Globalism and Localism in Telecommunications
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Universal Service in Japan

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1. Background

1.1. Liberalization and Competition Since 1985

Japan opened its telecommunications network to competition in 1985, when the NTT Public Corporation was privatized. In August 1986, NCCs (New Common Carriers) began leased-circuit service and in September 1987 they entered the market for long distance voice telephony. Japan has had different notions from Western developed countries in what constitutes "fair competition" and a "level playing field." Therefore, it is easily understood why Western vocabularies like "equal access," "number portability" and "universal service," have hardly been heard in Japan until recently. Japanese people prefer to resolve these issues technically rather than conceptually. The extreme example was the popularity of LCR (least cost routing) equipment, which selected the cheapest carrier automatically without dialing a four digit prefix, thus functioning in place of equal access. However, as the market is becoming global, several means of Western origin were gradually introduced in Japan.

Looking back on the history of competition and interconnection in Japan, we can identify three stages of evolution.

(1) Long distance competition without definite rule (1985-91)
(2) POI-based rule making movement (1992-94)
(3) OND (Open Network Declaration) (1995-?)

1.1.1. Long distance competition without definite rule (1985-91)

Japan was initially concerned with the feasibility of competition in the long distance market. Therefore, policy directions focused on encouraging long distance entrants rather than establishing a level playing field for all players.

1.1.2. POI-based rule making movement (1992-94)

Initially the long distance NCCs could not charge their customers for an end-to-end price, only for their long distance segment. According to the interconnection scheme at that time, NCCs who have their point of interface (POI) in the same Message Area (MA) would pay just ten yen per three minutes to NTT at one end of the call. Carriers with POIs outside the MA would pay more depending upon the distance between their POI and NTT's interconnection site. This created unequal competition among long distance NCCs.

Due to its inequality, the MPT streamlined the system in 1992. In principle, a single POI was established in each of the Japanese prefectures (similar to the U.S. LATA regions.)

For leased line service in areas where local NCCs had already established a share of the inter-prefectural market, existing interconnection points were left intact. An interconnection charge system and an end-to-end tariff were introduced in 1993.

1.1.3. OND (Open Network Declaration) 1995-?

As indicated in the incompleteness of new POI system, and also stimulated by the 1996 Telecommunications Act in the U.S., the general consensus was made that interconnection should not be limited to long distance and local. Rather, it should cover any type; local-local, local-cellular, local-CATV and so on.

The MPT focused more on structural separation than any non-discriminatory interconnection scheme which suggests a preference for NTT's divestiture. In retrospect, MPT ordered NTT to separate its data communications arm into a subsidiary in 1987, now called NTT Data Communications Systems Corporation. In 1992, MPT also requested separation of NTT's mobile communications sector, and NTT DoCoMo (literary means "everywhere"), the mobile communications subsidiary, was established. The following year, NTT DoCoMo was again reorganized into Regional Group Companies by the request of MPT.

Although structural separation facilitates open and neutral interconnection to a certain extent, it does not necessarily guarantee that unbundled functions are available at a reasonable price. To achieve this, two conditions are necessary:

(1) The dominant carrier must be willing to open the network.
(2) An arbitration system must be in place to settle disputes.

Unfortunately, NTT has acted reluctantly in opening up its network to its competitors. Complaints were frequently raised by competitors that NTT gives preference to its long distance sector, that NTT's cost data are not reliable, and that NTT often delays negotiations. However, in September of 1995, NTT announced an epoch-making decision of open network policy following its idea of OCN (Open Computer Network). This new policy can be called "OND" (Open Network Declaration) by the dominant carrier.

1.2. Market performance and tariff reduction

Ten years since the market opening, the NCC's market share for inter-prefectural long distance calls (comparable to inter-LATA calls) reached around 30% nationwide. However, NTT's market share erosion was even more dramatic in the most heavily inhabited areas -- between Tokyo, Nagoya and Osaka. In that lucrative corridor, NTT's share dropped to 45%, while the share of NCCs grew to 55%.

On the other hand, the local wireline market did not become competitive. There are over 10 NCCs in this market, most of which are subsidiaries of electric power companies. However, their combined market share for local voice telephony is almost zero percent and the electric power companies incurred large financial losses.

During this period, NTT continually reduced its long distance tariff, without raising its local tariff. NTT's tariff is distance sensitive, with the furthest-distance rate set for calls in excess of 160 km. This tariff segment dropped a quarter of its original level of NTT's price for a three minutes call, from ¥400 before competition to ¥140 after competition.

In Japan, regulators have run behind the market reality and have approached the newly competitive environment with a trial-and-error process. This is different from the U.S. and the U.K., where changes in the tariff structure for both long and local distance were brought about through the implementation of rate rebalancing and access charges. Instead in Japan, as long distance rates declined, no increases on the local side were permitted in order to offset the drain in revenue.

However, regulators have become gradually aware of NTT's seriously troubled financial situation. They understood that the low cost of the local tariff, although appreciated by the consumer, cannot be sustained in conjunction with universal service goals. There needed to be a fundamental change in the tariff structure.

In order to avoid a political reaction, MPT permitted a 30% tariff raise in pay phones, followed by a 16% raise in monthly basic charge. Both of these adjustments were implemented in two-phases during the 1994-95 timeframe. Although these adjustments contributed to the reduction of the total deficits of local services, no amendment has been made for subscriber call charges.

1.3. Interconnection charges

As was mentioned previously, "access charges" were deferred to the future, when real competition comes to a matured condition. In 1993, NTT came to an agreement with its rivals DDI, JT, and TWJ to introduce interconnection charges. Three minutes of regular access was priced nationally at 12.57 yen for each end, and 47.30 yen for three minutes of ISDN service. The NCCs were also required to pay 100% of the cost of the IGS (Interconnection Gateway Switch), up from 50%. There is also a 2.10 yen contribution per call for NTT's directory assistance service.

These interconnection agreements are re-negotiated yearly, based on NTT's profits for various service elements. Beginning April 1995, three minutes of regular access was reduced to 10.46 yen from the previous 12.57 yen level. Internally, NTT's long distance division must pay its regional divisions the same interconnection fees as its competitors do. In order to secure the level playing field between long distance NCCs and NTT's long distance sector, MPT ordered restructuring of NTT, by which the former Network Sector was recognized as a new Long Distance Communications Sector, and new POIs were also established. While interconnection agreements are bilateral, in practice the three long-distance NCCs negotiated jointly with NTT and the agreements are identical. Each agreement is approved by MPT in order to guarantee exemption from anti-trust laws.

In 1995-96, there appeared new changes in the local market structure: CATV operators wanting to provide telephony and Internet interconnection began negotiations with NTT and a new alliance was under consideration among the other local carriers. Interconnection charges are based completely upon costs without surplus for the recipient to subsidize deficit areas, as opposed to access charges which include cross-subsidization. This was a pioneering sign for the coming network of networks.

2. Universal service concept in Japan

As the Japanese legal system mostly depends upon written statute, several laws which include provisions related to universal service concept should be reviewed.

2.1. Public Telecommunications Law (PTL) Before Liberalization

PTL was enacted after World War II which prescribed the universal service concept as follows:

> **Article 1 (Purpose of this law)**
>
> This law is aimed at improving public welfare, by securing NTT-PC (Nippon Telegraph and Telephone Public Corporation) and KDD (Kokusai Denshin Denwa, Co. Ltd.) to provide prompt and stable public telecommunications services at a reasonable price to anyone universally and equally. (tentative translation by the author)

The original Japanese wording of *amaneku kouhei*, which can be translated into "universally and equally" probably comes from the following wording in the 1934 Communications Act in the United States, because then Japanese government and bureaucracy learned a lot from US experience, as shown by the introduction.

> **Section 1 (Purposes of Act; creation of Federal Communications Commission)**
>
> For the purpose of regulating interstate and foreign commerce in communication by wire and radio so as to make available, so far as possible, to all the people of the United States a rapid, efficient, nation-wide, and world-wide wire and radio communications service with adequate facilities at reasonable charges...

2.2. Telecommunications Business Law (TBL) and NTT Law

In 1985, TBL was enacted as the basic law to regulate the telecommunications business as a whole, after the market was opened to competition. In this law two provisions are related to universality:

> **Article 7 (Non-discriminatory usage)**
>
> Any telecommunications carrier shall not discriminate unfairly in providing telecommunications service.
>
> **Article 34 (Obligations to provide service)**
>
> Any Type-1 carrier shall not, without due reason, refuse to provide telecommunications service within its service territory.

However, these prescriptions guarantee only equality. As for a narrow sense of universality, NTT Corporation Law prescribes the following:

> **Article 2 (Obligations)**
>
> NTT shall... give consideration to the maintenance of its proper and efficient management and shall contribute to the securement of provision of stable nationwide telephone services throughout Japan by providing such services indispensable to the people's life at appropriate conditions and impartially...

2.3. Broadcasting Law (BL)

Japan is very unique in imposing broadcasting law (BL), the Article-34 equivalent obligation on all broadcasting companies. In addition, BL also asks NHK (Nippon Housou Kyokai), the public broadcasting corporation, to provide nationwide radio and television services, which is similar to the universal service obligation imposed on NTT. The sentence reads as follows;

Article 7 (Purpose of NHK)

The purpose of NHK is to conduct its domestic broadcasting with rich and good broadcasting programs for the public welfare and in such a manner that its broadcasting may be received all over Japan... (unofficial translation by Communication Study Group)

2.4. Japanese Way to Secure Universality

Universal service is closely linked with telecommunications market structure. There are three major types of liberalization in the world; namely the U.S. type, the U.K./Japan type, and the Continental European Union type.

Figure-1 shows how these three types differ. On the horizontal axis, each field of telecommunications is shown. The vertical axis classifies the degree of liberalization by the number of new entrants, with the top being a monopoly and the bottom being a more competitive marketplace. Thus we can characterize the three types as follows:

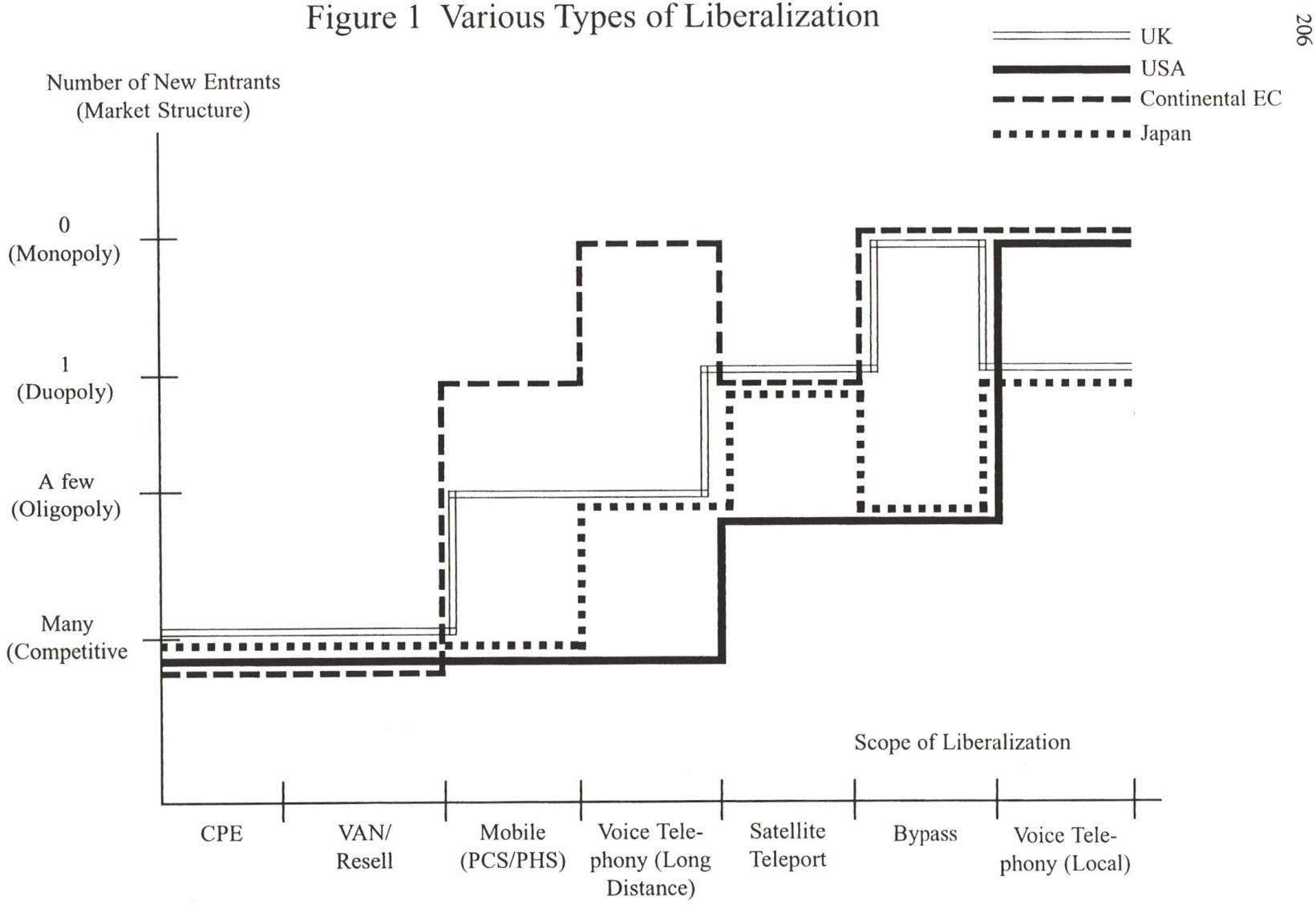
(1) In general, the US is the most "open" market. When AT&T was divested in 1984, there was a vague consensus that local telephony would be a natural monopoly for the foreseeable future. The demarcation between long distance and local depended on this assumption. However, competition soon began between local telcos and CAPs (Competitive Access Providers).
(2) The UK and Japan regulatory schemes resemble each other, regardless of their historical and cultural differences. Both opened up every field of telecommunications market. But in local telephony, the number of new entrants is comparatively small and they are still weak.
(3) Continental EU countries have opened CPE, VAN and mobile communications, while keeping a monopoly in voice telephony both in long distance and local. But they are moving toward more competitive local and long distance markets as we approach 1998.

The main issue right now is whether or not to promote accelerated local competition. The UK has already experienced cable telephony. The US has begun to open up local market by facilitating competition between telephone and cable companies under the recently passed 1996 Communications Act.

According to the three types of liberalization, there are three ways to secure universal service.

(1) On the occasion of AT&T's divestiture, universal service was maintained through "access charges" and other instruments including a USF (universal service fund).
(2) On the other hand, even though both the UK and Japan opened up every field of telecommunications, they continue to impose a special responsibility for universal service upon the leading carrier of each country either by license (UK) or by the law (Japan).
(3) In the Continental EU countries, PTTs provide service to everyone with one system under one policy. Once they open the market to competition, the issue will become how to continue what is now pure universal service.

Figure 1 Various Types of Liberalization



Judging from these observations, Japan seems to be situated somewhere between the UK and the continental EU systems. On the one hand, Japan declared an open market in all telephone services, including local. Yet, Japan seemed reluctant to accept clear-cut competition in local telephony. This has caused a vague and opaque situation in Japan.

3. Availability and affordability

3.1. Elements of universal service

There are three major documents, which describe in detail what universal service means. Two of the three are issued by US government's NTIA (National Telecommunications and Information Administration). The older one is titled "Telecom 2000" published in 1988. The newer is the "Infrastructure Report" published in 1991. A third is the OECD (Organization for Economic Cooperation and Development) paper titled "Universal Service and Rate Restructuring in Telecommunications Tariffs," and published in the same year.

According to NTIA reports, universal service is considered to contain two elements;

(1) Universal geographical availability of telephone service, regardless of subscriber location.
(2) Affordability to subscribe and utilize telephone service.

The OECD report expands the elements of universal service to four items:

(1) Universal geographical access.
(2) Universal affordable access.
(3) Universal service quality.
(4) Universal, non-discriminatory tariff.

3.2. Universal geographical availability

The main purpose of establishing NTT as a public corporation was to recover and improve telephone service in Japan, which was seriously damaged by World War II. In order to achieve this, two definite goals were set: first to fulfill the unmatched demand (backlog 3D sekitai in Japanese), and second to establish nationwide direct dialing as soon as possible.

These two goals were finally met in late 70's, almost twenty years later. Today, regardless of geography, those who wish to subscribe can be equipped with telephone connection within a few days.

In the meantime, there were several supplemental means taken to support universality.

(1) The initial service area covered only 3-4 kilometers from the exchange office due to technological limitation. This was expanded to 5 kilometers in 1972, and to 7 kilometers in 1978. Those who lived outside of this service area were requested to pay an extra charge for subscription.
(2) Islands were treated favorably, thus facilitating subscription of isolated inhabitants.
(3) Even after the expansion of the service area, some local governments established a funding system, which usually adopted an equal sharing system among prefecture, (and city or town) and individual for the extra charge.

3.3. Universal affordability

Telephony was considered a luxury by many Japanese after the last World War and as the economy began to recover. However, in pace with economic development with two-digit growth in 60's and 70's, telephone became a necessary commodity.

This was the main reason behind NTT's lengthy development of its network. NTT-PC executed six consecutive 5-year plans quite successfully; namely NTT installed more telephone sets than initially planned, which implies demand was actually stronger than anyone had forecasted.

During this process, there seemed to be little problem with regard to affordability, because purchasing power was dramatically improved in conjunction with economic growth. However, there was a problem unique to Japan in addition to the distribution of income issue common in every country.

This arose from the tariff structure. As NTT-PC's mission was to implement as many telephone sets as possible, Japanese government introduced a unique and favorable financial system to NTT-PC. Every subscriber was asked to buy a telephone bond before subscription. The amount differed depending upon the distance between the service areas and the subscriber, and whether the bond itself was exchangeable for cash at any time in the market.

This system proved to be the most stable financing tool, when there was a danger of crowding-out of telecommunications by strong financial demand for other emerging industries. But this system combined with comparatively high basic charge (monthly flat rate) imposed a burden on poorer people. Therefore, various instruments were introduced to ease the burden under collaboration between NTT-PC and the central, as well as the local, governments. These included:

(1) Payment in installments facilitated payment for public assistance recipients.
(2) Half reduction of charges for CPEs dedicated to disabled persons.
(3) Development of low-cost high quality CPEs for disabled persons.

4. Cross-subsidy and rebalancing of tariffs

4.1. From long-distance to local

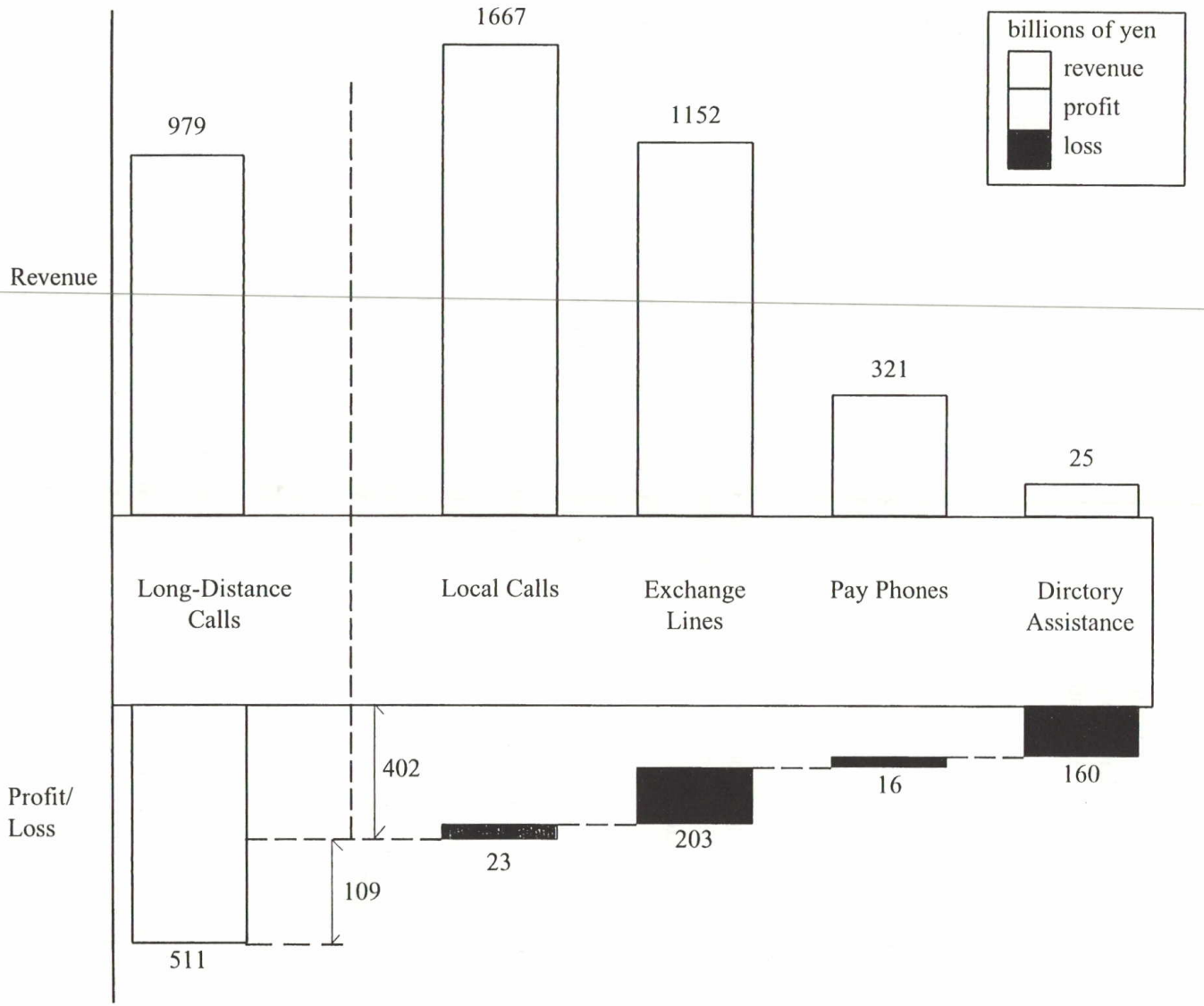
As already mentioned, Japan is more concerned about promoting new entrants rather than establishing a level playing field. Therefore it is probable that no rebalancing, or access charge system will be introduced until everybody recognizes the existence of competition.

Therefore, it is easily understood that NTT, as a universal service provider, must execute its responsibility only through a conventional cross-subsidy system. Even in FY1993 (ending March 31, 1993), almost seven years since liberalization, NTT subsidized all other services by huge profits in the long distance market (see Figure-2).

4.2. First rebalancing

In conjunction with the interconnection charge issue, partial rebalancing was first authorized by MPT (Ministry of Post and Telecommunications). The first case was with public pay phones. This approach was adopted because there is no monthly subscriber payment charged for pay phones. Therefore, MPT separately treated the pay phone tariff and the ordinary local tariff. The pay phone rate was raised from ¥10 per 3 minutes to ¥10 per 1 minute beginning

Figure 2 Revenue & Profit / Loss at NTT Telephone Service (FY1994)



April 1, 1994. During a transition period between October 1993 and April 1994, the rate was ¥10 per 1.5 minutes.

This tariff adjustment was followed by raising of monthly flat rate. As shown in Figure-2, the deficit in exchange lines, which should be covered by monthly flat rates, was so huge that MPT reluctantly admitted NTT's financial difficulty could not be eased without adjustment of this charge. The monthly charge for the largest local exchange area, over 400,000 subscriber lines, was raised from ¥1,550 to ¥1,750 for residential customers and from ¥2,350 to ¥2,600 for business customers.

There were several factors impeding the change involved in the plan. First, the charge for the smallest classes of local exchange areas, with less than 8,000 subscriber lines, will not be changed in the foreseeable future. Secondly, in the middle range areas between 8,000 and 400,000 lines, there was a one year transitional period during which the new tariff was, on average, increased fifteen percent from the previous one. The first response was attributable to maintaining "universal service," while the second was used to provide step-by-step tariff adjustment.

The telephone directory assistance service charge was also increased from ¥30 per call, to ¥30 for the first call per month and ¥60 thereafter. It is also ¥60 per call for use during the midnight rate period (11:00pm - 8:00am).

These rate adjustments compensate for some portion of losses caused in local services. However, it is still far from the "rebalancing of tariffs" in a real sense, because the local call tariff itself still remains at the same level of ¥10 per 3 minutes as before.

4.3. From Urban to Rural and From Business to Residential

Compared to the subsidy from long-distance to local, the other two subsidies are far less visible. Indeed, it is not deniable that urban customers subsidize local users and business customers subsidize residential users. This is due to the fact that long-distance NCCs focus their marketing on the high-density Tokyo-Nagoya-Osaka corridor. NTT's revenues from this area accounted for two-thirds of the total, while number of subscribers was one-third of the total.

However, when it comes to "how much," we have to recognize that the data to support the subsidizing mechanism is insufficient. Therefore, this issue must be a future study topic.

5. Universal Access Toward the Future

5.1. Information Technology and Communications Policy Forum

The first serious discussion regarding universal service was exchanged among the participants of "Information Technology and Communications Policy Forum" (ITC Forum) hosted by the Center for Global Communications (Glocom) of the International University of Japan.

This forum was initiated by Glocom to facilitate discussions regarding NTT's divestiture and to realize electronic-based debate among voluntary participants, since there was little voice from the public. The universal service issue was selected as the eighth discussion item.

In its report published in March, 1996, the ITC forum first emphasizes that the present status of competition is not sufficient to achieve the full range of consumer surplus and MPT should take a more market-oriented attitude.

"---what is truly necessary for the current telecommunications industry is creation of an environment conductive to dynamic activity by introducing drastic deregulation and open competition. Various new services should be introduced experimentally, in the hope of discovering which services are affordable and meet the needs of the users."

When competitive principles are more widely implemented, the present rate system will have to evolve into a more cost-based one. In that case rebalancing of tariffs between long-distance and local and among regions is inevitable. This problem will be particularly serious in the islands and in remote areas where population density is low and costs of network construction are high.

Therefore there is a strong need to have in place an advance plan for a social arrangement:

"capable of dealing with problems of distribution based on a new way of thinking. However, since the balance struck between efficiency and equity will greatly affect the contents of universal service, decisions concerning this balance will eventually require consensus from the entire nation."

Consequently, ITC Forum admits that their proposal must be conservative and provisional at least at the initial stage. They also admit that development of a medium to longer-term vision for universal service requires further research. However, as the initial approach, they propose the following:

(1) The Forum defines "universal service" as "information and telecommunication services ensured to all citizens, regardless of region and user circumstances, through standard cost-burden sharing."
(2) Then they propose "the rapid establishment of a third party organization that is independent of industry and MPT and has the ability and is given the power to conduct actual survey research." Within several years this organization would announce publicly their conclusions about the points below:

- open results of research on the cost structure of the telecommunications industry
- open results of research on the cost of building new infrastructure for telecommunications
- a proposal for a concrete mechanism for universal service and category of recipient, based on the above results

(3) Next, "regardless of whether NTT is broken up, we should quickly end the supply duties for universal and equal telephone services which have until now fallen only to NTT."
(4) Finally, as an interim means, they propose the followings;

- lifeline service for low income residents, and access service to telecommunications networks from isolated areas to be included as universal service

- a voucher system based on a benchmark fee system
- an organization chartered for a limited period of time for the management of funds provided by Type-1 or Type-2 carriers (or NTT stock sale gain).

Although these analyzes and recommendations look primitive and tentative, they are quite dramatic in the sense that this was the first proposal which received attention in Japan.

5.2. Study Group on "universal service and tariff which received for the multimedia age" (Study Group)

Prior to the ITC Forum, MPT began investigations on how so-called "multimedia" affects universal service and tariff structures by organizing a private study group to report to the Director General of Telecommunications Bureau at MPT. The final report was issued in May, 1996.

The Study Group built on the ideas from the ITC Forum. They first proposed four principles to expand universal service concept. They are:

- to secure access through dynamics of market mechanism
- step-by-step approach
- transparent and stable support mechanism
- development and promotion of public application by governments (central and local)

To expand the concepts, the following three points must be noted:

- flexible system to keep up with technological change and diffusion of services
- consensus to subsidize -- object, amount and means
- continuous review and adjustment

They then proposed to release NTT from universal service obligations, since competition is expected to prevail in every field of telecommunications, and establish a new external subsidy system under the following principles:

(1) neutral to competition
(2) transparent
(3) efficient management by the recipient
(4) as least cost as possible
(5) easy to understand

Finally, they tried to compare the candidates plans judging from the above mentioned criteria. Alternatives are:

a) internal cross-subsidy
b) universal service fund
c) access charges
d) voucher cross-subsidy (included only for the comparison with other external means).

Life-line and link-up type assistance are not examined, because there are great differences between US and Japan regarding income distribution.

Among the three methods, other than internal cross-subsidy, an access charge system cannot be workable if there is a dominant local carrier. And the voucher is an unfamiliar idea in Japan. Therefore, the universal service fund is the only recommendable means to maintain universality in telecommunications. However, it will require some amount of management expenditure to calculate and collect an accurate subsidy.

5.3. OCN (Open Computer Network) discussion

While the above two discussions are focused on traditional voice telephony, a new type of concern appeared when NTT announced OCN, as a new service dedicated to network computing.

There is a strong voice among heavy computer communication users that NTT's tariff is too high and too usage-sensitive. It seems almost impossible to respond to these requirements through voice-oriented network and tariff system. Then, NTT decided to establish a separate network with separate tariff structure, which is named OCN.

Although OCN provides a wide range of connections, with dial-up to 50 Mbps with near flat-rate tariff at comparable levels with US ISPs (Internet Service Provider), there is a strong concern that nation-wide availability will not be easy to accomplish.

Japan is famous for its slogan of FTTH (Fiber-to-the-Home) by the year 2010, but the actual implementation will be done depending on actual needs. CATV operators show very strong interest in providing their potential customers with Internet access capability. But their territories are mostly in high-density areas. In both cases, there is the possibility for customers living in remote areas to be left behind.

In this context, the idea of "CAN" and "Information wall socket" is worth attention. Mr. Izumi Aizu, Research Director at Glocom advocates: as far as the essence of Internet is interconnection among LANs, and interconnection must not be limited to the rich corporations but must cover citizens, Community Area Network (CAN) must be the core element of global network of networks.

CAN consists of an "information wall socket" in every household which is connected to the in-house LAN, and "information loop," which connects neighboring in-house LANs. These facilities will be provided or financed not only by common carriers and service providers, but also by public sectors including central and local governments.

In "the last one mile" issue for example, (Mr.Aizu prefers "first one mile" rather than "last," because he represents the users), potential providers will range from telecommunications carriers and CATV operators to utility companies (electricity, gas, water supply), sewage companies, road construction companies, satellite providers (stationary, geostationary), and wireless providers. Most of them would be private companies, but some of them may be public, and a few may be third sector.

The most important issue is how to combine competition and cooperation in the following five factors;

(1) Build -- anyone can build
(2) Own -- anyone can own
(3) Operate -- anyone can operate

(4) Participate -- anyone can participate
(5) Use -- anyone can use

This discussion gives us a glimpse of a different kind of universal service. In previous official discussions, the debate is focused mostly on the traditional concept of universality. In the last case, discussion is centered on how to secure universality in computer access, which inevitably includes the issue of who builds, owns and operates (BOO).

6. Concluding remarks

Universal service concept was first advocated by Theodor Vail, then President of AT&T, as early as 1908. It lasted almost three quarter century without significant change. But, it now faces two challenges.

Firstly, fierce competition squeezes surplus which has been the source of subsidy. How can we maintain universality in the competitive environment?

Secondly, from a more active viewpoint, telecommunications started from analog voice telephony and now has progressed technologically to digital signals capable of carrying multiple types of data and media. Which services should be included as universal service? And who should be responsible to secure universality including the BOO of the networks?

Advanced economies facing with these two questions, try to find their own solutions on a trial-and-error basis. But at the same time, one country's decision immediately affects another country, as the world becomes more global.

In this context, I hope this paper describing Japanese situation is also of some help to the non-Japanese readers.

Table 1 History of Competition & Interconnection in Japan

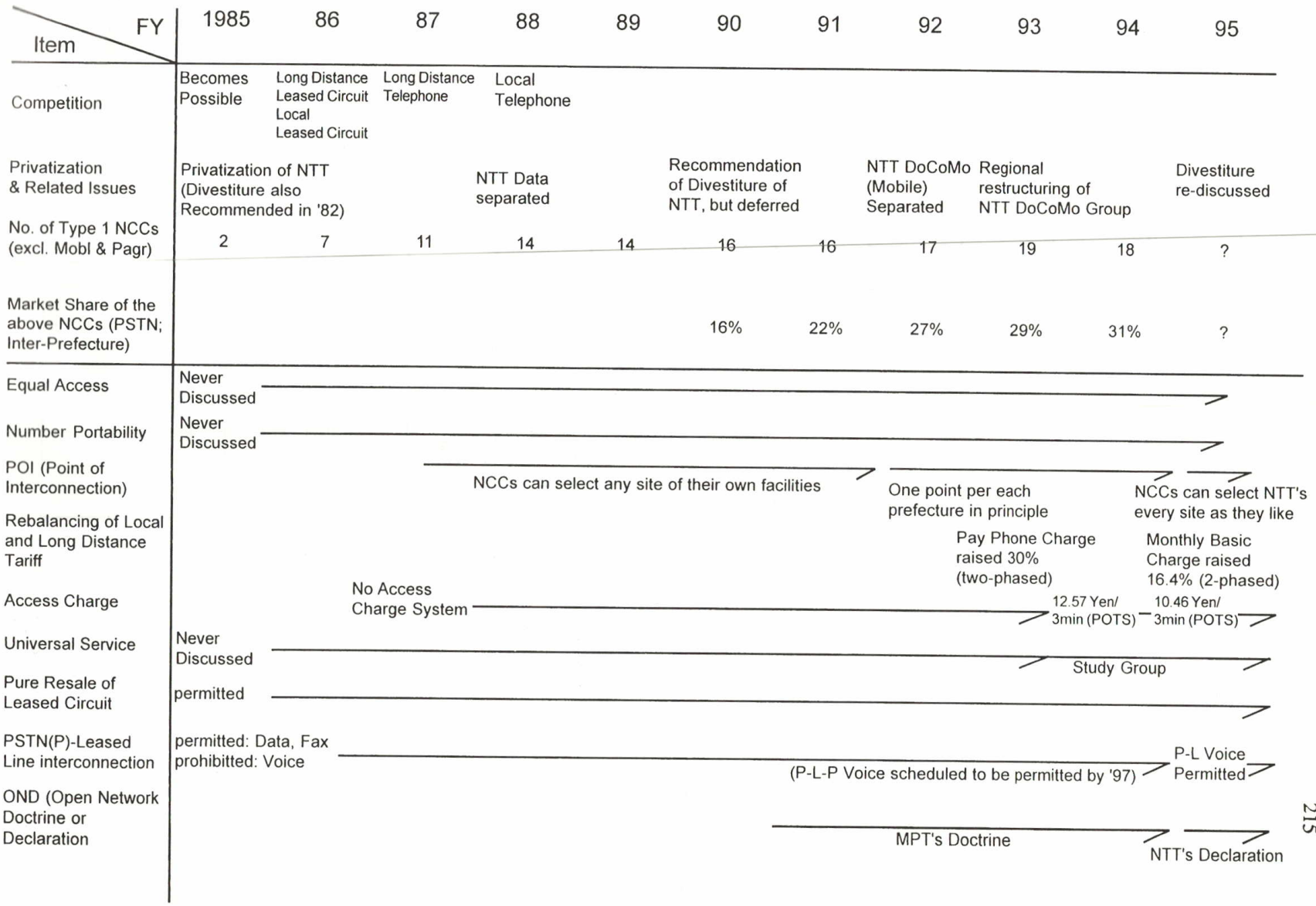


Table 2 NTT's Financial Results by Local Service Unit (LSU)
(FY 1995, in billions of Yen)

LSU	Tokyo	Kanto	Shin-etsu	Tokai	Hokuriku	Kansai	Chuyoku	Shikoku	Kyushu	Tohoku	Hokkaido	Total
Revenue* (R)	9,357	11,369	1,824	6,099	1,219	9,679	3,228	1,617	5,752	3,609	2,465	56,224
Expense (E)	8,004	10,165	2,010	5,734	1,356	9,106	3,471	1,937	6,282	4,121	2,774	54,963
Income before income tax (R-E)	1,353	1,204	-186	365	-136	572	-243	-319	-529	-511	-309	1,260
Expense/ Revenue ratio E/R*100 (in %)	86	89	110	94	111	94	108	120	109	114	113	98