not clear – out of what it expected to be a large number of applicants.

private sector was “exported” overseas including to Japan and is still in place in the public sector.

The broadcasting sector is now receiving more attention from economists. Berry and Waldfogel (1997) have studied a number of issues that are specific to the U.S. environment but that have nevertheless relevance to policy considerations in other countries. Broadcasting is characterized by very large scale economies. They show that the scale economies that characterize the sector do result in economic inefficiency in the form of excessive entry in the commercial sector. Through a very detailed analysis of the programs offered by NPR’s radio stations and by commercial stations, focusing on the two genres where they compete the most directly, classical music and jazz, they show that public broadcasting does cannibalise some commercial broadcasting. At the same time, outside major urban centers, in areas that are not as well served, they find that public broadcasting does compensate somewhat for program under-provisioning. In other words, they show that in major urban centers, there would be more commercial provision of classical music and jazz were it not for the competition from public broadcasting. They also show that in smaller town and areas that are not as well served public broadcasting compensates somewhat for under-provisioning by the private sector. At the same extending they estimated their results using very detailed data on the radio sector and the extension of those results to the television sector is not straightforward in view of the extent of vertical integration in that sector.

Other questions economists concerned themselves with included whether commercial broadcasting meant excessive advertising or inadequate programming resources and the influence of the “two-sided” market structure of commercial broadcasting with the markets for viewers and advertisers on market performance. Many theoretical and empirical studies have been attempted to give us a better understanding of these questions.

European and Japanese public broadcasters have been major players where U.S. public broadcasters have been playing a minor role in program provision. In spite of differences in history, culture, and institutional traditions across nations, whether broadcasting market works efficiently or not remains a basic question. The issue is not only whether public broadcasters are given proper incentives to be efficient but also whether there are market failures and whether they are efficient at addressing those market failures?

The fundamental public broadcasting question raised in this paper is whether or not there are still “market failures” in a digital age. As in economic textbook, there are four major reasons for market failure: (1) monopoly and market power due to

government actions and/or economies of scale, (2) externalities, (3) public goods, and (4) severe informational asymmetries. [21]

In the analogue era, most saw the answer as simple and obvious: "Yes, there are market failures in broadcasting." First, limited spectrum meant few broadcasters, i.e., market power only "a visible hand" could mitigate. Second, broadcasting, in a one-sided market, was viewed as a merit good with positive externalities. Third, broadcasting is a public good for listeners and viewers such that its marginal cost is nearly zero and its output is neither rivalrous nor excludable. Fourth, public broadcasters are required to compensate for the general public's lack of knowledge about the quality of programs.

In most cases the following two institutional arrangements are used for correcting these market failures:

1) Like BBC and NHK, or PBS, institutional arrangements that establish public or semi-public independent broadcasters; and[22]
2) Regulations and rules such as "must-carry" and public broadcasting obligations in case of BBC are introduced.[23]

Although public service broadcasting is considered as a supplemental tool to improve program quality, digital technology is extremely powerful to change the environment surrounding a public service broadcaster. However, digital innovation and the rapid expansion of the Internet begin to make traditional economic rationales the half-life. [24]

Digital innovation has weakened if not eliminated most of the market-failure arguments.[25] Transparency is also increasing thanks to the widespread of the Internet, because it makes it easy for viewers or audiences to "voice". The problem is how to provide efficiently a good with a fixed cost but no rivalry and no excludability. There is

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[21] Dijk and Waagmeester (2005) discussed eight possible market failures such as (1) underprovision under ad-support, (2) excessive advertising, (3) inefficient exclusion under pay TV, (4) underprovision under pay TV, (5) excessive entry, (6) positive and negative consumption externalities, (7) consumption bias towards low quality, and (8) paternalism.

[22] The historical and political background varies from country to country. They are considered a necessary step to provide public service programs for educating the public and keeping cultural identity.

[23] "must-carry" rules may also apply to commercial broadcasters.

[24] Foldvary and Klien(2003) suggested that technological advancement imposes on specific policies and their justifications and pointed out that " the faster that technology advances, the shorter the intellectual half-life of government policies will be."

[25] See Delong and Froomkin (1999). They pointed out that the assumptions of market system are changed drastically as a result of evolutional advances in data processing and data communications.

a market failure, hence there is a need to find an efficient solution that may or may not involve private markets. Table 2 is the summary of the major changes in a public service broadcaster under digital pressure.

Table 2: Market Failures in Digital Era

Market Failures		Analogue Era	Digital Era
Monopoly Power		Oligopoly	Contestable market
Public Goods	Non Rivalry	Yes	Increasing rivalry
	Non Excludability	Yes	Increasing excludability
Externalities		Merit goods & social minimum	Increasing substitutability
Asymmetric Information		Yes	Increasing transparent

Source: See Delong and Froomkin (1999). They discuss the effect of digital media on rivalry, excludability, and transparency.

There is a question whether PBS-type programs supplied by public service broadcasters and commercial broadcasters are identical or not. Berry and Waldfogel (1997) found evidence of substitutability between them in the case of public radio in the United States. It is extremely difficult to prove the differences in quality and moreover, as discussed by Bennett (2005), there is a possibility that new communication technologies "interact with corporate profit motives to create generic, "lowest-common-denominator" information formats". Particularly in case of news programs which we expect high quality, he indicates that "there are four characteristics of news that stands out as reasons why public information in the United States does not always advance the cause of democracy: *personalization, dramatization, fragmentation, and the authority-disorder bias*".[26]

Schewer and Daneshvary (1995) also suggest that the Public Service Broadcasting (PBS) in the United States faces increased competition from cable television. Their studies on willingness to pay of PBS indicate that "a viewer's preference for cable television, perhaps reflecting the preference for specific look-alike channels or greater variety, reduces the amount a person is willing to pay to contribute

[26] See Benett (2005), pp.36-73. He pointed out that "public broadcasting in the United States is not as independent as it could be because it is forced by limited government support to take money from commercial sponsors".

to PBS".[27]

There is a need to constantly question existing business models and existing industrial organizations. Thus, while Coase (1974) showed that in England until the middle of the XIXth century, the private sector played a significant role in the provision of lighthouse, the model eventually lost its viability.[28] Late in the XXth century that model, in turn, failed and we moved back to model that is closer to the model that was in place in England in the early years of the lighthouse, a model in which the private sector plays a greater role. As ships now are navigated by GPS and lighthouses become "historic monuments and scenic amenities", it is reasonable to consider whether it is more efficient for PSB services to be increasingly provided by the private sector.

3.2 Policy Options for Future of Public Service Broadcasting

3.2.1 Voluntary Payment System as an Ideal Funding

Public service broadcasting under the digital innovation stands at the cross roads. Under pressure of digital innovation and the rapid expansion of the Internet-based networks, the traditional concept of "public service broadcasting" has largely lost its relevance. It becomes imperative to re-evaluate the basic concept in response to the new market and technological realities. Regardless of such a debate, new platforms are emerging that are operating outside the traditional broadcasting sector. It is this trend together with the growing interest of the private sector in providing services, as illustrated by C-SPANN, that had historically been exclusively provided by public broadcasters.

Some insist that public service broadcasting should be sustained as a part of cultural policy and developed as complementary to what market mechanism can provide. While the market is not the panacea to all economic problems, established firms do not have the flexibility to respond to the new realities and to appreciate the emergence of the new paradigm because it challenges existing models. Christensen (1993) has shown that this was what happened to the disk drive industry. It is even more relevant in a sector that had had little incentives to initiate innovations for its very survival and that has to confront competitors on technological grounds it is not familiar with. As a recent article in Fortune Magazine shows it, economies of scale and being number one is not the road to success: "agile is best; being big can bite you" and "find a niche; create something new". The new channels such as C-SPAN[29] and the History Channel are

[27] Schewer and Daneshvary (1995), p107.
[28] See Beltran et al. (2005) and Fovdary (2003).
[29] C-SPAN, an American cable television network, is specialized in covering government proceedings and public affairs programs.

demonstrating that public service programming is not a natural monopoly that has to be supported by the government but, instead, that the market is willing and able to invest in high quality PSB-types of programs thanks to the new, technological environment.

As noted earlier, the funding mechanism plays a crucial role in PSB. Today's funding mechanism can be traced back to a mechanism that had been developed by Marconi in 1922 in England and that has not been subject to a careful review since then. There is nothing to suggest that it is efficient.

The funding mechanism imposes the same charge on all regardless of income. This means that it has the form of a regressive tax on low-income users. This has led Lipsey (2004) to argue, in reference to the BBC, that since nearly almost all households have a television and "nearly everyone is obliged to pay it" the funding mechanism can be "a particularly vicious, unfair, regressive and onerous tax".[30] However, Lipsey's argument is flawed. First of all, Lipsey does not address the problem he sets up, namely the efficient provision of a public good, i.e., the efficient provision of a good where there is a market failure. He only points out that the present solution is suboptimal compared to an environment without market failure rather than assessing there exist a more efficient solution under those conditions. Mueller and Schement (1996) studied why people might not have telephone service based on a study of Camden, N.J., a town that is exceptionally poor and depressed. They conclude that households tend to prefer television and, especially cable television, over telephone services. "Their reasons are not irrational: a) telephones often expose them to charges they perceive as uncontrollable; b) telephones can be a channel for undesirable interaction involving drugs and crime; and c) government agencies and businesses, which these household view as threatening, may call them for matters like bill collection.[31]

Two very different systems have a funding mechanism that is subject to the free-rider problem. Hobbs (1651) made his name arguing that humans will be opportunistic, i.e., that they will take advantage of any opportunity to free-ride. Most modern economic analyses rely also on the hypothesis that individuals will act exclusively on the basis of their self-interest. Hardin (1968) wrote one of the most quoted papers of the XXth century on the free-riding problem, "The tragedy of the

[30] See Lipsey (2004) pp.34.

[31] These households believe, a) cable TV offers inexpensive entertainment; b) the many hours and large variety of entertainment provides more satisfaction to more members of the household than telephone conversations; c) cable may keep children at home and away from dangerous streets; and d) cable offers a visible sign of well-being in households with few material comforts."[31] This suggests that those households have a high willingness to pay for television services and that a fixed household charge is not likely to be regressive.

commons". Yet, those models are inconsistent with a large literature on experimental economics as well as literatures in fields such as sociology and psychology as well as common observations that demonstrate that individuals, as a whole, do not act exclusively on the basis of their own self-interest. Altruism is pervasive in human society in such a way that it normally compensate for free riding. Empirically, we observe that most peer-to-peer networks are functional in spite of the opportunities members have to free ride, as discussed by Strahilevitz (2003) and Bourdeau de Fontenay et al. (2005). Both NHK and the American's PBS and NPR have relied on a funding mechanism that is very vulnerable to free riding and yet both funding mechanisms, even if they are very different, have functioned effectively. A careful study of markets shows that most markets are characterized by some level of free riding and that this is a necessity to ensure their proper functioning. Hardin (1998) recanted the position he had taken in 1968, acknowledging that free riding does not generally undermine the functioning of systems. Kropf and Knack (2003) have studied the issue in the context of PBS in the US to conclude that, in spite of extensive free riding, under-provision is not a major problem.

There is now a funding problem with NHK. The problem is one of free riding since 30% of the people do not pay their fee anymore. The problem is one of free riding only to the extent that the stability of a system that accepts free riding requires a governance that ensures a credible punishment where the equilibrium is challenged. In the case of the NHK funding, it is the embezzlement and cost allocation that have undermined the funding mechanism rather than free riding. Those problems would have resulted in the breakdown of most governance, independently of free riding and in all cases as in the present situation it is the governance problem rather than free riding that has to be addressed.

3.2.3 Policy Options to Public Service Broadcasting

One of the basic economic problems concerning a public service broadcasting system is that when the privilege is only assigned to a monolithic organization, there is no incentive to efficiency, which may directly deteriorate consumer surplus. It is essential to set up an incentives mechanism to be efficient. It is a common recognition that competition is a major driving force to enhance efficiency.

The broadcasting market is composed of three levels of layer such as (1) content production layer, (2) platform layer and (3) network layer. In contrast of telecommunication regulation, since the aim of competition policy in the broadcasting industry is to increase public service programs, it would be important to promote supply

of public service programs in the content layer. As Peacock (1996, 2004) proposed, contestable funding[32] is a way to pursue both efficiency and provision of program. He pointed out that pointed out that "there is no competitive tendering for funding of PSB programmes and the BBC is given an unfair advantage".[33] The most important mechanism of is "to rely on the conditions attached to the award of franchises as a method for inducing commercial companies to comply with public service requirements".

New Zealand established public service broadcasting funding system called "New Zealand On Air" (NZOA), under which any broadcaster or independent producer could bid for funding for public service purposes.[34] Mayhew and Bradley-Jones (2005) analysed NZOA and concluded that "as a contractual arrangement, the contestable funding model considerable more transparent, ensuring that the recipients of funding are explicitly accountable", although they found the limitations of public service broadcasting fund in the difficulty of setting quality criterion and priority, thinning out of applicants for funding, and narrowing in the types of program.

There is growing evidence that technological changes are increasingly eliminating potential sources of market failures. The growing potential of efficient competition is bound to enhance organizational efficiency and quality in terms of uniqueness and innovativeness. Striving for greater efficiency that way should become a priority given that a growing proportion of the population does not see the public service broadcasting "as a focal point in their lives". This is particularly true for the younger generation who are aware of the new technological options, and know how to use them to access information through the Internet using various wired and wireless instruments. As Peacock (2000) points out, competition "would also be a protection against the public service broadcasting becoming a cultural ghetto - the inevitable result of being the major arbiter as to whose plays, music and art shall be presented to the public, through no one can deny that is still provides us with some wonderful cultural programmes".[35]

PBS in the United States does not have access to the kind of public funding PSBs are familiar with in Europe and Japan. As a result, it has had to be more innovative. One of those PBS new ventures may is pioneering new ways to use resources more efficiently while making funding more secure. PBS's for-profit

[32] The original proposal was found in the famous Peacock Report in 1986.
[33] Peacock (1996), p.9.
[34] It is often pointed out that New Zealand's attempt to run "an arts council of the air" is not entirely successful.
[35] Peacock (2000),p.20.

subsidiary is leasing its nationwide networks to a private company called MovieBeam that provides on-demand movie services. The separation of owning network from producing public service programs seems to be the first step to build "a digital commons"[36] that is open for any entrants that replaces today's single monolithic organization and enhances the supply of public service broadcasting.

Another way to foster efficiency and encourage innovation would be to allow the public service broadcasting to engage in online broadcasting. In the US, a public radio station affiliated with NPR that is specialized in jazz, WBGO, has now been broadcasting its programs on the web for many years. This has enabled the station to gain expertise in new technologies while extending its reach and expending the population of listeners who are willing to contribute to its funding. Like BBC, Japanese public broadcaster, NHK, is permitted to budget $10 million for online broadcasting. Since NHK holds about 550 thousand programs as archives, it will provide NHK with the competitive edge in the broadcasting markets. However, if NHK is allowed to be involved in market transactions by selling the archives as well as engaging in online broadcasting, the rationales for confining funds which are collected as mandatory fees to one organization should be in a dispute.

In sum, as Dearkin and others (1999) and Murdock (2004) pointed out, unbundling of program production and the use of transmission network including use of the broadcast spectrum is essential, "to provide the basis for new shared cultural space, a digital commons, that can help forge new communal connections".[37]

Concluding Remarks

The environment that surrounds the traditional broadcasting market is changing at a rapid pace. The Internet is reshaping both the supply demand side of the broadcasting industry. On the supply side, the market boundary is blurring since the Internet makes it possible for people to access more and more innovative goods and services. On the demand side, the Internet is providing a natural platform that is encouraging direct and more informal interactions between producers and consumers as well as among consumers. The Internet has made it possible for consumers to be better informed about goods and services. More significantly, it is giving them the option to

[36] Mudorck (2004). While public broadcasters played a pivotal role of building a terrestrial television network as a commons, the increasing number of substitutable digital networks such as satellite, cable, computer-networks using the Internet has been created so that the use of a digital commons is not necessarily limited to a single monolithic public broadcaster. The proposal of a Public Service Publisher in UK reflects the recognition that the current model would not survive in a digital era.

[37] Dearkin et all (1999), pp.22-23 and Murdock (2004), p.1.

have control such as in peer-to-peer networking.[38] In addition, the younger generation thinks increasingly in terms of mental models that are medium-independent, i.e., in which broadcasting is only differentiated from a movie or streaming in terms of achieving the desired experience.

As Chan-Olmsted and Ha (2003) points out, "television broadcaster's Internet competencies are a result of the interaction between both the firm/internal and market/external forces", and it may "give strategic options either revenue, cost, or support-focused".[39] The evolution of iPoding, blogging and social networks, or search engines such as Google and Yahoo using the Internet allows Internet Service Providers to enter into the broadcasting business just like WBGO[40] is learning to become an Internet service.

No human institution is perfect in all its dimensions. One dimension's success is closely linked with another dimension's failure. The traditional concept of public service broadcasting does not have the required flexibility that is required to succeed in the Internet world. In a world characterized by innovation market competition is the best way we know to achieve efficiency.

Van Zandt (1993) pointed out that "the stark dichotomy between "private" provision and "government" provision of goods and services that stalks many general discussions of public policy is, at best, a useless abstraction and, at worst, a barrier to understanding how goods and services are provided in the real world",[41] which covers great variety of institutional structures to provide goods and services. The technology helps to determine the institutional form of the service.

It is difficult to project what benefits we will derive from digital innovations when the broadcasting and telecommunications sectors are converging. Risk is denoted in Japanese Kanji as a combination of risk and opportunity. Today's risk may represent tomorrow's opportunity. There is a great need to use the market mechanism, particularly competitive force to let new comers try out new things.

While public service broadcasting holds only a small portion of the broadcasting market, particularly in the United States, it has a strong influence as media in most nations. Public service programs are considered to be merit goods similar to education and health programs in those paternalistic states such as Japan and the United Kingdoms. However, digital innovation makes it easier for consumers to access

[38] Ofcom (2006), p.19. It reports that only little more than 20% of 16-24 year olds watch television, compared with about 50% of 45 year olds and more.
[39] Chan-Olmsted and Ha(2003), p.559-600.
[40] WBGO is a public web radio station in Newark, NJ that plays jazz music.
[41] Zandt(1993),p.71.

comparable, if not identical, programs in terms of diversity and quality. Although the question remains as to how the market-supplied programs could establish trust or reputation, if public service broadcasting is defined as, to paraphrase Lincoln, "of the viewer, by the viewer, for the viewer", we must acknowledge the direction the viewer views.

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