

Cable Telephony in the United Kingdom (1)

—The Emergence and Growth—

Takeshi Oshima

Abstract

The objective of this report is to analyze the cable telephony business in the United Kingdom focusing on its emergence and growth from late 1980s to early 1990s. Cable telephony, a provision of voice telephony service by cable TV companies, has become possible because of a series of UK government liberalization policies, and has had a significant impact, in the context of relaxation of regulation on the information and telecommunications industries. On the one hand, cable telephony added great value to cable TV business. Operators could expect a dual revenue stream with less incremental cost, utilizing the existing cable TV infrastructure. This new service proposition, together with other favorable regulatory changes, attracted new investors principally from North America, and accelerated both cable TV construction and connection. On the other hand, it created a new competition in the UK telecommunications industry, particularly in the residential market where no competition existed before. First, in this report, the background of both industries will be outlined individually. Then, the new business, cable telephony, will be examined in terms of history, market, technology and other features.

1. Historic Overview of the UK Telecommunications Industry

The UK telecommunications industry could be divided into three stages in terms of its deregulation process; (I) the era of monopoly, (II) the process of liberalization with privatization of BT, and (III) the stage of

further deregulation with Duopoly Review.

1-1. The Monopoly Provision (Phase I)

From 1912 to 1981, provision of telecommunications service and equipment in the UK was a state-owned monopoly under the responsibility of the Post Office. Because of (i) the requirement of enormous capital investment, (ii) the necessity of technological standardization, (iii) the mission to impartially provide service to nation-wide public, and (iv) the concern of national security, the monopoly provision was a reasonable and practical choice in common with all other developed countries.

However, as time goes by and people saw productivity improvement in other private sectors, all the inefficiency due to being a state monopoly gradually started to draw public and therefore government attention. In 1979 the new Thatcher government started the process of liberalization of the UK telecommunications industry based on the belief that *since competition is the best way to keep prices low and quality high, the state's job is to make competition real*⁽¹⁾

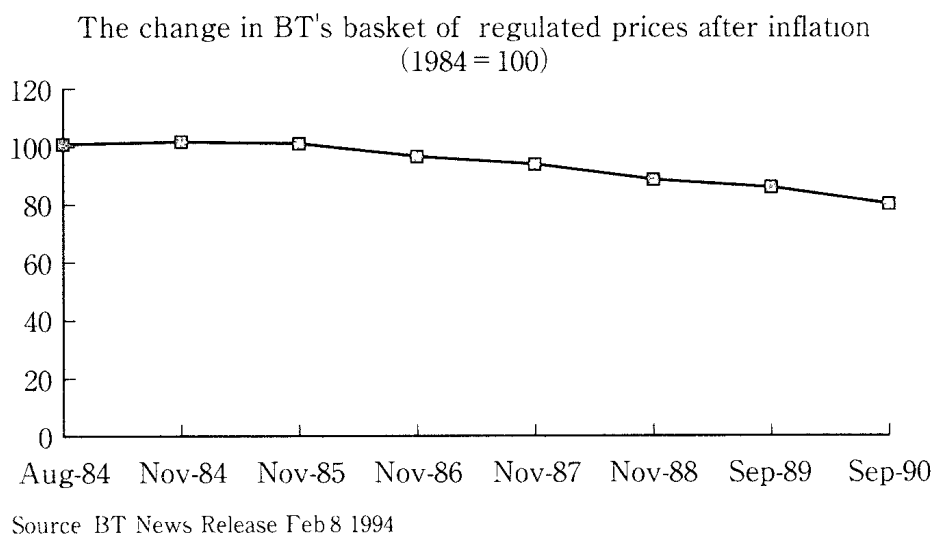
1-2. The Process of Liberalization (Phase II)

The British Telecommunications Act 1981 separated the telecom's function from the Post Office and established a new public corporation, i. e. British Telecommunications. BT was privatized in three stages beginning in 1984, with the government finally selling off its residual shareholding in 1993. It was given a universal service license which obligated it to provide the same level of service and prices throughout the country.

Competition was considered to be an essential ingredient in the process of telecoms reform. The government wanted competitor to function as a yardstick against which to assess BT's performance. Consequently, Mercury Communications, a Cable & Wireless⁽²⁾ subsidiary, was licensed in 1984 to offer a service in competition to BT.

The process of UK telecommunications liberalization was completed in 1984 with Telecommunications Act regulating all the frameworks of the new competitive environment. In accordance with the 1984 Act, the Office of Telecommunications (OfTel) was created to regulate the industry. The

Figure 1. BT Real Telephony Prices



key objectives of Oftel were

- (I) to administer price regulation,
- (II) to encourage the transition to a fully competitive industry.

The new business environment brought about significant improvement in BT's productivity and service quality. The waiting time for telephone line installation reduced from 3 months (1980) to zero (1988)⁽³⁾. Under the price cap regime, the real telephony price decreased by 20% by 1990 as shown in Figure 1.

However, in terms of competition, the effect of deregulation was not maximized. Mercury has concentrated on serving commercial centers and has competed in the provision of long distance and international calls. The company effectively increased its share in that market⁽⁴⁾, but not in the residential market. It was reasonable for Mercury as a private company to concentrate on segment where it can expect more revenue with smaller investment. Duplicating nation-wide local infrastructure to serve residential customers was far beyond the scope of Mercury. Residential customers had virtually no choice other than BT in that there was no alternative local loop provider. As a result, BT's strategic priority naturally went for business segment or heavy users to react Mercury's erosion, leaving the residential market a niche segment.

The competition in this period was a managed race since the govern-

ment clarified the policy to sustain until at least 1990 a national PTO (Public Telecommunications Operators) ownership duopoly. The reason for this duopoly policy was to provide a stable business environment for both BT and Mercury to operate and grow as private companies and thereby provide stability for their shareholders and for the UK economy overall⁽⁵⁾.

1-3. The Duopoly Review (Phase III)

Although duopoly policy had a rationale described above, the government itself was not satisfied with the condition of competition when it reviewed the policy following the provision of Telecommunications Act 1984. The government viewed *the distortion which needs corrective action was the overwhelming dominance of BT*.⁽⁶⁾

The government white paper 'Competition and Choice: Telecommunications Policy for the 1990's' declared the end of managed competition under the name of duopoly policy. The phase of more open competition had started.

The most important feature of the new regulation was the change in licensing policy. Under the new regime, general conditions for entry were set and anyone could enter the market on those terms. Competition had then become investment-led, with those financing the operators deciding when the time was right to promote their market entry.

The white paper also lifted up the regulations requiring cable TV operators to offer telephony only in conjunction with BT or Mercury. This enabled cable operators to provide telephony with their own switches, and thereby became a driving force for the cable telephony's development.

2. Analysis of the UK Cable Industry —The History—

The process of cable business development in the UK could be divided into three stages; i.e. the narrowband era before 1980, the introduction and slow growth of broadband cable in the 1980 s, and rapid expansion of both connections and constructions in the early 1990 s.

2-1. The Era of Narrowband System (Phase I—before 1980)

Cable business started in the 1950 s in the UK. The first UK city-wide cable network opened in 1951. Cable TV, which is also called Community Access Television (CATV), was initially designed for the purpose of distributing television in areas with poor UHF transmitter reception (i.e. in hilly terrain). These systems were run over a pair of twisted copper wires and were only able to carry about four television channels (so called narrowband system). As a substitute of terrestrial broadcasting, the low capacity limitation and the initial mission as a substitute, the cable business was not so attractive to draw public and investors' attention.

2-2. Slow Growth of Broadband Cable (Phase II—1980s)

The development in the UK of a cable network virtually began in early 1980 s when the government perceived the need to develop a broadband cable network. The new broadband systems had a much greater channel capacity, generally in the range of 30-40 channels with the technology of coaxial cable, or more recently a mix of fiber-optic and coaxial cable. The process of developing broadband cable network was boosted by a report from a group of advisors appointed by Margaret Thatcher called the information Technology Advisory Panel. They saw immense benefits flowing from the encouragement of modern broadband cable systems.

In 1983 the conservative government's White Paper 'Development of Cable Systems and Services' outlined a long term plan for UK cable, which led to the award of 11 pilot licenses. The subsequent Cable and Broadcasting Act 1984 created the legal framework for cable industry. The government established the Cable Authority⁽⁷⁾, an organization empowered to grant franchises and to regulate the development of the industry.

In spite of government enthusiasm, the UK broadband cable network did not develop so rapidly. There were still some regulatory restrictions which seriously hindered the construction of broadband cable infrastructure. For instance, the government banned the non-EC ownership of UK cable franchises. This, along with the abolition of capital allowance,

deterred most US regional telecommunications companies (RBOCs) and CATV companies to be involved in the business. Also, it should be noted that entry barrier into the telephony business until 1990 maintained the CATV business unattractive.

2-3. Rapid Growth with Further Deregulation (Phase III—early 1990s)

Two of the main problems described above were addressed in early 1990 s. First of all, the Broadcasting Act 1990, which replaced the provisions of the Cable and Broadcasting Act 1984, abolished the prohibition of foreign (non-EC) ownership of cable franchises. Secondly, cable telephony became practical resulting from the government review of the UK telecommunications duopoly. The so-called Duopoly Review opened competition in voice telephony and allowed operators act as principals.

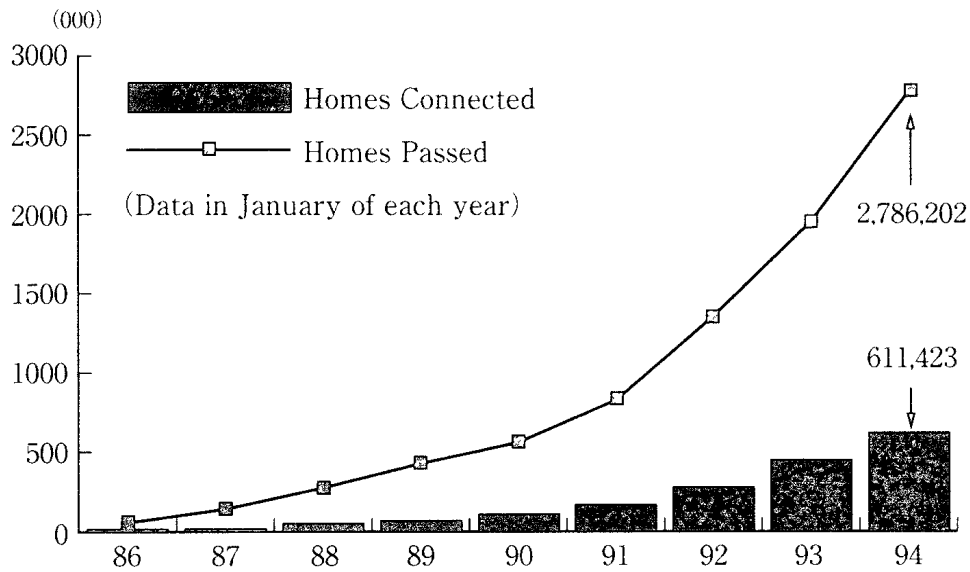
Furthermore, it prohibited BT from providing entertainment service on their networks until 2001 (with the review of 1998) . This, kind of unfair regulation (as some argue) , was aiming at promoting the business of weak cable operators by allowing them to enter a new market while protecting their existing business from the invasion of strong BT. The policy successfully made cable business more exclusive and thereby attractive.

More essentially, the poor quality and quantity of programs were gradually improved in the early 1990 s. The rapid increase in satellite channels after the launch of BskyB and Sky Television in the late 1980 s, made it possible for cable operators to offer various ranges of high-profile programs. For example, United Artists Communications Plc. started to provide over 35 channels to choose from, and over 300 films a month, which seems more than satisfactory for average viewers at least in terms of quantity.

These environmental changes were favorable enough to attract both investors and customers. As a result, the UK cable industry showed an impressive growth in the early 1990 s.

In Figure 2, increase in the number of home passed (hence, released for marketing) indicates the high pace of constructing infrastructure. The

Figure 2. The Growth of Cable



Source: The Cable TV Association

growth coincides with the increasing number of operating franchises from 29 to 65. The number of homes connected reflects the public popularity towards cable TV by showing simply the accumulated subscription number minus accumulated number of churn.

3. Analysis of the UK Cable Industry —The Market and Operators—

The status of the UK cable market as of 1 January 1994 is shown in Table 1. The meaning of each variables will be examined as follows.

3-1. Awarded and Operating Franchises

The awarded franchise areas covered approximately 14.9 million

Table 1. Market Status of UK Cable (1st January 1994)

Number of Franchises Awarded	127
Number of Franchises Operating	65
Broadband Homes Franchised	14,964,500
Broadband Homes Passed	2,786,202
Broadband Homes Connected	611,423
Average Penetration % (1)	21.9%
(Average Rate of Churn %) (2)	(30~36%)

which account for some 70% of all UK homes. Considering the market opportunity, the total number of awarded franchises was not likely to expand greatly.

It should be noted that geographic distribution of business varied; i.e. Greater London accounts for 31% of subscribers in the whole UK market, retaining only 18.7% of franchised home whereas some rural areas were far behind.

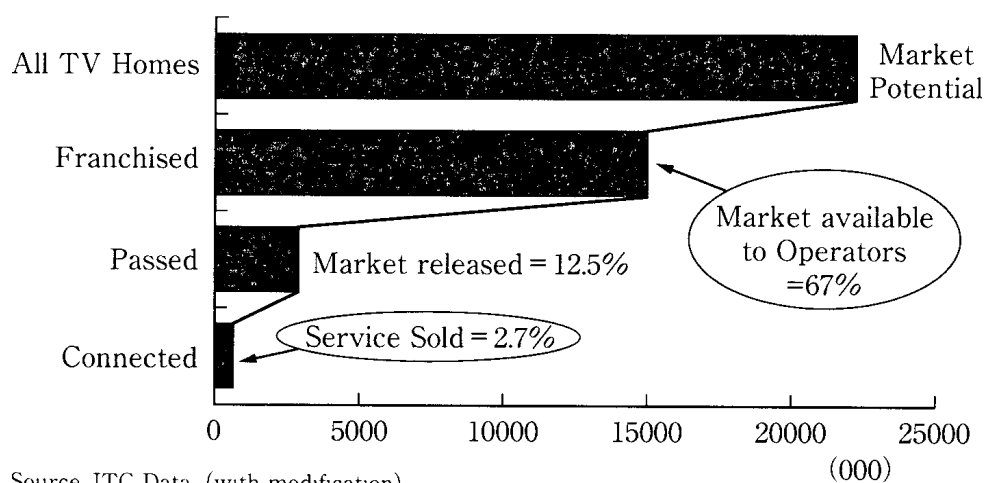
3-2. The Degree of Construction-Home Passed

The number of home passed, 2,786,202 represents only 18.6% of all franchised home. When we consider the total number of TV homes which is estimated 22.225 million, broadband cable was available 12.5% of all TV homes and only 2.7% of them were enjoying the service. (This 2.7% -connections/all TV homes, should be distinguished from the more common used penetration 21.9% -connection/home passed.)

Level of development of cable franchises varies considerably. Key factors of the variety were, strategy and finance of operators, geographic market potential of the franchises, and individual timetable required and audited by Oftel. However, in general, many franchises still required significant infrastructure development, and only a few (5 out of 127) franchises almost completed their builds at that time.

Figure 3 illustrates how large the total market potential for cable business was, compared to the actual number of homes passed and

Figure 3. Cable Market Opportunity in 1994



connected. As a matter of fact, the number of homes franchised was not likely to expand so greatly because some areas with low density were not suitable for the business. It could be concluded that UK cable business in the early 1990 s was still in its early stage and the market had still room to grow further.

3-3. Penetration—The Number of Homes connected

Penetration, one of the key measurement of success, is given by [the number of homes connected/the number of homes passed]. Hence it illustrates how many people chose the service and are paying for it, given the service is available. 1993 was the first year when cable TV business met a decline in sales penetration. The year recorded -0.4% growth on average base after the stable growth of around 2.3% for 3 years.

Statistically, up to 35% of homes are expected to sign up for cable TV when a cable company markets a service in a new area. This is principally due to the aggressive approach of operators with heavy advertisement and sales promotion after the launch. Historically, overall penetration has shown stable growth because of this new launch effect. Therefore, 1993' s poor performance despite of the same scale of new launches could be mostly explained by the effect of churn, given that operators did not change their sales strategy⁽⁸⁾.

3-4. Churn Rate

According to the Cable TV Association, rate of churn, the proportion of subscribers who disconnect from cable, is in the range of 30% to 36% p. a. However, this rate differs significantly depending on operators approaches in their initial sales. Some operators believed it important to attract large number of households to try cable TV. Free trials, discount offers and short-term contracts were all designed to achieve high initial sales and they expected higher level of churn. Other believed it to be more important to attract long-term subscribers in smaller numbers. Obviously, the former approach required more technique of subscriber management to minimize churn. 1993 poor penetration is due to higher churn rate resulting from previous years' aggressive sales.

Table 2. UK Cable Owners (1st, January 1994)

Rank	MSO (Groups of Investors)	Equity Adjusted Homes	Total Homes in Area	Number of Franchises
1	Tele West (TCI/VS West)	2,525,480	3,266,000	24
2	Nynex	2,497,700	2,497,000	18
3	International Cabletel	1,202,250	2,431,000	15
4	Southwestern Bell/Cox	1,056,000	1,056,000	7
5	BCETI (Bell Canada/Mercury)	955,031	1,822,844	17
6	Groupe Videotron	717,339	1,045,844	10
7	General Cable 648,373	1,546,000	10	
8	Telecential (CUC/Telus)	611,833	742,000	9
9	Diamond Cable	554,000	554,000	7
10	Singapore Telecom	527,695	1,130,888	8
≈		≈		
19	British Telecom	120,000	120,000	1
≈		≈		

Source : Financial Times-New Media Market, February 10, 1994

3-5. Profile of Key Operators

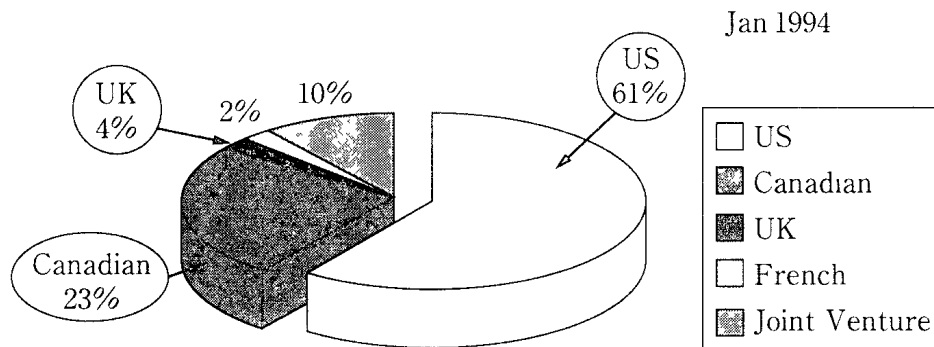
After the Duopoly Review and liberalization of foreign ownership in the early 1990s there has been a significant increase in foreign investment in the UK cable market, principally from North American telecommunications and cable TV companies. These North American investors generally have interests in a number of franchises and, hence, are often called Multiple System Operators (MSOs).

Table 2 gives some ideas about the distribution of UK cable ownership showing the 10 largest owners and the status of British Telecom.

The largest UK cable operator was TeleWest, a 50/50 joint venture between Tele-Communications Inc. (TCI, the world largest cable TV company) and US West, one of US RBOCs. TeleWest had interests in 24 franchises and coverage including 2,525,480 equity adjusted homes⁽⁹⁾.

Four cable ventures had more than one million equity adjusted homes. These operators were TeleWest, Nynex, International Cabletel and Southwestern Bell/Cox. All of them were, or included US RBOCs and

Figure 4. Nationality of Cable Operators



National Distribution of 127 UK Cable Franchises' Ownership

Source Cable TV Association

seemed still in the process of their consolidation.

In Table 2, we see some difference of investment policy among MSOs. Some investors such as Nynex pursued full control of business. (Equity adjusted homes corresponds with total homes in franchises/the shaded companies.) whereas some like TeleWest and International Cabletel expanded their franchises at the expense of 100% ownership.

Figure 4 indicates national distribution of UK cable ownership.

Obviously, North American companies were dominant in the UK cable industry, occupying 84% of franchise ownership. US companies were also involved in 7 joint ventures (3 with Singapore and 4 with UK). There are some factors to account for this distribution.

First, the US cable TV companies had accumulated experience and hence know-how of cable business. This is due that the US is the most developed country in terms of commercial base cable TV.

Second, the North American RBOCs, as well as cable TV companies, had strong incentives to be in. While telecommunications business in the US and Canada gives them large and stable cash flow, the matured market does not have a great potential to grow further. It was, therefore, a good business portfolio for RBOCs to invest in a Question mark⁽¹⁰⁾ (= UK cable), supporting themselves with a Cash Cow (revenue from regional telecoms business).

Third, in the US and Canada it was prohibited for a company to do both cable and telecommunications business in the same area. However, with

much prospect to deregulation, RBOCs needed to gain experience of providing entertainment services while cable companies needed experience of providing and billing switched, two-way services.

As above, these factors attracted North American investments, and thus the UK cable market were dominated by foreign capitals.

4. The Profile of UK Cable Telephony

As mentioned individually in the previous sections, cable telephony emerged as large driving force for involvement in the cable side, where telecommunications companies took it as a threat. Here, the new business will be analyzed in various prospects.

4-1. Overview of Development

The operators of broadband cable franchises were permitted to provide both cable television and telecom service under the provision of Telecommunications Act 1984. The first pilot scheme for cable telephony was undertaken in 1987. However, cable telephony did not grow in the 1980 s. The accumulated connections in 1990 were less than 2,000.

This was due to the incomplete change of law. Before the Duopoly Review only BT and Mercury were allowed to provide telecommunications service as principals and cable operators were required to act as an agent in conjunction with them.

Neither BT nor Mercury wanted any radical change to the duopoly. But Mercury, on the contrary to BT, positively offered interconnect terms to cable operators to fill their disadvantage of lacking local loop access to customers. It sought to convert the cable operators into agents for its own telephone service. It would do the switching, provide the numbers, do the billing, and generally control the customers while cable operators were offered small margin for providing the physical access. However, these terms were not attractive to the cable operators who wanted to build and run their own telephony business. Under these circumstances MSOs were deterred to be involved.

The business environment dramatically changed when the government reviewed the UK telecommunications duopoly policy. The key features of

Table 3. Summary of Duopoly Review

<p>«OLD» Telecommunications Act 1984</p>	<p>«NEW» Telecommunications Policy in 1990s (Government White Paper 1991)</p>
<p>-In certain main business districts (City of London, Westminster, Camden, Manchester and Birmingham) business data services were to be provided by agreement with either Mercury or BT.</p> <p>- Cable operators might provide voice telephony only as agents for Mercury or BT. The licence condition required operators to lodge a copy of their Mercury or BT agreement with OFTEL and obtain a determination from the Director General to be able to provide voice telephony services in a specified part of the franchise area.</p>	<p>-The requirement on the cable operator to provide voice telephony only in conjunction with BCE or Mercury was lifted. MSOs were allowed to switch their own traffic, and to seek an interconnection with any national PTOs. An OFOEL determination will no longer be required.</p> <p>-Cable operators may interconnect adjoining franchises even if they are under different ownership.</p> <p>-BT (and other national PTOs) are blocked from entering the entertainment services market for ten years though this position could be reviewed after seven years.</p>

Source : Cable TV Association

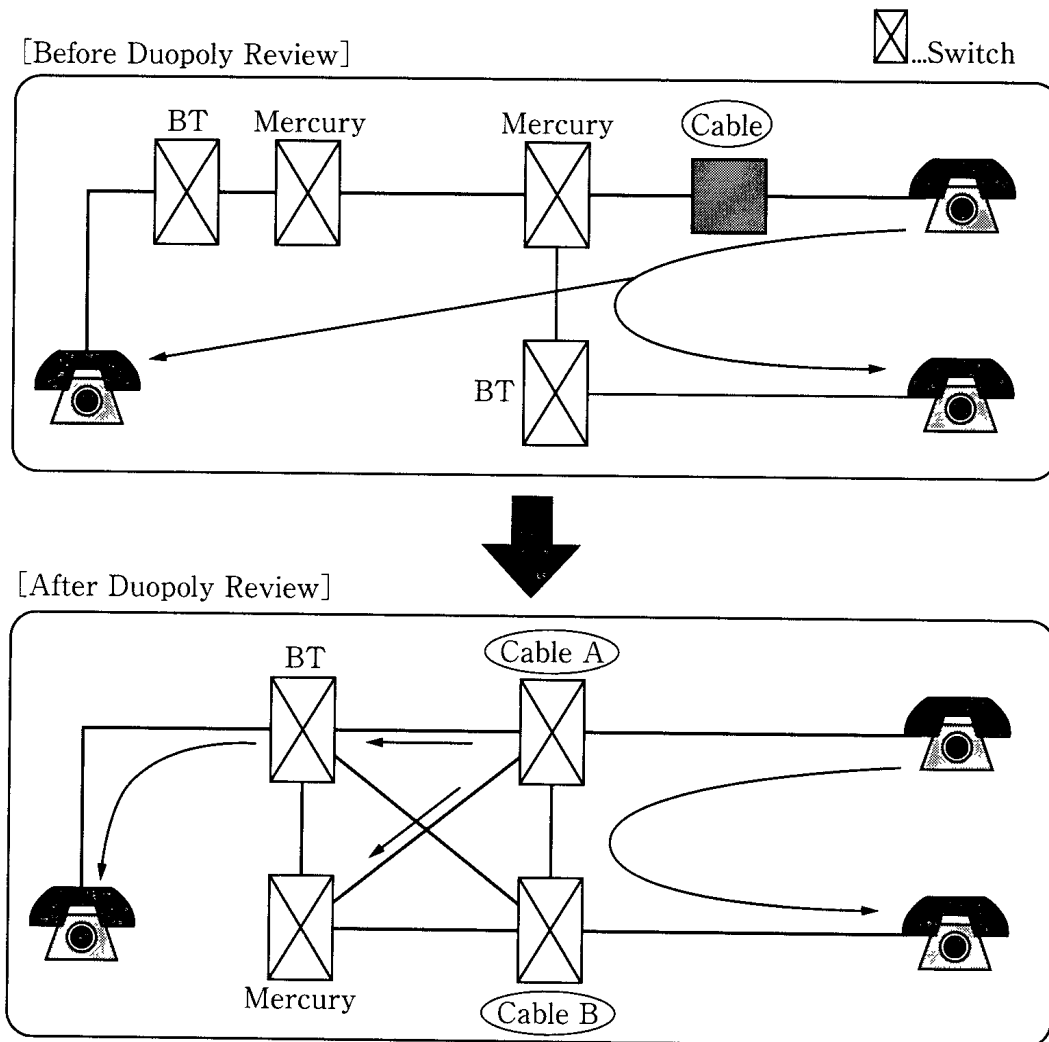
this Duopoly Review are summarized in Table 3.

Duopoly Review enabled MSOs to do their own switching, to route calls in the most efficient manner at all times, minimizing consumer charges and maximizing operating margins. It is estimated that self-switching can increase the gross margin available to operators by as much as 25%. The changed routing is illustrated in Figure 5.

The main drawback of self-switching is that it requires high initial investment. However, this problem was mostly settled by the increasing interest of wealthy North American RBOCs and cable companies when prohibition on foreign franchise ownership abolished in 1991.

In 1992, following Duopoly Review, and taking note of less than harmonious relationship between Mercury and cable operators, BT began negotiations to provide interconnect service. BT reasoned that *if it was mandated to lose market share, or merely if the government expected that*

Figure 5. The Change of Cable Telephony Routing

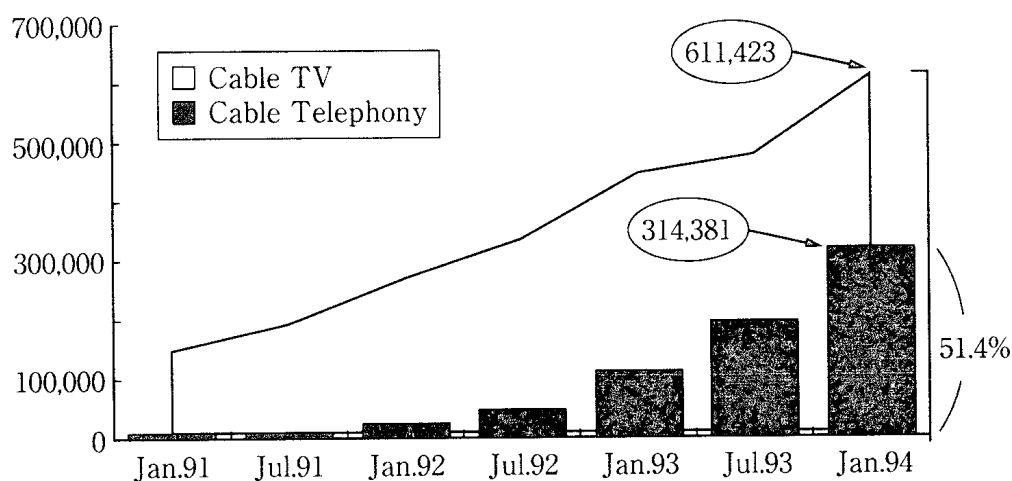


it would lose market share and might do something about it, it may as well get some of the revenue back.⁽¹¹⁾

BT and other PTO's involvement in the negotiation significantly lifted up the bargaining position of MSOs. This increasing power was reflected in the interconnect payments. Initially, exclusive agreement with Mercury enabled cable operators to retain between 20% and 25% of gross revenue. More recently, they could retain 50% after paying PTOs in the form of interconnect payments.⁽¹²⁾

The greater profitability and more potential arising from having their own switches attracted more investors. At the same time, this new favorable cost structure enabled MSOs to offer lower prices, which attracted more customers , and thereby promoted the subscription num-

Figure 6. Cable Telephony Growth



Source Cable TV Association

ber.

4-2. The Market Condition

Figure 6 shows the growth of UK cable telephony.

Considering rather modest growth of cable TV itself, the growth rate of telephony is highly impressive. Over the course of 1993, around 188,000 residential exchange lines were added compared with only 139,000 TV subscribers.

The main explanation of this phenomenon is the churn in the base of TV subscribers. Applying 30% churn rate, as Cable TV Association estimates, the number of churn for the year is around 142,000. Hence, the growth addition of TV subscribers are 281,000 (139,000 net addition + 142,000 churns). Bearing in mind that the telephone service, being just started, was experiencing little in the way of churn, the growth addition could be estimated 207,000 (188,000 net addition + 19,000 churns, applying 10% churn rate.) From these numbers it appears that as many as 74% of subscribers taking television service were taking cable telephony as well. However, this calculation does not count the number of existing TV subscribers who incrementally applied for cable telephony. The number of these subscribers, although no data was available so far, should not be ignored, or rather, it could be quite large depending on MSOs strategy and promotion.

Table 4. BT's Market Share

	1992*	1993*	1994*
Residential (line rental+traffic)	100%	97%	95%
Business (line rental+traffic)	90%	87%	83%
International (business+residential)	79%	76%	72%

Soumce : Directors' Report 1993, 1994, BT * the year ended 31 March

In spite of the rapid growth, cable's presence in the telecommunications market was still small in the early 1990 s. The number of line connections in 1994 was less than 1.6% of BT's 20 million. Given all that

(I) cable telephony was only available to some 70% of total home even with full operation

(II) the average penetration of cable TV in newly built franchises was around 30%,

(III) estimated proportion of telephone subscribers in cable TV viewers was 74%,

the cable telephony market share in exchange line connections was theoretically less than 20%. (i.e. $70\% \times 30\% \times 74\%$)

As Table 4 indicates, until 1992, BT had virtually monopolized residential market in contrast with other business and international markets where competition had already started. Therefore, even with limited potential for market share, the impact of cable telephony presence was large enough to influence BT's corporate strategy.

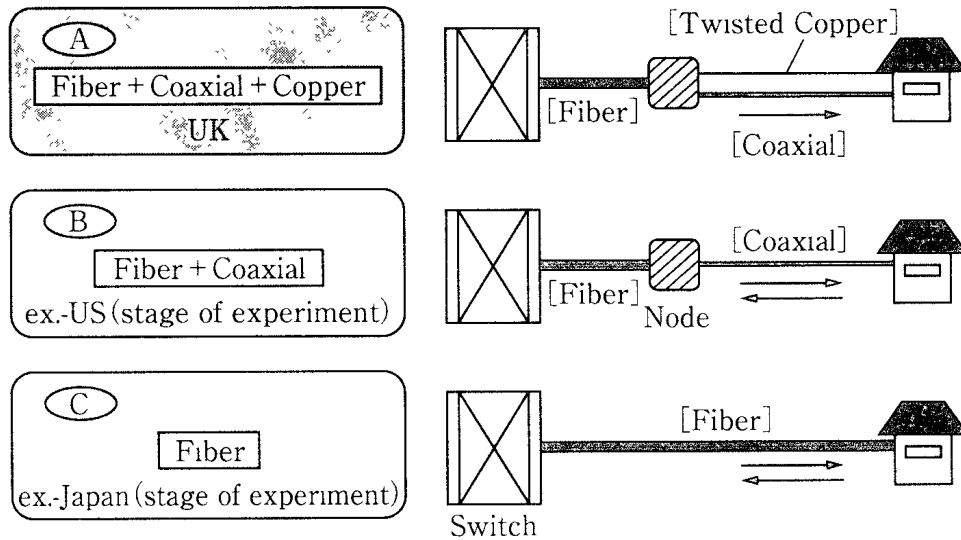
4-3. Applied Technology and System

Theoretically, there are some alternative system structure through which cable operators provide telephony service.

In the UK, the hybrid system of fiber optics, coaxial cable and copper twisted pair cable, was applied (system A in Figure 7) whereas, for example, in the US with valuable coaxial cable as national assets, general movement of future cable telephony at least in the short term was seeking for system B⁽¹³⁾.

The greatest advantage of system A was lower cost. Setting the cost of system C (only with fiber optics) as 1, the construction cost of A was

Figure 7. Alternative Systems of Cable Telephony



Source NTT

between 0.4 and 0.5 in 100,000 line connection base, and was between 0.7 and 0.8 in one million base at the stage of early 1990 s. In the case of UK cable, the construction scale of each franchise was closer to 100,000 lines, hence, the cost saving effect was more significant than the case in which a large national operator was planning to construct a nation-wide infrastructure as in Japan.

The other advantage is confidentiality. Since operators provide two different lines, coaxial and copper twisted pair, the latter could be used exclusively for voice telephony while the former is only for television. Thanks to this independence, no technological problem happened in terms of communication security, which is the first technological hurdle for system B and C to overcome.

Nevertheless, in the long term, system A is inferior in respects of interactivity due to the use of copper cable with very limited capacity. Hence, it is generally argued that the system is not suitable to the ideal Multi-Media age, lacking potential extension. Moreover, with continuous technological progress, the cost advantage of system A is most likely to diminish. According to Nippon Telegraph and Telephone Co.(NTT), around 2000 and onward the exclusive fiber optics system could be most advantageous both in cost and capacity (a million line base). It should also be noted that upgrading systems ($A \Rightarrow B \Rightarrow C$) implies a large waste of

Tabl 5. Price Discount Rate of Key MSOs

Operators	Line Rental	Local	National	International (USA)
Diamond Cable	na	15%	13%	2%
NYNEX	na	21%	12%	2%
Telewest	15%	15%	9%	2%
Videotron	10%	18%	5%	4% premium
(Mercury 2300)	10% more	85% premium	12%	1%

Source : Dixon, Goodwin & Co.

initial investment.

Even with those disadvantages, however, the application of system A was probably the most practical choice for the UK cable telephony. At that time it started, the other systems were far more expensive and contain some technological problems to be addressed, and UK cable operators could not afford it anyway both in respects of time and money.

4-4. Price

Although the significance varies, there were some switching costs from traditional BT lines to cable telephony from the viewpoint of customers. In addition to the installation costs, some might be concerned about the new hole and line in their premises, and others would hate to change their familiar phone numbers. Hence, to attract people, cable operators had to offer some benefits to outweigh those tangible and intangible switching costs. In the circumstance that no qualitative difference of residential telephony was perceived, the required benefit was, undoubtedly, a lower price. Table 5 approximate discount rate of major cable operators and Mercury's residential service compared to the standard BT charges.

Since cable operators owned only local loop, the discount rates inevitably diminish as a call becomes longer distance. For typical international calls MSOs could offer only around 2-4% discount even by compressing their own margin. Because of this structural disadvantage, the target customers for cable telephony were most likely those who used local calls more frequently.

Table 6. Capital Costs of Fixed Network Construction

	CATV	Telecom	TV + Telecom
COST			
Network Cost per Passing	£ 300	£ 300	£ 375
Capital Cost per Sub. -CATV	£ 180	NA	£ 180
Capital Cost per Sub. -Telecom.	NA	£ 200	£ 70
Assumed Penetration	33%	33%	33%
Total Capital per Sub	£ 1,089	£ 1,109	£ 1,386
REVENUE			
Annual Revenue per Sub. -CATV	£ 220	NA	£ 220
Annual Revenue per Sub. -Telecom	NA	£ 230	£ 230
Total Revenue per Sub	£ 220	£ 230	£ 450
Revenue/Capital	20%	21%	32%

4-5. Benefits to Cable Operators

Given that technology and infrastructure required to provide cable telephony services is similar to that needed for cable TV, a significant cost saving could be expected by providing both of them. According to the Cable TV Association, the incremental cost of providing cable telephony (network cost for passing + capital cost for connection) is only 127% for providing cable TV only. By comparison, the dual revenue is 204% of the television figure. Details of cost advantages is presented in Table 6. Another researcher, BZW, also has similar estimates of those incremental costs and revenues; that is, 123% and 181% respectively.

Furthermore, the level of churn experienced by cable operators may be reduced by between 20% and 50%, depending on the franchise, according to the industry estimates. The great majority of cable customers had abandoned BT service, rather than using the cable line for outgoing calls only. This made the customer dependent on the cable operators for what was considered an essential service, and dependence greatly contribute to churn reduction. This enhanced profitability of the business by reducing the instance of uncovered fixed costs resulting from short-term connections.

In addition to those two clear benefits, there might be some synergy

effect promoting CATV sales. Telephony gave a salesperson the second chance to get in the door. Preparing two different service offers seems more advantageous than just being able to provide one television service. Early indications are that cable TV penetration can be 5 to 10% higher with telephony than without.

5. Further Research—In the Context of Multimedia—

In this report, the emergence and growth of cable telephony, along with the business environment, were discussed. However, the future prospective was not presented. There are some other areas that require more research. For example, the significance of key variables for cable growth could be studied further. It is also meaningful to analyze the business environment with some appropriate academic frameworks.

Both interactive telecommunications and multimedia, an integrated provision of voice, video and data, are considered to be one of the largest business fields in the next century although the whole industry structure and customer profiles are not clearly outlined.

The technology of UK cable telephony itself is very limited to expand because of the use of copper cable with small capacity. However, the political environment in the UK allowed the first convergence of telecoms and broadcasting, not in the technological context, but in that they are provided by the same operators. Cable companies are accumulating the experience and thereby know-how of providing video and voice service, threatening the national telecommunication carriers.

The UK cable and telecommunications market is attracting attention from most other developed countries because of its unique features. Moreover, due to this vigorous environment, it is probable that the UK will be one of the model countries which enjoy advanced multimedia/interactive service provision in the future.

This report is based on "Cable Telephony—A New Interface of Telecommunications and Broadcasting—" that was submitted in partial fulfillment of the requirements for MBA, Imperial College of Science, Technology, and Medicine in 1994.

NOTATIONS

- (1) John Moore, Former Financial Secretary in the Thatcher' conservative government, (Harvard Business Review, Jan-Feb, 1992)
- (2) Cable & Wireless was a colonial telecoms company and was nationalized in 1946. The BT Act 1981 empowered the Treasury to sell shares in C&W.
- (3) (The OECD Observer No.182, June-July, 1993)
- (4) Mercury's share in business and international market in 1991 was 6% and 15% respectively.
- (5) (Telecommunications Policy, Feb, 1991)
- (6) (UK government consulting document, Telecommunications Policy, Feb, 1991,)
- (7) Cable Authority was merged into the Independent Television Commission (ITC) in 1991.
- (8) Most cable operators excluding Nynex had coherent aggressive approaches.
- (9) This is the number of homes in its franchises, adjusted according to the size of its interest. The number reflects the presence of MSOs in the cable industry.
- (10) based on the model of Kleinwort Benson Research (Feb, 1994)
- (11) Kleinwort Benson, as above
- (12) (Financial Times New Media Market, Aug 12, 1993)
- (13) Although, in 1992, AL Gore, the US vice-president talked about wiring up the US with a network of optical fiber cable, it soon became clear that the vice president had no plan for how to develop the federal network at that time. Many critics doubt the financial feasibility and even necessity of leapfrogging the existing coaxial cable.

ACRONYM

Bsky B	British Sky Broadcasting
BT	British Telecommunications Co.
CATV	Community Access Television
EC	European Community
MSO	Multiple System Operator
NTT	Nippon Telegraph and Telephone Co.
Oftel	Office of Telecommunications
PTO	Public Telecommunications Operator
RBOC	Regional Bell Operating Company

REFERENCES

BOOKS

- Graham, *The Dictionary of Telecommunications*, 2nd ed. 1991, Facts on File
Home Office/DOI, *The Development of Cable Systems and Services*, 1984
Johnson & Scholes, *Exploring Corporate Strategy 3rd ed.* 1993, Prentice Hall
Kotler & Armstrong, *Marketing-An Introduction 3rd ed.* 1993, Prentice Hall

RESEARCH PAPERS

- B. Dussen, *Deregulation and Growth-Developments in European Cable*, 1994, the Yankee Group
G. A. Fielding? *An Analysis of the Options Open to BT, Arising from the in the UK Telecoms Network*, 1991, Imperial College
J. Dodd & K. Pelly, *The UK Cable Industry*, 1994, Kleinwort Benson Reserch
J. O'Donohue, *Globalisation of Telecommunications-BT as a case study*, 1993, Imperial College
L. B. Chong, *Aspects of Privatisation with Special Reference to Britain and British Telecom*, 1989, Imperial College
S. Kitai & M. Oishi, *Competition in the UK Local Telecommunications Market*, 1993, NTT Europe

ANNUAL REPORTS & YEARBOOKS

- BT, *Directors' Report and Financial Statemens*, 1993
BT, *Directors' Report and Financial Statement*, 1994
Central Statistical Office, *Social Trends 24*, 1994, HMSO
CTA, *The Cable TV and Telecom Yearbook*, 1992, The WOAC Comms.
CTA, *The Cable TV and Telecom Yearbook*, 1993, The WOAC Comms.
CTA, *The Cable TV and Telecom Yearbook*, 1994, The WOAC Comms.
ITC, *Who's Who in Cable & Satellite-ed. 17*, 1994, The WOAC Comms.

PERIODICALS

- BT News Release, Feb. 8 1994, *Weekday call prices slashed as BT axes Peak Rate*
Financial Times, Aug. 24 1993, *Public Services rapped*, D. Owen
Financial Times, Jan. 12 1994, *Number of cable phone subscribers trebles*, A. Adonis
FT New Meida Market, Aug. 12 1993, *Nynex is proud to be a Tortoise*
FT New Meida Market, Nov. 4 1993, *Cable's Easy ride against BT in Over*
FT New Meida Market, Nov. 4 1993, *Nynex centralises in bid to improve Performance*
FT New Meida Market, Dec. 16 1993, *BT wining back Cable customers*
FT New Meida Market, Jan. 27 1994, *More operators will go for free calls, but.*
FT New Meida Market, Feb. 10 1994, *Who owns UK cable*
FT New Meida Market, Feb. 24 1994, *Diamond cuts peak rate and thinks more radically*
FT New Meida Market, Mar. 10 1994, *Nynex, G. Cable and Videotron cuts peak*

rate

FT New Meida Market, Mar. 10 1994, *BT calls for broadcast ban to be lifted by 1997*

FT New Meida Market, May. 19 1994, *Labour would let BT run broadband services*

FT New Meida Market, Jul. 14 1994, *Five join telephony street shoot-out*

FT New Meida Market, Jul. 28 1994, *Nynex free-call offer boosts dual subscribers*

FT New Meida Market, Aug. 11 1994, *Cable takes £178m phone revenue*

FT New Meida Market, May. 26 1994, *Cable Telephony taken by 50% of cable homes*

FT New Meida Market, Aug. 4 1994, *Mercury as no response to new London competitors*

Harvard Business Review, Jan-Feb 1992, *British Privatisation-Taking Capitalism to the People*, J. Moore

NTT Review, Jan. 1993, *Activtites for Standardisation of Optical Fibre Technology*

Telecommunications Policy, Feb. 1991, *Telecommunications Policy in the UK Myths and Realities*, D. Gillick

Telecommunications Policy, Feb. 1991, *Competition and Chohec in Telecommusdcations*, R. Pye, G. Spring, & J. Yeomans

Telecommunications Policy, Mar. 1992, *Telephone-Cable Cross Ownership*, R. Gershon

Telecommunications Policy, Dec. 1992, *UK Policies and Regulations*, B. Wigglesworth & F. Barnes

Telecommunications Policy, Nov. 1993, *Cable Systems, Telephony and Local Economic Development in the UK*, J. Cornford & A. Cillespie

The Economist, Feb. 6 1993, *Telecoms in America-Couch Potato Heaven*,

The OECD Observer No. 182, Jun/Jul 1993, *Judging Telecom Performance*, S. Paltridge