Mid-Term and Long-Term Prospects and Policies for the Supply of and Demand for TV's

Byung-Yoo Hong

Working Paper 8601

July 1987

Institute for Communications Research

Greatefully acknowledged are helpful comments and suggestions from research fellows at ICR, especially Dr. Sung-Baik Oh. I am also indebted to Sung-Yong Park,Sang-Yirl Nam for providing most capable research assistance.

I. SPECIAL CHARACTERISTICS OF TELEVISION DEMAND AND THE FORECAST METHOD THEREOF

1.1 The Special Characters of TV Demand and the Forecast Method Thereof

There are two ways of quantitatively estimating the demand for durable goods. One method uses the new demand as the dependent variable of the demand function while the other method takes advantage of the durable characteristic of the good and uses the accumulated quantity in the possession of consumers as the dependent variable. Studies predicting the demand for durable goods such as cars use both methods. Other studies predicting the demand for goods such as telephones, which are a part of a system or network, employ accumulated quantity as the dependent variable(f1). The choice of the method depends on the strength of the product's independent characteristic relative to the strength of the product's system character. For this reason, the number of cars serve as the dependent variable in functions to forecast the demand for cars and the number of telephone subscribers, as opposed to the number of telephones, serve as the dependent variable in functions to forecast the demand for telephones.

---

1. Hong, Byung Yoo, Long-Term Development Plan for the Communications Sector, Institute for Communications Research, Research Paper, 1985. 12, p.5.

The TV lies somewhere in between the car and the telephone in terms of the relative strength of these two characteristics. Since TVs depend on the broadcasting networks for one-way transmission services, the TV's independent character is weaker than that of the car. On the other hand, since TVs cannot yet function as a multi-directional communications system, TVs lack the mutually dependent system character of telephones.

The ambiguous characteristics of TVs cause some confusion in forecasting demand for TVs. Thus, a demand forecast method which is a mixture of the two methods described above is necessary.

As previously noted, TVs have a stronger independent product character than does the telephone. Therefore, in forcasting the demand for TV sets, the number of TV sets is widely used as the dependent variable instead of the number of subscribers to the TV network. However, the TV set also has a degree of network product character, which creates difficulties in distinguishing between the number of TV sets and the number of subscribers to the TV network.

This problem is particularly serious in countries like Korea where the TV viewing fee is high relative to per capita income. Large disparities exist between the number of TVs registered and the number of TVs estimated to be in the possession of the public. The reason for the disparities may be due to the viewing fees which countries impose in order to support the operation of publicly managed broadcasting stations. The disparity is particularly prominent in Korea, Japan and Italy.

The aforementioned inaccuracies in counting and a lack of time series data arising from the short history of color TVs limit the feasible methods for forecasting demand. Nevertheless, it is common to treat the TV as an independent product. However, the number of TV sets are not directly used as the dependent variable. Instead, the method widely used in the indirect method of estimating the possession rate per household, is to take the basic limit for subscribing to TV networks, and then to estimate the number of TV sets.

The Japanese Electronics Industry Promotion Association (JEIPA) forecasts Japan's demand for TV sets(f2). First, the JEIPA forecasts the number of households. Second, the JEIPA estimates the rate of color TV possessions per household and forecasts the demand of those households buying their first TV sets(new demand) and those households buying additional TV sets (additional demand). Lastly, under the assumption that the substitution rate of TV's form a poisson distribution, the Association estimates domestic demand by adding the new, additional, and substitution demands.

The Korea Development Institute (KDI) used a method similar to that of the JEIPA in forecasting the demand for color TVs in Korea. The KDI estimated the function for the TV possession rate and then calculated the demand for color TVs. The income elasticity of the TV

---

2. Japanese Electronic Industry Promotion Association, Long-term Prospects for the Electronic Industry, 1980.9.,pp. 472-480.

possession rate measured from domestic time series data and the KDI'S TV possession function was between 3.38 and 4.22.

Finding the elasticity value to be unreasonably high, the KDI assumed Korea's elasticity to be 1.061, the elasticity derived from cross-sectional and time series data of 14 countries. The KDI used this assumed elasticity to forecast Korea's demand for color TVs(f3). However, this method fails to reflect the characteristics which are particular to Korea and ignores the possiblity of changes in the elasticity as income changed.

Korea's Industry Research Institute (ITI) also forecasts the demand for TVs. A lack of time-series data prevented the estimation of an independent function for the household possession rate of TVs in Korea. The IRI, therefore, used Japan's goemetry function.

$$Y = K.gct$$

Y: possession rate
K: saturation level
g: constant
c: constant
t: time

The IRI, however, arbitrarily lowered the saturation level of

---

3. Kim, Yung Ta, Korea's Color TV Industry, Korean Development Institute

Japan's possession rate from 1.56 per household to 1.2 per household and then, used the same method as the JEIPA to forecast the demand for TVs(f4).

This type of research results may provide some usefulness in forecasting short-term demand, but are inappropriate for forecasting the demand for long-term policy purposes. The reason for this is that the saturation value of the household possession rate, which is the critical value for forecasting demand, is arbitrarily chosen and probably is inaccurate. The demand elasticity changes with the growth curve as income rises. This also changes the saturation value. Therefore, a model using regression analysis on time series data will be inadequate regardless of the R2 value and, as pointed out in forecasts of the demand for autos and phones, may lead to serious miscalulations(f5).

For the foregoing reasons, the Institute for Communications Research (ICR) forecasts the demand for TVs in Korea by analyzing the cases of developed nations instead of using regression based on time series data.

1.2 INCOME AND THE TENDENCY TO POSSESS A TV

The most important explanatory variable for determining the

---

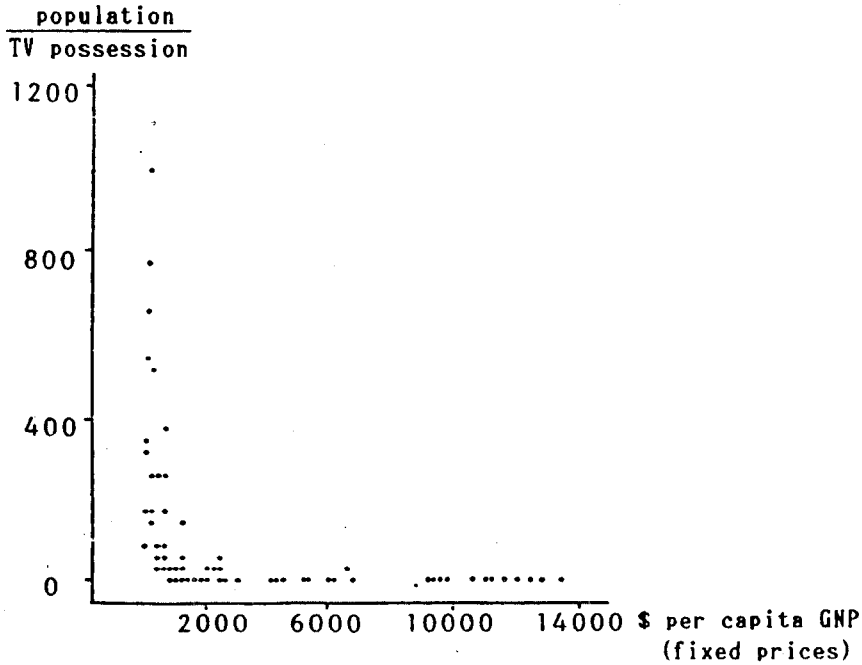
4. Hong, Nam Sun, Long-Term Supply and Demand for Color TVs and VCRs.
5. Hong, Byung-Yoo, continued from page 1.

tendency to possess a TV is a nation's per capita income. Graph 1-1 shows the relationship between per capita income and the number of people per 1 TV set in 102 countries. The two variables exhibit a strong inverse relationship. Performing regression analysis on the log transformation of these variables yields the following results:

In (number of people/ number of TVs)= 13.1 - 1.32 In

($ per capita income)

Graph 1-1: Income and the Number of People Per 1 TV Set in 102 Countries (1982 data)



Source: UNESCO, UNESCO Statistical Yearbook
*Economic Planning Board, Major Statistics of Foreign Economies, 1985.

The regression equation is similar to the equations computed for determining the tendency to possess passenger cars and telephones. For comparison, the two equations are shown below.

TELEPHONE: In (population / number of telephone subcribers)= 12.6-1.22 In ($ per capita GNP)

PASSENGER CAR: In (population / number of passenger cars)= 12.3 - 1.18 In ($ per capita GNP)

The telephone equation describes the relationship between income and the number of people per one telephone subscription in 108 countries. The other equation, relating to passenger cars, describes the relationship between income and the number of people per one passenger car in 126 countries(f6). The absolute value of the coefficient of the explanatory variable is greater than 1 in all three equations. Therefore, the tendency to possess these three durable goods are elastic to income. The regression analysis which were conducted with a high degree of freedom and over a broad range of income levels produced R2 values of around 0.8. Income, therefore, is a good explanatory variable for determining the demand for durable goods such as TVs, telephones, and passenger cars.

---

6. Continued from p. 8.

*Hong, Bung-Yoo, "The Demand and Supply Prospects of Passenger Cars and the Appropriateness of Small-Passenger Car Productions," Korean Development Research, KDI, 1984, Fall, p, 82.

1.3 THE SPECIAL CHARACTERISTICS OF THE DEMAND FOR TVS

The advent of the information society is creating new and diverse information services and combining existing services in various ways. The general prospect is for an increasingly more complex and diversified information industry. The role and function of TVs are changing from simple recievers to information communications equipments which can transmit and recieve sound as well as picture information. With this development,TVs will gradually lose their independent product characteristic and become a product that is a part of a system, like the telephone.

This change in the characteristic of TVs will necessitate the revision of the current viewing fee system, which charges one flat rate for each TV. As appendix 2 shows, Korea's current TV viewing fee is high relative to the country's income level, when compared with the viewing fee against the income ratio of other countries. The relatively high viewing fee has kept many viewers from registering their TVs. Future changes in the amount of viewing fees and method of collecting viewing fees will eventually affect the saturation level of the number of TVs per person. As mentioned before, this saturation level is the critical variable in forecasting the long-term demand for TVs.

In comparison to those variables related to passenger cars and telephones, those related to TVs have greater variability and lower reliability. Therefore, forecasts of the demand for TVs which are

based exclusively on past data are highly unreliable. Given these considerations, estimating the long-term saturation level of the number of TVs by analyzing the growth pattern of demand in developed countries is more useful than the method which uses an estimate of a demand function based on time-series data.

II. THE POSSESSION OF AND DEMAND FOR TVS IN DEVELOPED COUNTRIES

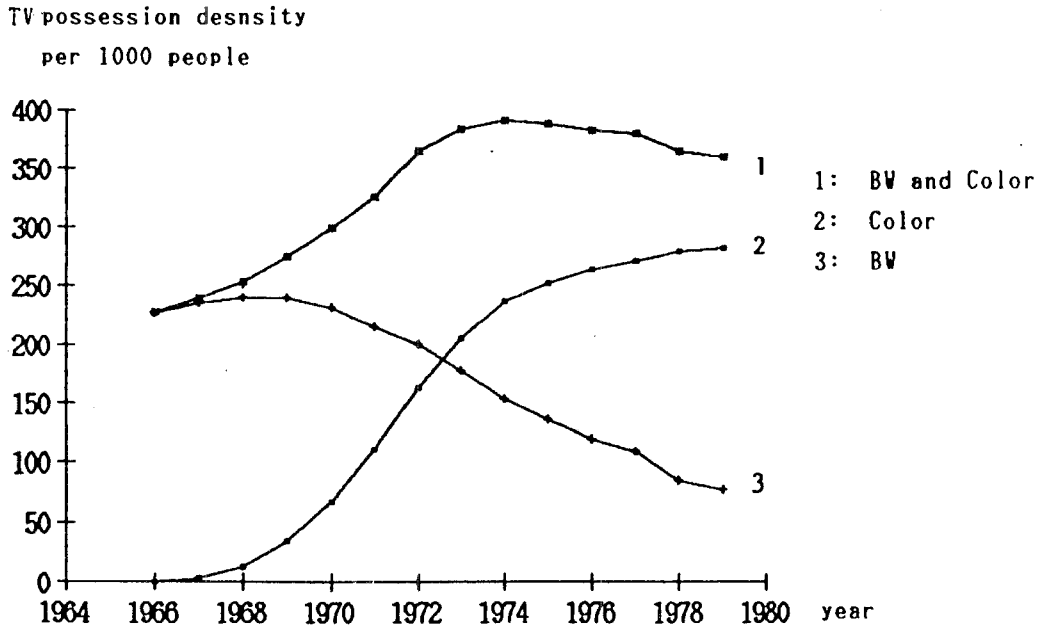
In part II, we will try to determine the relationship which exists between per capita income growth and the possession density of TVs in 19 countries, including the U.S.A., Canada, Japan, Germany and England. Analysis will begin with Japan which had the most detailed data and allowed examination of the growth process of TV possession from the very early stages.

2.1 CASE STUDY OF JAPAN

This section analyzes the growth process of TV possession in Japan. Graph 2-1 shows the possession densities(the number of TVs per 1000 people) for both color and black and white ('BW') TVs in Japan from 1966 to 1979.

The color TV curve exhibits a typical logistic curve form, rising rapidly up to 1974 and then gradually converging to a possession level of around 350 TVs per 1000 people. In contrast, the BW TV curve reaches its highest level of 250 TVs per 1000 people in the late 60's

Graph 2-1: Possession Densities of TVs for Japan



Source: Radio Wave News, Electronic Industry Yearbook.
*Statistics Department of General Affairs, Yearbook of Japanese Statistics.

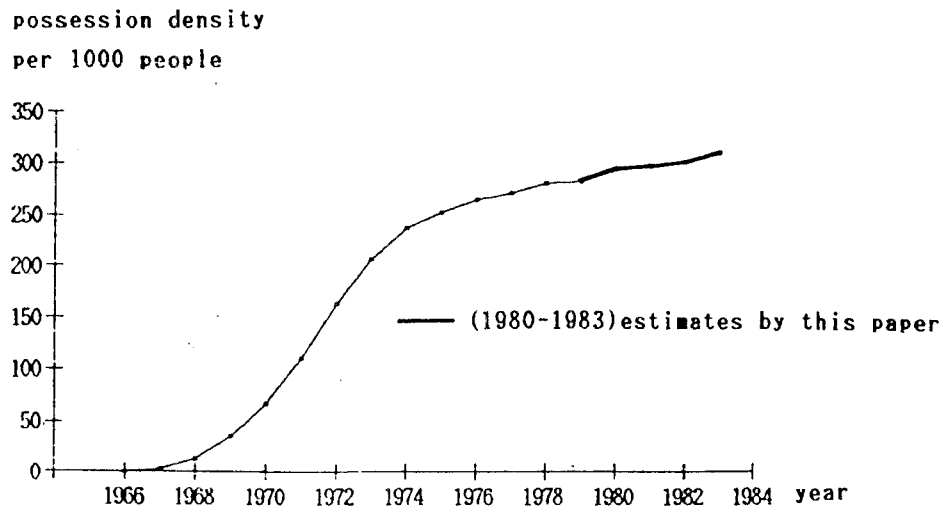
and then exhibits a continuing downward trend, which seems likely to converge to the 0 level. The total TV possession density curve reaches its peak in the mid 1970's and then exhibits a gradual diminishing trend. This behavior may be the result of prematurely substituting BW TVs with color TVs. If consumers buy color TVs before their BW TVs depreciate, then such consumers will have 2 TVs until their BW TVs breakdown, resulting in a transient peak level above the true saturation level.

The aforementioned characteristics of Japan's TV possession density curve also appear in Japan's demand density curve. In graph

After the mid 1960's, the shipment density of color TVs rises rapidly to an extreme value of 60 per 1000 people. The shipment density of color TVs then declines erratically and seems headed for a saturation level of about 50. Therefore, BW TVs and color TVs seem to have the same saturation level of shipment densities.

The saturation level of the shipment density of TVs(50) is approximately 1/7 of the saturation level of the possession density of TVs. Graph 2-3 shows the saturation level of the color TV possession density to be around 350. This leads to the inference that the average life of Japanese TVs are approximately 7 years.

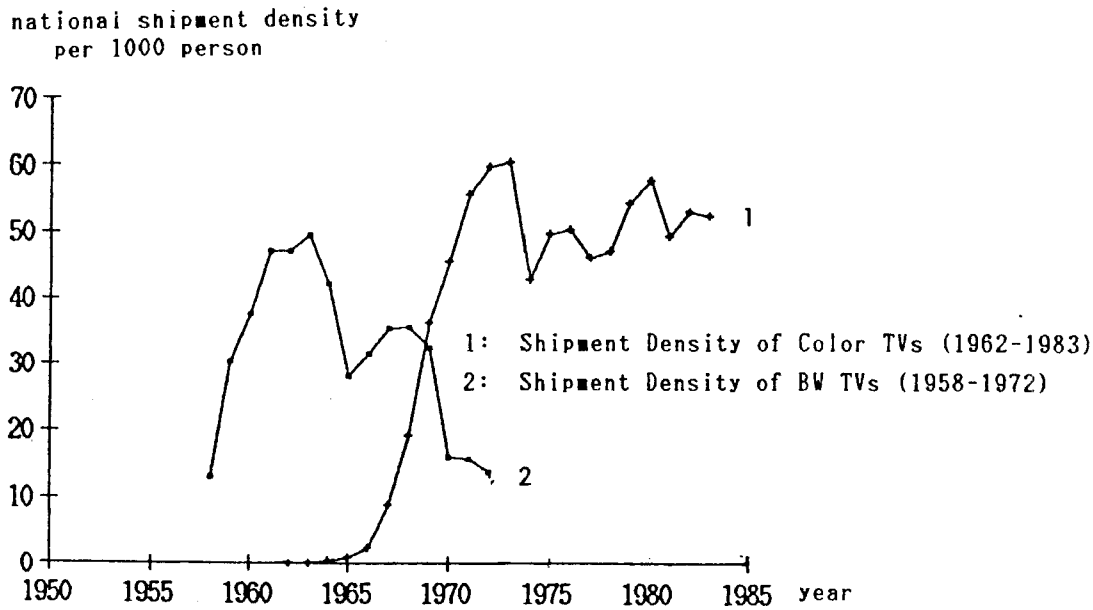
Graph 2-3: Trend of Color TVs - Possession Density in Japan



Source: Radio Wave News, Electronic Industry Yearbook.
*Statistics Department of General Affairs, Yearbook of Japanese Statistics.

2-2, the curve of Japan's TV shipment density (the number of TVs shipped for domestic consumption per 1000 people) displays these characteristics. The shipment density of BW TVs grows rapidly in the early stages and reaches its highest level in the early 1960s. Afterwards, the shipment density of BW TVs steeply decrease as color TVs increase in popularity. At the peak of the BW TV shipment density curve, the shipment density(50) comprises 1/5 of the highest BW TV possession density level (250). The density of 50 can be considered to be the saturation level for shipments of BW TVs. This saturation level lasts for only three years becuase of the substitution of color TVs for BW TVs.

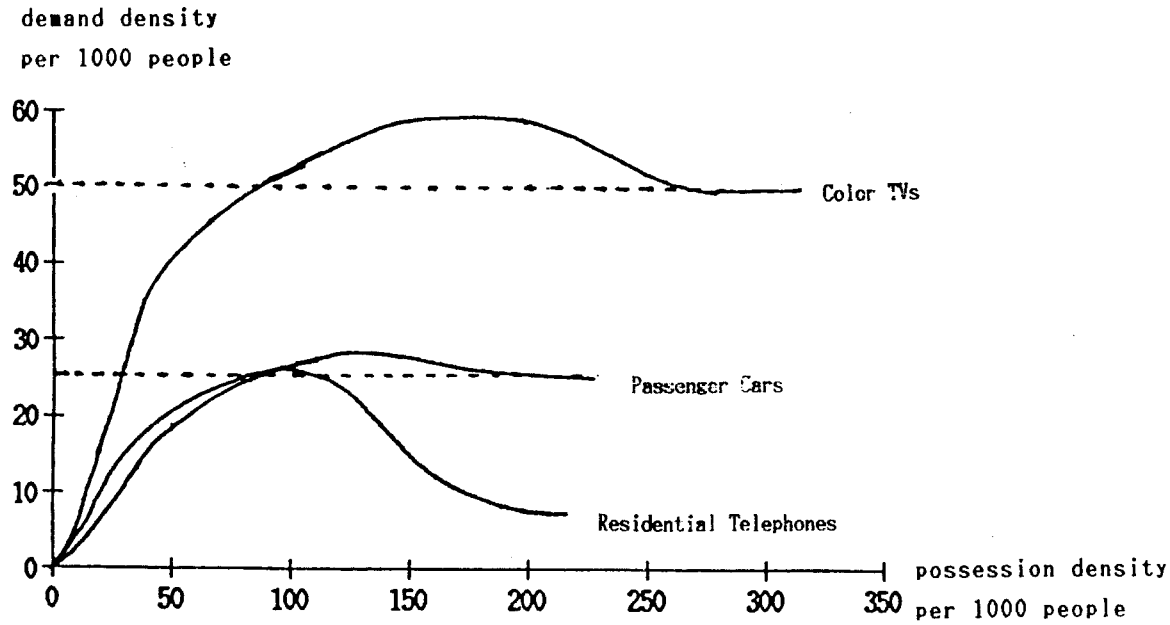
Graph 2-2: TV Shipment Density of Japan



Source: Radio Wave News, Electronic Industry Yearbook.

The curves in graph 2-4 depict the movements in the demand densities of TVs, passenger cars and telephones in relation to changes in each product's possession density. These three curves display a great deal of similarity.

Graph 2-4: Comparison of the Demand Densities of Color TVs, Passenger Cars, and Residential Telephones for Japan.



Source: Radio Wave News, Electronic Industry Yearbook.
*Japanese Automobile Industry Association, Automobile Statistics Yearbook, 1965-83.
*NTT, Telegraph and Telephone Industry Report, 1972-83.

First, the demand curves for TVs and passenger cars which contain a constant substitution demand, maintain a steady level of demand after reaching their saturation levels. Telephones, on the other hand, have no substitution demand and therefore, the demand curve for telephones decline after reaching the saturation level.

Second, when the possession density of each product reaches 100 per 1000 people, the demand densities of all three products are near their highest levels.

Third, for TVs and passenger cars which have no supply restrictions arising from being a part of a system, a relatively short time of 5 years is required to go from a point of rapid rise in demand density to a point of stability in demand density.

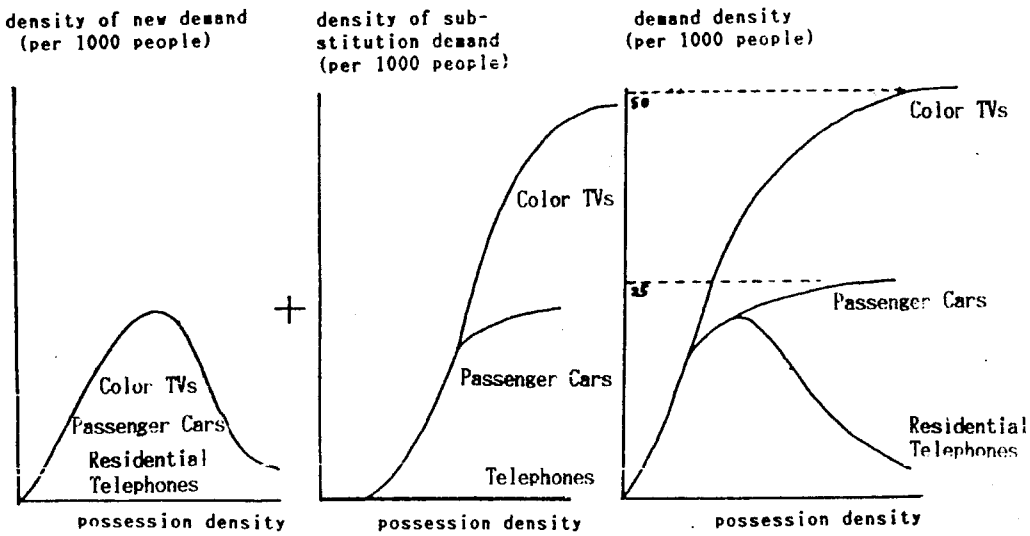
Fourth, the saturation levels of the possession densities of passenger cars and TVs are in the range from 250 to 350 per 1000 people, while the two product's saturation levels of the demand densities are spread further apart. TVs have a saturation level of 50 and passenger cars have a saturation level of 25. This reflects the fact that, for Japan, the average life of passenger cars is 10 years while the average life of TVs is 7 years.

Lastly, all three products have saturation levels of possession densities in the range from 250 to 350 per 1000 people and their demand densities rise rapidly to the level of 100 and then either stabilize or descend.

Graph 2-5 which allows comparisons of the special characteristics of the demand for TVs, telephones, and cars, shows that the factor determining the saturation level of the demand density is substitution demand, not new demand. During the rapid growth stage, new demand overwhelms any substitution demand. As demand density approaches the

saturation level, however, substitution demand overwhelms new demand. Graph 2-5 shows that for residential phones, the demand for which is entirely composed of new demand, the demand density curve converges to 0 at the end. In contrast, the demand density of color TVs converge to a level of 50, which is equivalent to the possession density saturation level divided by the average life of the product. Similarly, the demand density of passenger cars converge to 25, equivalent to the possession density saturation level (250) divided by the average life of cars (10). Therefore, the final saturation level of the demand denity curve of a product is the product's possession density saturation level divided by the life of the product.

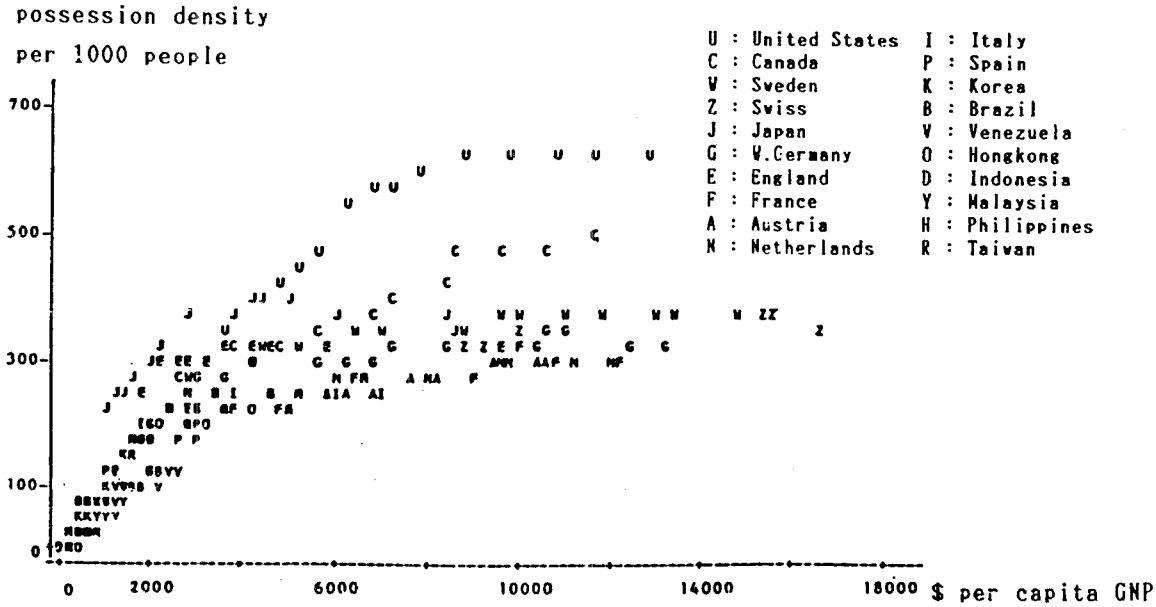
Graph 2-5: Special Characteristics of the Demand for TVs, Passenger Cars and Telephones.



2.2 CASE STUDY OF DEVELOPED NATIONS

In regards to other developed countries, a lack of data limited our analysis to the convergence level of TV possession densities. Among the developed nations, there is an average of 15% difference between registered and estimated number of TVs in possession. Considering that the estimated number is likely to be closer to the actual number and that a small deviation will not be a significant problem for our research objectives, our analysis will proceed on the basis of the estimated numbers of the countries.

Graph 2-6: TV Possession Density for 20 Countries



source : UNESCO, UNESCO Statistical Yearbook.
*Economic Planning Board, Major Statistics of Foreign Economies, 1985.

Graph 2-6 shows the changes in the possession density of TVs with repect to income growth for 20 countries. Four of these countries, the U.S.A., Canada, Japan, and Sweden, also appeared in the study on telephones. Of these four nations, the U.S.A. has the highest saturation level, followed by Canada, Sweden, and then Japan. This order is the same as the one for the saturation levels of the possession densities of telephones. Furthermore, the different saturation levels for TVs fall in to three basic categories as did those of telephones and passenger cars(f7). Chart 2-1 shows the three different classifications for the possession density saturation levels of TVs.

Chart 2-1: Possession Density and Saturation Level of TVs

Type	Satruation Level	Country
Europe	300 out of 1000 person - 350 out of 1000 person	England, France,W.Germany Italy,Japan,Sweden,Netherlands
North America	500 out of 1000 person -	Canada
	650 out of 1000 person	U.S.A.

---

7. Hong, Byung Yoo, Long-Term Development Plan for the Communications Sector, Institute for Communications Research, Research Paper, 1985. 12, pp. 46

Another interesting point is that the value of the highest saturation level was approximately two times the value of the lowest saturation level. This result is also similar to the results obtained in the studies on telephones and passenger cars. Both residential telephones and passenger cars had possession density saturation levels of 250, 350, and 500 per 1000 people, with the highest level being two times the lowest level.

The saturation levels for TVs are slightly higher at each level than those of cars and phones. This may result from including both the number of TVs for individual and public use in the estimate for TVs. If TV possession densities were distinguished between TVs for individual use and those for public use, then the saturation levels for TVs for individual use would more closely approach the saturation levels of residential telephones and passenger cars.

The factors which determine the possession density saturation levels for TVs are not known. Applying basic economic theory, however social, cultural and economic factors combine to determine such saturation levels. Therefore, the case study of Japan which has many similaritics to Korea should be of much assistance in analyzing the situation in Korea.

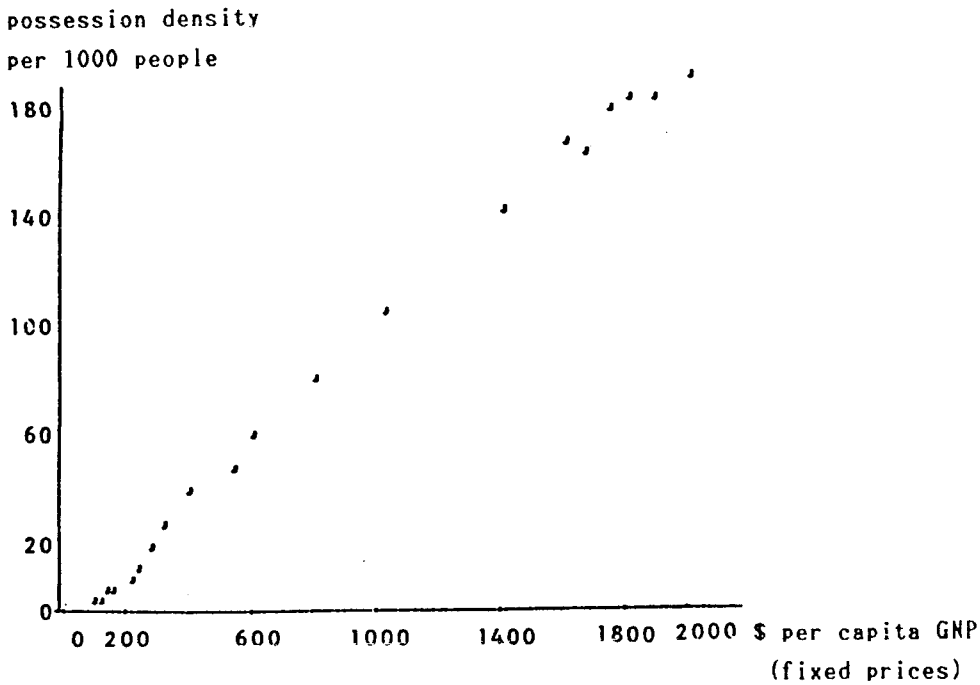
III. LONG-TERM PROSPECTS FOR POSSESSION AND DEMAND OF TVs IN KOREA

Using the facts learned through the case studies of developed countries, this section will try to determine how Korea's long-term TV

possession density and demand will develop.

Graph 3-1 shows the movements of Korea's TV possession density according to changes in $ per capita GNP (in fixed prices). Beginning in the mid 1960's, the supply of TVs slowly expanded with the increase in per capita GNP. When per capita GNP broke the $200 level in 1970, the possession density in TVs began to increase rapidly. The rapid increase slowed down in the 1980's as the TV possession density curve reflects the beginning of a stable saturation stage. The TV possesion

Graph 3-1 Long-Term Prospects for TV Possession in Korea

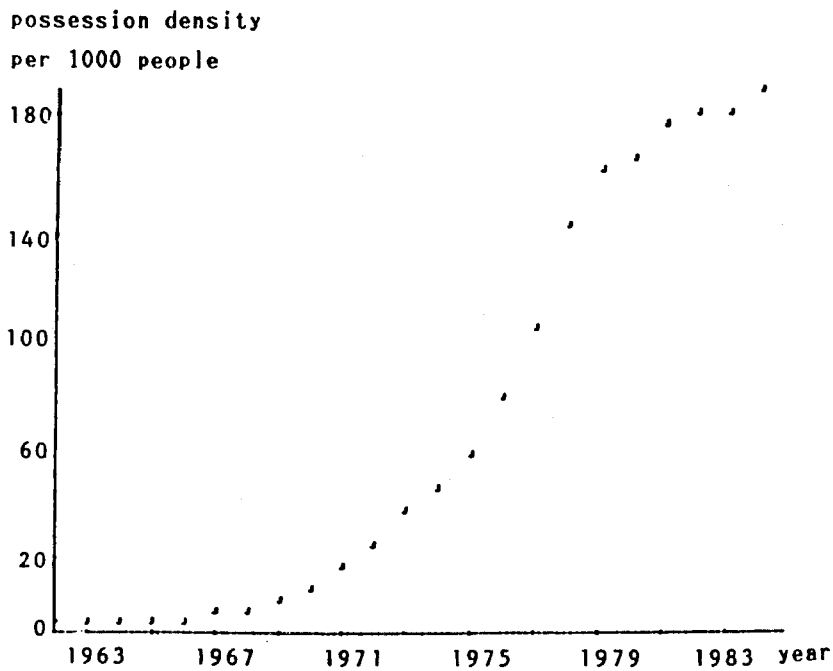


Source: Korean Association of Korea, Statistics of Electronic and Electric Industries.
*Economic Planning Board, Major Statistics of Foreign Economies, 1985

density curve exhibits the form of an almost complete growth curve. The growth curve form is even more evident in graph 3-2 which shows the annual movements of the TV possession density curve from 1964 to 1984.

Graph 3-1 and 3-2 are plotted with the official data of KBS which contains only the number of TVs in possession that have been officially registered. The registered number of TVs is much smaller than the actual number of TVs in possession and is, therefore, an inadequate basis for long-term forecasts.

Graph 3-2: Long-Term Prospects for TV Possession in Korea (II)



Source: Electronic Association of Korea, Statistics of Electronic and Electrical Industries.

This report will independently estimate time-series data on the TV possession density in Korea. Afterwards, the reliability of the estimated data will be evaluated by comparing the registered and estimated possession densities of Korea with the registered and estimated possession densities of Japan. Comparing the shipment densities of Korea and Japan will give another means for evaluating the reliability of the estimated TV possession density of Korea. The results of the estimations and evaluations will be combined with the conclusions from the case study of developed nations to compute the long-term prospects for the number of TVs in possession in Korea.

There are two ways to estimate the actual number of TVs in possession. One method is to conduct sampling analysis. The other method derives an estimate of the number of TVs in possession through TV shipment statistics. Manpower and time considerations make the later method the most desirable one for this report.

Under the later method, we sum up the number of TVs shipped for domestic consumption since 1970, the year TVs were first produced and marketed in Korea. Then, we estimate the number of TVs which are discarded every year by using the poisson distribution of the expected life of TV sets(f8). The number of TVs in possession is estimated by subtracting the number discarded from the total number of TVs shipped.

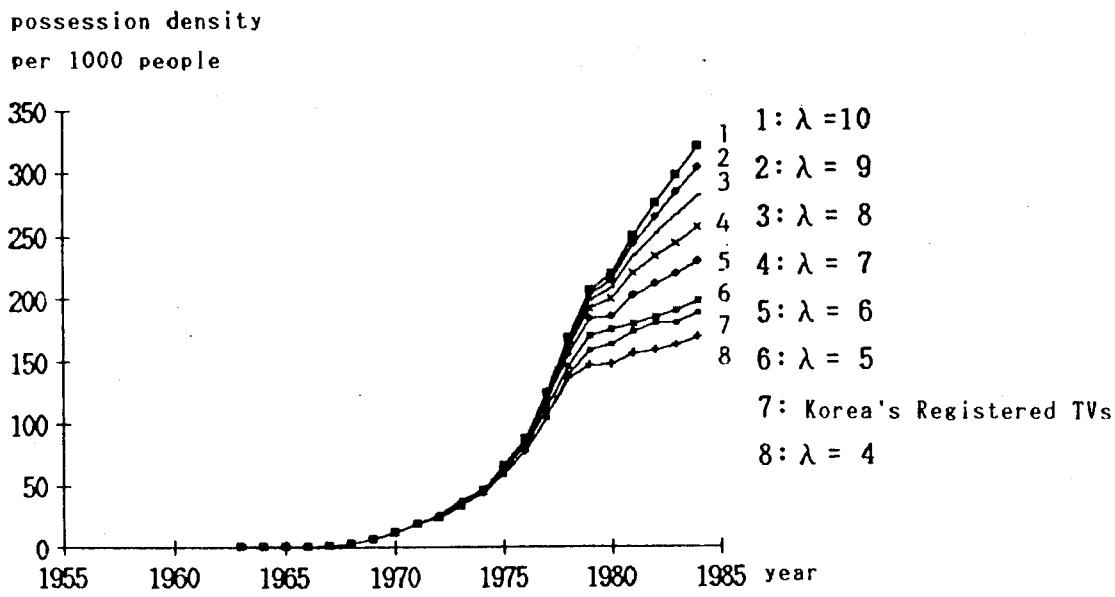
---

8. Japanese Electronic Development Association, Long-Term Aspects of the Electronic Industry, 1980.

Since the exact expected life of TV sets are not known, seven different life estimates were used to derive seven different estimates of TV possession densities. Graph 3-3 shows the curves of these seven different estimates.

The possession density curve derived from TV registration figures falls in between the estimated possession density curves of 4 and 5 years, the average life of TVs. If the TV registration data is accurate, the average life of TVs would be less than 5 years. Since it is widely known that TVs last from 5 to 10 years, the TV registration data must seriously underestimate the actual number of

Graph 3-3: Comparison of Registered Possession Density and Estimated Possession Density

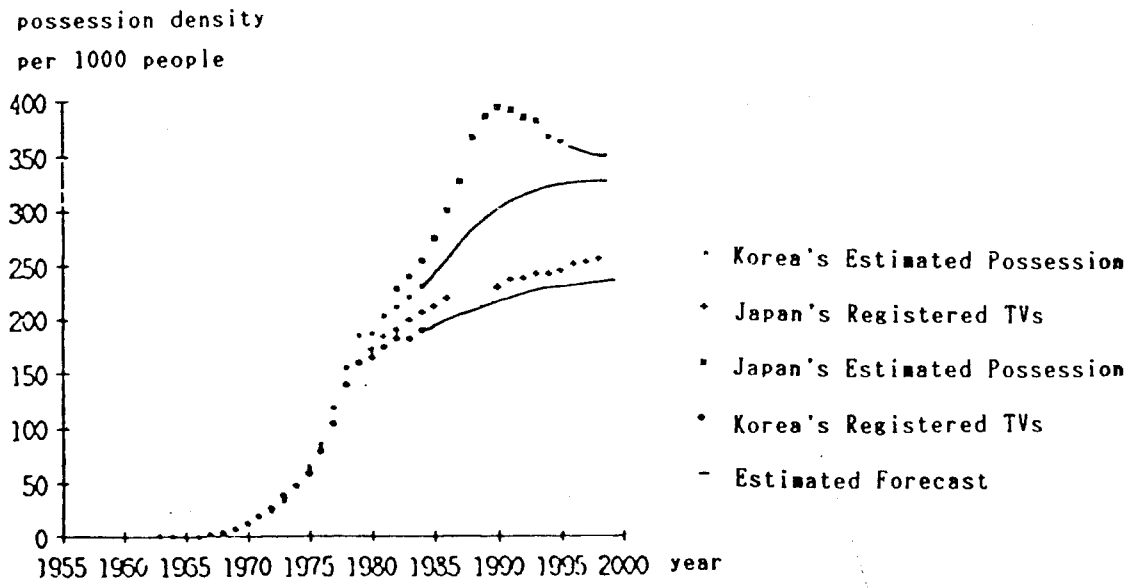


Source: Korean Broadcasting System, KBS Yearbook.
*Electronic Association of Korea, Statistics of Electronic and Electrical Industries.

TVs in possession. Sampling investigations by the Institute for Communications Research indicate the average life of Korean TVs to be 6.5 years. Although less than the 7 year life of Japanese TVs, 6.5 years will be accepted as the estimated value and used for deriving the estimated possession density curve of Korea.

Graph 3-4 shows the registered possession density curve and the estimated possession density curve for both Japan and Korea. The future values of Korea's estimated possession density (the solid portion of the estimated possession density curve) is based on an average TV life of 6.5 years. The forecasted values appear in chart

Graph 3-4: Comparison of Registered Possession Density and Estimated Possession Density in Korea and Japan



Source: Korean Broadcasting System, KBS Yearbook.
=Radio Wave News, Electronic Industry Yearbook.
=UNESCO, UNESCO Statistical Yearbook.

3-1. To draw a more effective comparison between the Korean curve and the Japanese curve, the Japanese curve was shifted forward by 16 years, the difference in time between the beginning of color TVs marketed in Japan(1965) and in Korea (1981). Shifting the Japanese curve makes the starting points of the two countries' curves coincide and facilitates the making of comparisons.

Chart 3-1: Korea's Future Estimated Possession Density

Year	Population	Domestic Production Demand	Substitution Demand	New Demand	Total Possession	Per 1000 Person
1985	41176	2000	1257	743	10623	258
1986	41785	2000	1332	668	11291	270
1987	42384	2000	1408	592	11883	280
1988	42965	2000	1494	506	12389	288
1989	43541	2000	1588	412	12801	294
1990	44127	2206	1688	518	13319	302
1991	44690	2234	1779	455	13774	308
1992	45256	2263	1859	404	14178	313
1993	45812	2291	1933	358	14536	317
1994	46358	2318	1996	322	14858	321
1995	46894	2345	2058	287	15145	323
1996	47417	2371	2112	259	15404	325
1997	47917	2396	2164	232	15636	326
1998	48422	2421	2210	212	15847	327
1999	48897	2445	2251	194	16041	328
2000	49355	2468	2287	181	16222	329

The estimated possession density curve of Japan reaches its peak in 1980 (1964 in actuality) and then gradually descends to a convergence level. This behavior probably reflects the gradual dissolution of an excess number of BW TVs before the BW TVs actually depreciate. The estimated possession density curve of Japan seems to be converging to a level of about 350 TVs per 1000 people.

In contrast, the registered possession density curve of Japan is slowly but continually increasing. This indicates that the errors in the registered data are being corrected and that the registered number and the estimated numbers are approaching each other. In the later half of the 1990's (1980s in actuality), as the estimated possession density approaches the convergence level of 350, the difference between the estimated and registered possession densities is approxiamtely 100 TVs per 1000 people.

The estimated and registered possession density curves lie below the corresponding curves of Japan. However, the difference that separates each set of curves is slight, approximately 20 to 30 TVs per 1000 people. The difference between the projected values of Korea's estimated and registered possession densities, approximately 80 to 130 TVs per 1000 people, is also comparable to the difference between the projected possession densities of Japan.

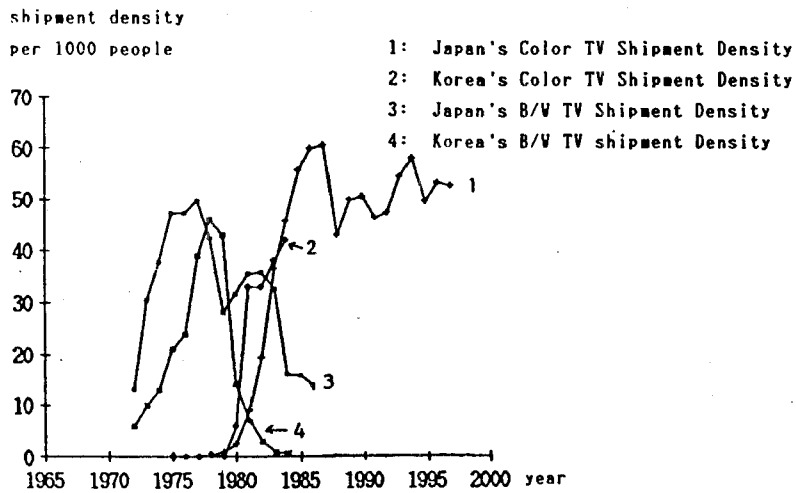
The difference in the number of TVs used for public viewing purposes may be responsible for the Korean curves lying below those of Japan. With passenger cars and telephones, the residential possession

densities of Korea and Japan were quite similar while the commercial possession densities exhibited considerable differences. The reasons for the differences in telephone and passenger car possession between the commercial sectors of the two countries seem to stem from differences in industrial structures.

In light of the relationship between the Japanese curves and the Korean curves and the relationship's similarities to those of studies on telephones and passenger cars, Korea's projected TV possession density saturation level of 300 and 350 TVs per 1000 people seems quite reasonable.

Graph 3-5 which shows the shipment density curves of color and BW

Graph 3-5: Comparison of the Domestic Production Capacity in Korea



Source: Electronic Association of Korea, Suatistics of Electronic and Electrical Industries.
=Radio Wave News, Electronic Industry Yearbook.

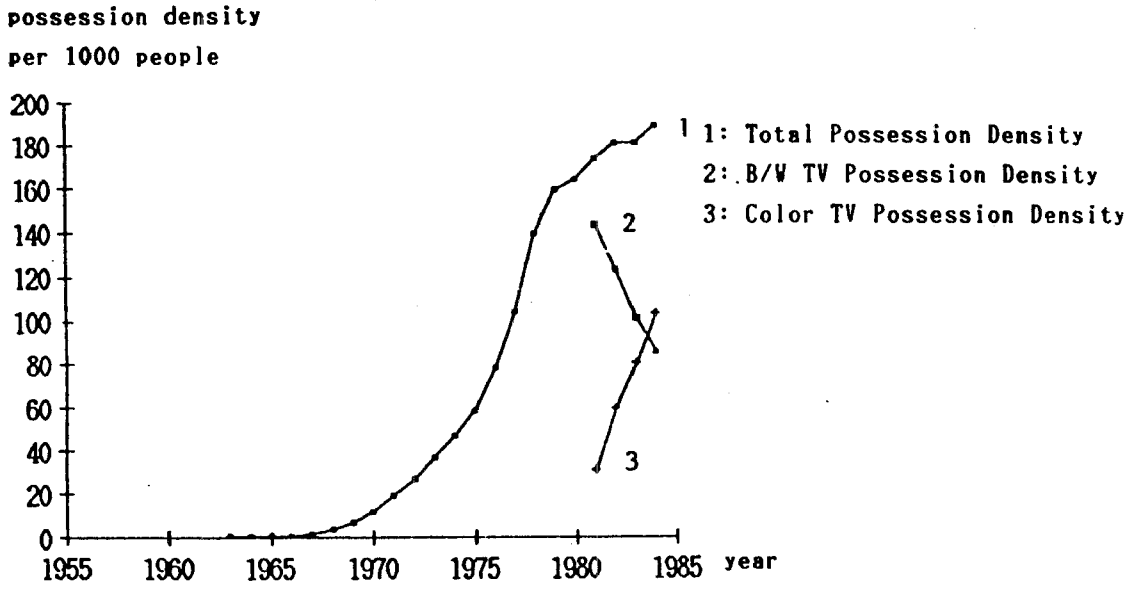
TVs for the two countries further verifies the reasonableness of the above projection. For both countries, the shipment density curves for color TVs are converging to a level of 500 per 1000 people and shipment density curves for BW TVs are converging to zero. As long as there is not a very big difference between each country's life expectancy of TVs, the projected saturation level of the TV possession density in Korea, 300 to 350 per 1000 people, is probably very accurate.

3.2 LONG-TERM POLICIES FOR THE SUPPLY AND DEMAND OF TVs IN KOREA

The previous section showed that both Korea and Japan had a difference of approximately 100 TV sets per 1000 people between the registered possession density and the estimated possession density. The difference, although similar in quantity, orginate from completely different policy sources.

Japan levies viewer fees on a per household basis (annual fee of W51,000 per 1 household) whereas Korea levies viewer fees based on the number of TV sets (annual fee of W30,000 per 1 color TV set). In Japan's case, the difference between the estimated and registered number of TVs do not present a serious problem. For Korea, however, the number of unregistered TVs translates directly into the number of TVs which are avoiding viewer fees. According to the estimates of the Institute for Communications Research, Korea had approximately 2 million unregistered TVs in 1985. Further, the difference between the estimated and registered number of TV sets is decreasing in Japan

Graph 3-6: Korea's BW and Color TV Possession



Source: Korean Broadcasting System, KBS Yearbook.

while the difference is increasing in Korea. The increasing trend in Korea will aggrandize the problems resulting from flaws with the viewer fee system in the future.

The recent discontentment with viewer fees are directed, not only at the flaws in the levying system, but also at the increases in the rates. Chart 3-2 shows increases in the viewer fees since 1969. Fees increased in a stable manner until 1981 when the monthly fee increased from W800 to W2,5000. Eliminating fees for BW TVs in 1984 did not ameliorate the 1981 increase since color TVs are almost completely replaced BW TVs. An appropriate viewer fee for Korea will be determined by analyzing the relationship between per capita income and

Chart 3-2: TV Viewer Fees Since 1969

Change in Viewer Fees		(monthly viewer fees)
69. 5. 1		300 ₩
74. 7. 1		500 ₩
79. 2. 1		600 ₩
80. 1. 1		800 ₩
81. 4. 1	B/W	800 ₩
	Color	2500 ₩
84.12. 1	No fees for B/W	

viewer fees in other countries and then considering Korea's per capita income.

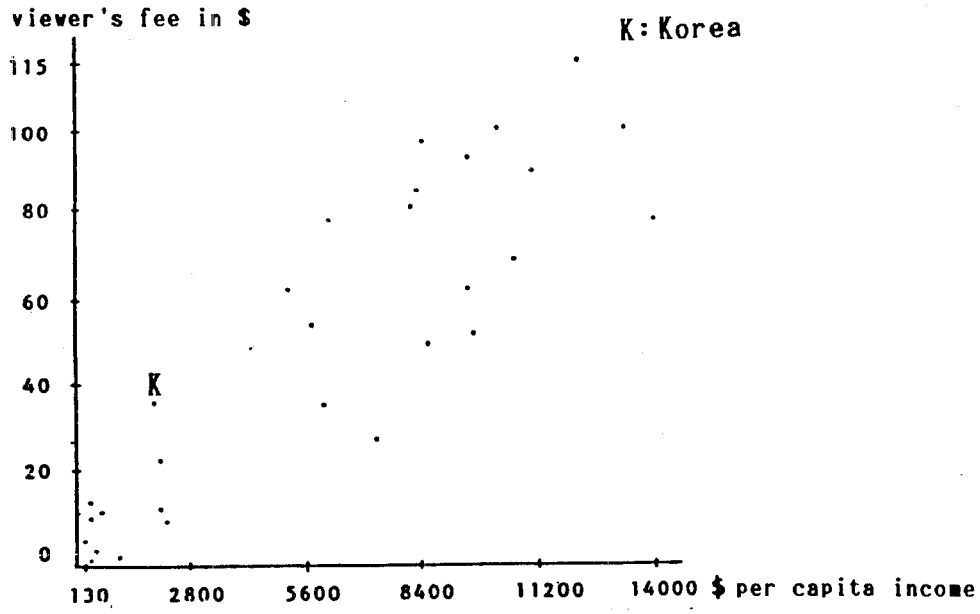
Presently, 51 countries, including Korea, levy TV viewer fees(f9). Excluding third world countries which levy fees on the basis of the amount of electricity consumed and communist countries where per capita incomes and currency exchange rates are unavailable, there are 30 countries available for analysis.

Graph 3-7 shows, in dollar terms, each country's per capita

---

9. Japanese Broadcasting Association, The World's Radios and Televisions, 1986.

Graph 3-7: Viewer's Fee of 30 Countries According to GDP



Source: Korean Export Import Bank, Directory of Countries Classified by Economics, 1985.
*Japanese Broadcasting Association, The World's Radios and Televisions, 1986.

income and the corresponding viewer fee(f10). It is easy to notice that Korea's viewer fee is high relative to national per capita income. Regression analysis on the data of the 30 countries yields the following results:(f11)

---

10. The materials provided by the Japanese Broadcasting Association reflect GDP and viewer fees according to the currency of each different country. The calculation, therefore, were converted to one currency system of the dollar on the 1983 exchange rate to facilitate this study.
11. For statistics scource, refer to appendix 2.

According to the results of the regression, Korea's annual TV viewer fee should be approximately W12,000 ($15.78 with 1983 exchange rates)(f12). Since only 51 countries out of a possible 188 levy viewer fees and most countries that levy viewer fees use a per household basis instead of a per TV set basis, the appropriate viewer fee calculated with regression results should be lowered some more.

IV. SUMMARY

The analysis, thus far, has centered on the level of viewer fees relative to income. A more comprehensive analysis considering the operating costs of a broadcasting station, the scope and cost of public interest business, income from advertising, and direct and indirect income from the public should yield a more accurate calculation of the appropriate level of viewer fees. This report attempts to shed light on the problems concerning viewer fees and is meant to be a precursor to a more comprehensive study.

The level of viewer fees and the method of levying viewer fees, in the end, will affect the medium and long-term demand for TVs. The development and distribution of new types of TVs and the creation of new broadcasting services will further affect the supply and demand

---

12. Information estimates Korea's per capita income to equal $1,884 dollars with a minimum and maximum subcription fee of 4.68 and 26.06, respectively, and a 99% confidence interval.

for TVs. Presently, it is too early to try to quantify such developments; however, such developments are likely to increase the demand for TVs.

As information transmission methods develop, information flows are taking the form of words and pictures as well as sounds. With this trend, TVs are growing in importance as TVs proceed from being simple one-way recievers to being multi-directional communication machines which transmit and receive words and pictures in formations. In order to provide an index for establishing policy and forecasting demand for new types of information services such as cable TV, videotex, etc..., this report analyzes the characteristics of TV possession trends in Korea.

Since demand elasticities of growth curves change with increases in income, statistical methods, regardless of the accurate fit of regression results, they are not sufficient nor appropriate for forecasting long-term demand. This report analyzes how the demand for and possession of TVs will change through case studies of developed countries. Useful comparisons were made with the demand patterns of passenger cars and telephones, which share many similarities with the demand pattern of TVs.

The results of the analysis are as follows:

(1) TVs are changing from being simple recievers of broadcasts to being information communication machines which recieve and

transmit picture information. With this change, TVs are losing its independent product character and becoming more of a system product character.

(2) The growth patterns of TV possession for developed nations show that most European countries and Japan have TV possession densities that converge to a level of 300 to 350 TVs per 1000 people. The saturation and convergence levels for the U.S.A. and Canada were 650 TVs and 500 TVs per 1,000 people, respectively. The saturation and convergance levels of passenger cars and telephones fell into similar classification patterns for the two countries.

(3) A comparative analysis of Korea and developed countries leads to the conclusion that Korea's TV possession will converge to 300 to 350 TVs per 1000 people, as in Japan and the European countries.

(4) Levying TV viewer fees affects the number of TVs in possession (the registered number) and will eventually affect the demand for new picture-information services. The appropriate level of viewer fees in relation to Korea's per capita income is approximately 1/2 of the current level. Further, the system of levying viewer fees should be improved by basing the fees on households instead of on the number of TVs.

Bibliography

1. Economic Planning Board, Major Statistics of Foreign Economics, Various Issues.
2. ————————, Major Economy Indicator, Various Issues.
3. Kim,Yung Bong, Color TV Industry of Korea, KDI, 1979.12.
4. ————————, The Demand and Characteristics of Fabric, Electronic Industry, KDI, 1979.12.
5. Lee, Tae Yong, The Demand for Color TV and VTR, KIET,1983.9.
6. Korea Broadcasting System, KBS Yearbook, Various Issues.
7. Hong, Byung Yoo, Future Prospects of the Demand for Telephone Subscription and the Telephone Subscription Supply Policy, ICR, 1985.12.
8. ————————, Forcast of Passenger Car Supply and Appropriateness of Small Passenger Car Production, KDI, 1984.
9. EIAK, Statistics of Electronic Industry, Various Issues.
10. NTT, Report on Telegraph and Telephone Business, Various Issues.
11. UNESCO, Statistical Yearbook, Various Issues.
12 Japan Electronic Wave News, Yearbook of Electronic Industry,Various Issues.
13. Japan Statistics Bureau, Japan Statistical Yearbook, Various Issues.
14. Hickman, Edgar P., James G. Hilton, Probability and Statistical Analysis, Intext Educational Publishers, 1971.