REPUBLIC OF INDONESIA

REPORT ON JAKARTA CITY TELEPHONE NETWORK PLANNING

VOLUME II

March 1976

JAPAN INTERNATIONAL COOPERATION AGENCY

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CHAPTER 2

TELEPHONE DEMAND FORECAST

CHAPTER 2 TELEPHONE DEMAND FORECAST

2.1 Transition of Population in Indonesia and Jakarta

In order to execute the telephone demand forecast, basic data such as present condition of telephone facilities, projection on future population and economic development indices are indespensable. Since these basic numerical values are more strongly influenced by social-economic development programs, a full study will be required when making the telephone demand forecast. Such numerical values are each described further in the following.

2.1.1 Indonesia's Present Population and Future Projection

(1) The census held in 1961, the first since Indonesia's independence revealed a population of 97 million people but the second census in 1971 totalled 120 million. This means a large increase of 23 million during the 10 year period or an average yearly increase of 2.3 million people.

(2) Numerous projections under varying conditions have been made on Indonesia's population. The main prerequisit conditions are as under.

(a) Family plan

(b) Decrease in mortality rate due to improvement in sanitation conditions

(c) Longer life span with spread of social welfare

As can be seen from Fig. 2.1.(1), in the event there is no program for family planning, the population will reach 282.8 million in 2000 A.D. If family planning is successful, however, the projection is that Indonesia's population will be 220 million, while the Central Bureau of Statistics has forecasted that it will be 201 million.

The rapid growth of population in Indonesia has been considered to have a grave influence on the development in Indonesia hereafter and the attention of the Government has turned to family planning. The National Family Planning Board in 1970 strongly stressed the necessity for family planning. Since family planning presently is not only an internal problem but a large problem internationally, the success of such planning program can be expected. Although there is some gap between the old way of thinking that having more children will bring more wealth and the new idea that less children will bring about more happiness, the family planning program can surely be successfully materialized through its effective promotion.

In preparing this telephone demand forecast, the population forecast was based on the annual growth rate of 2.37% as issued by the Central Bureau of Statistics. (Refer to Table 2.1.(8).)

The annual population growth rate in developing countries is on an average of about 2.61%, while the yearly rate in developed countries is 1.09%. Such high rate of increase in population is not a problem of Indonesia alone but a common problem in developing countries throughout the world.

2.1.2 Population Density

(1) In comparison with the population density of other countries, the density in Indonesia does not seem very high. According to Table 2.1.(3), England has the highest density with 323 people per square kilometer, followed by Japan with 277 per Km^2 and West Germany with 237 people per Km^2. Indonesia's density with 59 people per square kilometer is far below when compared with the above three countries.

(2) The main point of problem in Indonesia's population is the unequal distribution of population. As can be seen in Table 2.1.(4), Java is the island with the highest population density in Indonesia with about 565 people per square kilometer, followed by Sumatra with 38 people and Sulawesi with 37 people per Km^2. The population concentration rate in Java (including Madura) is about 64%, and this shows how much the population of Indonesia is concentrated in the island of Java.

(3) The Government of Indonesia has been carrying out a program of migration over a long period to solve the problem of unequal population distribution. It is believed that hereafter also the program of migration and economic development will be carried out in the following three regions which have lower population density, namely:

(a) Sumatra
(b) Sulawesi
(c) Kalimantan

In the 20 year period from 1950 to 1970, nearly half a million people have migrated to the above areas.

2.1.3 Population of Jakarta (Present Situation)

(1) The city of Jakarta, lying at a height of six meters above sea level with an area of 577 square kilometers, is divided into five town territories and 27 kecamatans (districts). The five town territories are:

– Central Jakarta
– West Jakarta
– South Jakarta
– East Jakarta
– North Jakarta

According to the data issued by the Census and Statistics Office of DKI, the population in Jakarta in 1971 was the largest among the cities of Indonesia, as can be seen in Table 2.1.(6).

(2) The population of Jakarta is composed of Indonesians from various regions as well as foreigners. The statistics for 1971 show that the majority of the foreigners were Chinese, i.e., approximately 93% of the foreign population.

2.1.4 Projection of Jakarta's Population

(1) Due to insufficient adjustment of statistical figures and furthermore because of the different projection conditions, the projected figures on the population of Jakarta vary.

(2) According to the "Jakarta in Progress" issued by the City of Jakarta, the rate of population growth of Jakarta is about 4% per year of which 2.8% is for natural growth and 1.2% for urbanization. On the other hand, the population projection of Jakarta is a growth rate of 5.5%, consisting of 4% for urbanization and 1.5% for natural growth.

According to the population projection data of Jakarta City, in 1991 Jakarta's population will be 12.9 million for high projection, 12.5 million for medium projection and 12.4 million for low projection. The figures used for the local telephone network plan in this report are the medium projection of 12.5, and approximately 13.85 million was projected on the assumption that the trend of increase will continue up to 1993. This projection figure is shown in Table 2.1.(8). Table 2.1.(9) shows the residential situation of people born in Jakarta and those born outside Jakarta; that is, only 51% were born in Jakarta while 49% was born outside Jakarta.

(3) In order to control the concentration of population in the city, Governor Ali Sadikin declared in August 1970 that the people residing in Jakarta must have a permanent job and a legal residence.

(4) Although Jakarta was designated as a closed city in order to solve the problem of population inflow into the city, the increase in population continues. More than any other city, the metropolitan authorities will have to make investments for the fundamental facilities as housing, roads, drainage, electricity, etc. as well as push development programs as recreation centres and others.

(5) As can be seen in Table 2.1.(10), when comparing Jakarta with other cities in the world, Jakarta with an area of 577 square kilometers has a population of 4.55 million which is 7,927 people per Km^2. Tokyo's 23 wards with an area of 577 Km^2 has a population density (14,922) which is higher than that of Jakarta. Big cities are now faced with such modern problems as air pollution, congested traffic, etc., and establishing a desirable city is a very important subject. In view of the foregoing, it is very difficult to determine the suitable population density for a city. Incidentally, since people universally say that Paris is a flowery city, a paradise city, etc., we consider that the population which can be accommodated in Jakarta would be the same as the density of Paris. When compared with the other cities in Indonesia, Jakarta not only has better job opportunities, but also is superior in all other sectors such as schools, recreation facilities, etc. It is therefore assumed that the population increase will continue for some time to come.

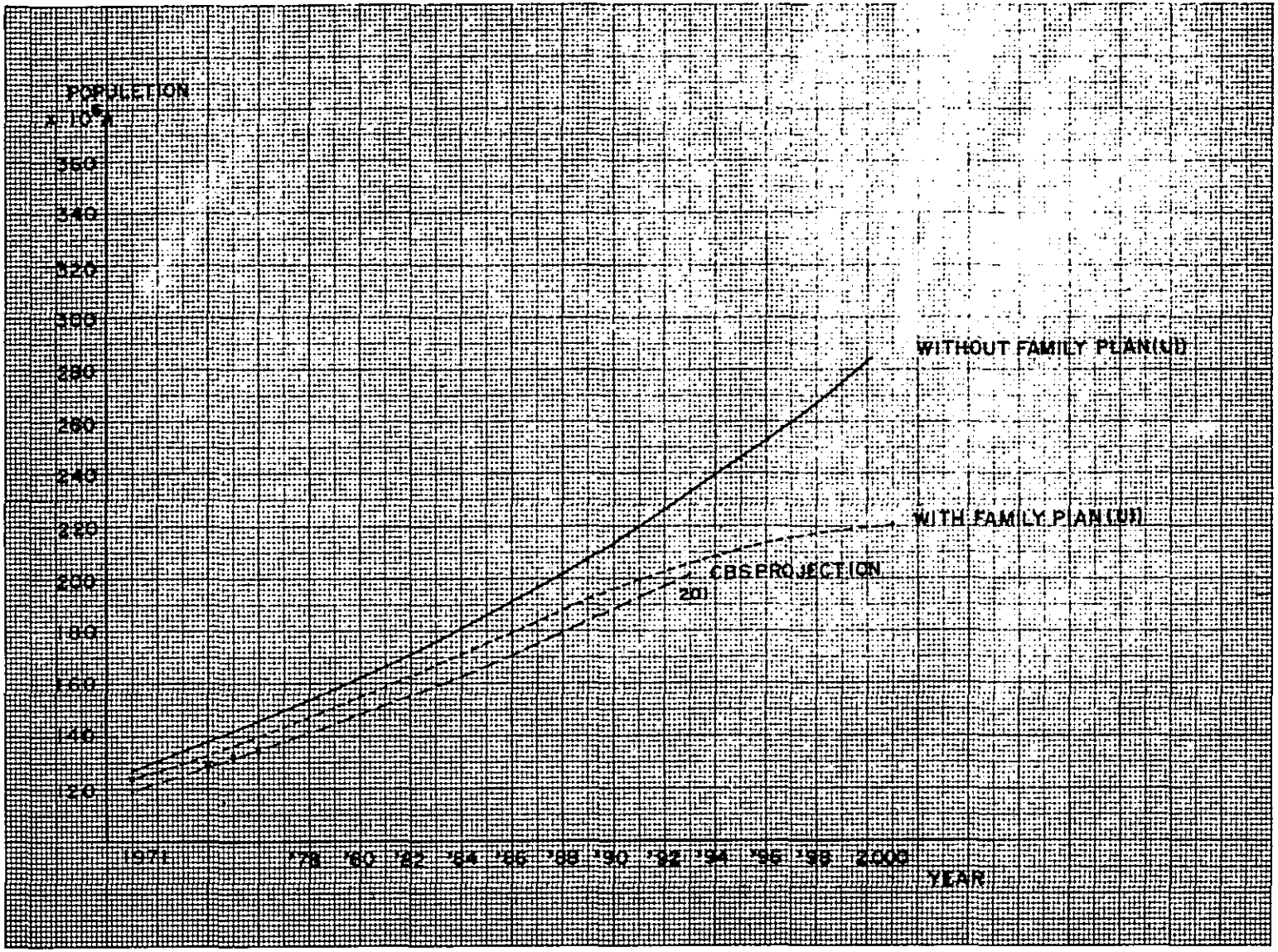


FIG. 2-1-(1) INDONESIA POPULATION PROJECTION

TABLE 2-1-(2) RATE OF POPULATION GROWTH OF SOME DEVELOPED AND DEVELOPING COUNTRIES

DEVELOPED COUNTRIES		DEVELOPING COUNTRIES	
COUNTRY S' NAME	(1963 - 1969) RETE OF INCREASE	COUNTRY'S NAME	(1963 - 1969) RATE OF INCREASE
UNITED STATES	1.2	BURMA	2.2
ENGLAND & WALES	0.6	INDIA	2.5
SWEDEN	0.8	PHILIPPINES	3.5
FRANCE	0.9	THAILAND	3.1
JAPAN	1.1	CEYLON	2.4
WEST GERMANY	1.0	AFGHANISTAN	2.1
AUSTRALIA	2.0	INDONESIA	2.5

SOURCES : DEMOGRAPHIC YEAR BOOK. UNITED NATIONS. 1969

TABLE 2-1-(3) POPULATION AREA AND DENSITY OF SOME DEVELOPED AND DEVELOPING COUNTRIES

DEVELOPING COUNTRY				DEVELOPING COUNTRY			
COUNTRY	1969 POPULATION (IN THOUSANDS)	AREA (KM2)	DENSITY	COUTRY	1969 POPULATION (IN THOUSARDS)	AREA (KM2)	DENSITY
U. S. A	203,216	9,363,353	22	BURMA	26,980	678,033	40
ENGLAD & WALES	48,827	151,126	323	INDIA	536,984	3,268,090	164
SWEDEN	7,978	449,750	18	PHILPPINES	37, 158	300.00	124
FRANCE	50,320	547,026	92	THAIAND	34,738	514,000	68
JAPAN	102,321	369,811	277	CEYLON	12,240	65,610	187
AUSTRALIA	12,296	7,686,810	2	AFGHANISTAN	16,516	647,947	26
WEST GERMANY	58,707	247,943	237	INDONESIA	119,232	2,027,087	59

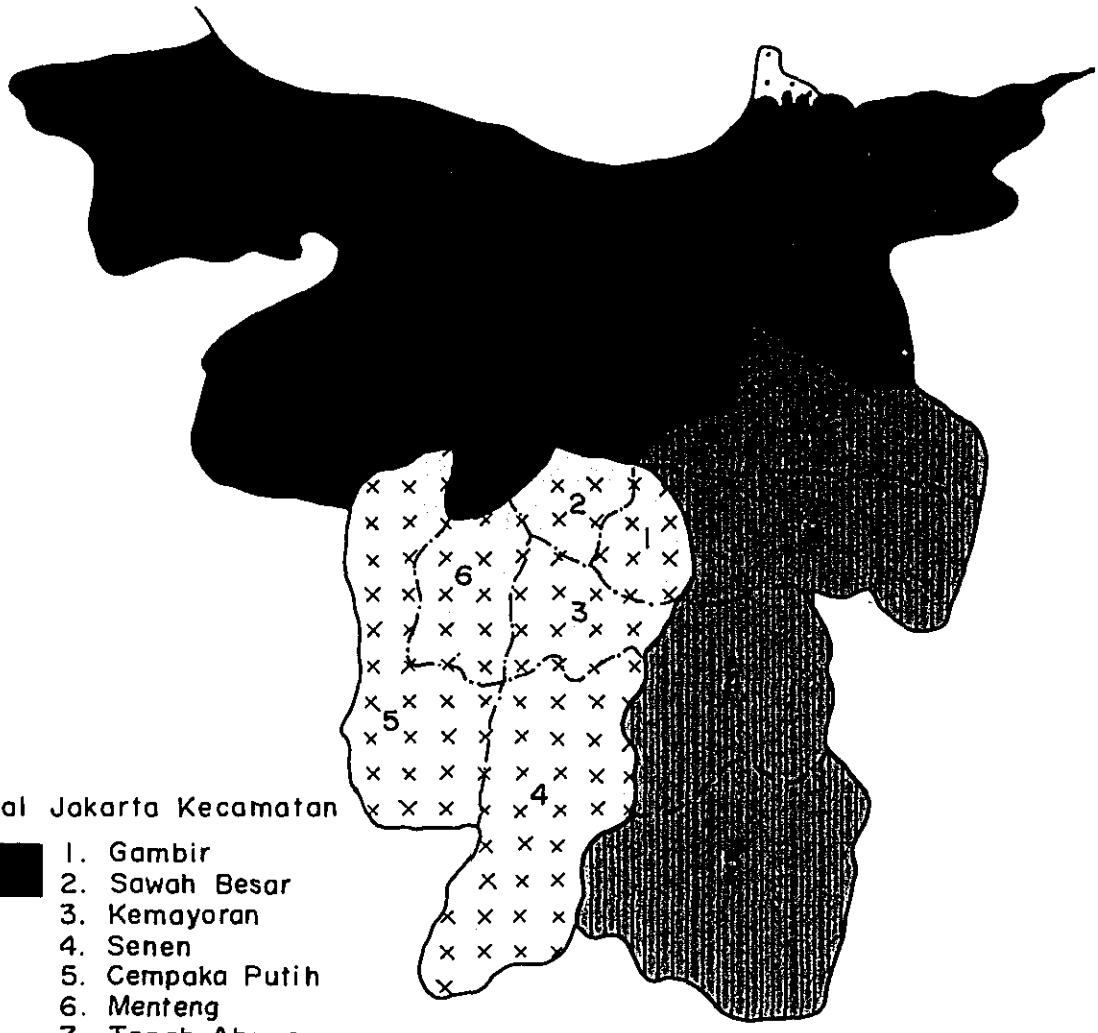
SOURCE : DEMOGRAPHIC YEAR BOOK : UNITED NATIONS. 1969.

TABLE 2-1-(4) INDONESIA'S POPULATION AND DENSITY BY MAIN ISLAND (1971)

NAME OF ISLAND	NUMBER OF POPULATION	% TO TOTAL POPULATION	AREA(KM2)	DENSITY PER KM2
JAWA MADURA	76,102,486	63.8	134,703	565
SUMATERA	20,812,682	17.5	541,174	38
KALIMATAN	5,152,166	4.32	550,848	9
SULAWESI	8,535,164	7.16	227,654	37
OTHER ISLAND	8,630,001	7.24	572,708	15
TOTAL INDONESIA	119,232,499	100.0	2,027,087	59

SOURCES : STATISTIC POCKETBOOK OF INDONESIA 1970/1971.

(BASED ON PRELIMINARY FIGURES OF POPULATION CENSUS 1971)



I. Central Jakarta Kecamatan

1. Gambir
2. Sawah Besar
3. Kemayoran
4. Senen
5. Cempaka Putih
6. Menteng
7. Tanah Abang

II. North Jakarta Kecamatan

1. Pulau Seribu
2. Penjaringan
3. Tanjung Priok
4. Koja

III. West Jakarta Kecamatan

1. Cengkareng
2. Grogol Petamburan
3. Taman Sari
4. Tambora
5. Kebon Jeruk

IV. South Jakarta Kecamatan

1. Tebet
2. Setia Budi
3. Mampang Prapatan
4. Pasar Minggu
5. Kebayoran Lama
6. Kebayoran Baru

V. East Jakarta Kecamatan

1. Matraman
2. Pulo Gadung
3. Jatinegara
4. Kramat Jati
5. Pasar Rebo

FIG. 2-1-(5) DKI JAKARTA ADMINISTRATION ARER

TABLE 2-I-(6) SOME CITIES BY POPULATION MORE THAN 100,000 IN INDONESIA(IN THOUSANDS)

NO.	CITIES	1930	1961	1971
1	JAKARTA	533.0	2,971.1	4,576.0
2	SURABAYA	341.7	1,007.9	1,556.1
3	BANDUNG	166.8	972.8	1,201.7
4	SEMARANG	217.8	503.1	646.6
5	MEDAN	76.6	479.1	635.6
6	UJUNG PANDANG	84.9	384.2	434.8
7	BANJARMASIN	65.7	214.0	281.7

SOURCES : CENTRAL BUREAU OF STAISTICS

TABLE 2-I-(7) POPULATION PROJECTION OF JAKARTA 1971-1991 (IN THOUSANDS)

ASSUMPTION	1971	1976	1981	1986	1991
HIGH PROJECTION	4,628	6,122	7,950	10,209	12,920
MEEDIUM PROJECTION	4,628	6,122	7,916	10,039	12,570
LOW PROJECTION	4,628	6,122	7,895	9,988	12,460

SOURCES : CENTRAL BUREAU OF STATISTICS

TABLE 2-1-(8) POPULATION PROJECTION OF DKI JAKARTA (1974-1993)

ASSUMPTION	1974	1975	1976	1977	1978	1983	1988	1993
HIGH PROJECTION	5,491	5,805	6,122	6,459	6,816	8,700	11,400	14,200
MEDIUM PROJECTION	5,490	5,800	6,122	6,458	6,805	8,650	10,700	13,850
LOW PROJECTION	5,484	5,800	6,122	6,450	6,794	8,600	10,000	13,500

SOURCE : UP TO 1978 CETRAL BUREAU OF STATISTICS
CONTINUED UP TO 1993 BY JTP

TABLE 2-1-(9) POPULATION OF JAKARTA BY PLACE OF BIRTH. 1961.

NO	PLACE OF BIRTH	NUMBER OF PERSONS	PERCENTAGE
1	JAKARTA	1,483,231	51.0
2	WEST JAVA	783,078	26.9
3	CENTRAL JAVA	327,620	11.3
4	SUMATERA	110,163	3.8
5	EAST JAVA	59,340	2.0
6	SULAWESI	26,679	0.9
7	JOGYAKARTA	22,446	0.8
8	KALIMANTAN	14,350	0.5
9	OTHER ISLAND	13,936	0.5
10	ABROAD	31,995	1.1
11	UNKNOWN	33,675	1.2
12	TOTAL	2,906,53	100

SOURCES : POPULATION CENSUS 1961. DKI JAKRTA

TABLE 2-I-(10) POPULATION AND DENSITY WORLD LARGE CITIES

YEAR	CITIES	AREA SQ. KM	POPULATION	DENSITY (SQ. KM)
1971	TOKYO	577	8,610,000	14,922
1969	CALCUTA	103	3,117,956	30,271
1970	NE DELHI	1,485	3,920,099	2,640
1971	JAKARTA	577.00	4,574,056	7,927
1970	TEHERAN	283	3,442,911	12,166
1970	BAGDAD	840	1,979,309	2,356
1970	SEOUL	613	5,536,377	9,031
1969	MANILA	383	1,550,000	4047
1970	SINGAPORE	5.843	2,074,500	355
1970	BANGKOK	238.60	2,213,522	9,277
1967	SAIGON	69.60	1,736,880	24,955
1969	KAIRO	214	4,769,000	22,285
1970	MEXICO	1,499	6,874,165	4,586
1968	NEW YORK	829.50	8,110,000	9,777
1970	CHICAGO	590.50	3,336,374	5,652
1969	PARIS	105.40	2,546,000	24,156
1970	WEST BERLIN	480	2,122,815	4423
1970	HAMBURG	753	1,811,450	2,406
1970	LONDON	1,579.50	7,612,300	4,89
1971	MOSKOWA	886.50	7,172,000	8,090

SOURCES : STATISTICAL YEAR BOOK OF JAKARTA. 1972.

2-2 Economic Index in Indonesia

As mentioned in the preceding paragraph 2.1, economic factors particularly GDP and NI must be incorporated when making telephone demand forecasts. Along with the economic growth of a country, the information activities will become brisk and the demand for telephones will become ever higher.

2.2.1 Social and Economic Structure

(1) The Government of Indonesia has carried out a realistic economic policy both domestically and internationally. At present, its attention is focused on a sound development of the 2nd Five-Year Plan (REPELITA II). The lst Five-Year Plan (1969 to 1973) (REPELITA I) had a number of targets; for example, the provision of sufficient food and clothing, improvement of industrial bases, expansion of housing facilities, providing of more employment, etc.

(2) Even though these targets were not attained at the end of the First Five-Year Plan, gradually the new policies were welcomed by the Indonesian people. President Suharto in his 1973 state address reported that exports showed an increase of 37% compared with the previous year; that is, the amount of exports reached a total of 1.8 billion dollars in the fourth year of the Five-Year Plan, and industrial circles have been growing stronger. According to the cost-of-living survey conducted by the Central Bureau of Statistics, the high income group of more than Rp. 100,000 per month was only 0.35%, while the Rp. 10,000 to 12,500 per month group was by far the largest, as shown in Table 2.2.(1).

A study of the ratio of expenditures allowable as telecommunication costs out of the family budget shows that a minimum income of more than Rp. 60,000 per month would be necessary for the installation of a telephone in the home. As can be seen in Fig. 2.5.(21), this income family group of more than Rp. 60,000 comprises only about 1% of the total.

(3) One reason for the high influx of population into Jakarta is the wider job opportunities offered there. On the other hand, there is a high percentage of poor families in the agricultural areas. According to Table 2.2.(2), the total labor force in Jakarta was 1,356,000 persons in 1971. Within 20 years, this figure will reach a high projection of 3,485,000 persons, a medium projection of 3,420,000 and a low projection of 3,345,000 persons, with an average yearly increase of 4.4% to 5.0%. The results of 1971 census showed that the ratio of the 15 to 54 years age group for the whole of Indonesia was 49% while that for the same age group in Jakarta was about 53%.

(4) In Indonesia, the labor force engaged in the agricultural sector is 62.2% while it is only 3.3% for the same sector in Jakarta. The majority of the labor force in Jakarta is in the service field with a ratio of 34.3% against 9.9% for the whole of

Indonesia, followed by the trade field with 23.9% as compared with 10.4% for the whole of Indonesia.

In viewing the field composition of the labor force in Jakarta, it can be assumed that the Jakarta will have big telephone demand in the future in the same manner as in other big cities in the world. The big labor force in the service and trade fields would mean the necessity for greater information activities which would further raise the demand for telephones.

(5) The rapid growth of Jakarta City is due to the increase in capital investment by both local and foreign capital. As clearly shown in Table 2.2(4), the projects approved in the period from January 1967 to December 1971 indicate a high percentage of capital investment for Jakarta. The most attractive field of investment is the industrial sector. 42.3% of the total investment projects in the industrial sector in Indonesia, or 34.3% in terms of the total invested amounts in this sector, were in the Jakarta area. In the transportation sector, 26 out of 36 projects or 72.2% are in Jakarta which is nearly 90% of the investment in this sector. Tourism also has a large percentage and 31 out of 53 projects or 76.7% of the amount invested in tourism is in Jakarta. On the other hand, foreign investment shows a very high ratio of capital invested; for example, 57% in heavy industry and 100% in the hotel business. About 35% of the total number of domestic projects are in Jakarta, comprising approximately 32% of the invested amount. Moreover, foreign investments are 47% of the total number of projects, comprising 20% of the invested capital. When considering only the sectors which are closely related to the telephone, the percentage of investment in Jakarta will be higher than the foregoing ratios.

Excluding the primary industries such as agriculture, forestry, fisher, etc., domestic investment will be about 116 billion Rupiahs. In regard to foreign investment as shown in Table 2.2.(7), investment in industries closely related to the telephone comprises 45% of the number of projects in the Jakarta area, and 51% of the amount invested in the same area. The total of both domestic and foreign investment shows that 48% is invested in the Jakarta area.

What can be said from the amount of capital invested is that investment by both domestic and foreign capital in Jakarta is very large. This trend is common in the developing countries.

To correspond with the rapid increase in capital investment in Jakarta, investment in telephone facilities should be increased. Since investment in sectors closely related to the telephone are becoming higher, full consideration should be given on this point in case of making telephone demand forecast for the Jakarta area. Furthermore, investment in the infrastructure of Jakarta keeps increasing yearly. The investment in the infrastructure of Jakarta in the 1970/1971 fiscal year was about Rp. 1.5

billion, while in the following 1971/1972 fiscal year, it was Rp. 2 billion, an increase of Rp. 0.5 billion over the previous year.

2.2.2 Present Situation in Imports and Exports

(1) Indonesia is an agricultural country, and the agricultural sector plays an important role in raising the national income. Consequently, the Government has placed a high priority on the agricultural development program in the Five-Year Plan for 1969 to 1974. This is because agriculture contributes approximately 60% of Indonesia's national income with more than 60% of the population engaged in agriculture.

Commercial commodities produced in Indonesia for the world markets are not only mineral resources such as petroleum, natural gas, tin and other minerals but include natural rubber, copra, black tea, coffee, tobacco, pepper and palm oil. It can be said that Indonesia holes high expectation in the development of the mineral resources. In particular, Indonesia now ranks as one of the crude oil production countries and contributes greatly in export earnings. The main oil fields are in East Sumatra and East Kalimantan.

(2) Oil produced in Indonesia is well known for its very high quality thanks to the low sulphur content. As can be seen in Fig. 2.2.(8), oil production in Indonesia is increasing year by year, and Japan is the largest consumer of Indonesian oil. Table 2.2.(9) and Fig. 2.2.(10) show that Japan ranks first and the U.S.A. the second.

(3) Besides petroleum which is the biggest contributor to exports, other commodities such as agricultural products, etc. play an important role in raising the national income.

The main export items of Indonesia are shown in Table 2.2.(11) and the export figures are large for petroleum, palm oil, natural rubber, wood, etc.

(4) As can be seen in Table 2.2.(12) and Fig. 2.2.(13), the present situation in imports shows a favorable trend in the gradual decrease in the import of consumable items which is good for the promotion of domestic production of such items.

(5) Jakarta as the gateway of Indonesia and an economic center carries out an important role in Indonesia's trade.

In line with the increase in international trade, not only communication with foreign countries but also the number of residing foreigners have increased and this fact gives a greater impetus to telephone demand. For such reasons, a drastic improvement in the telecommunication facilities must be carried out in line with the increase in international trade activities in Jakarta.

2.2.3 Economic Development Program

(1) In the 1st Five-Year Plan, Indonesia can be said to have been successful in not only increasing the GDP, raising productivity and stabilizing inflation but in cultivating

the will for development among the people. However, she cannot as yet be said to have overcome the problem of employment.

(2) According to President Soeharto's state address, the economic problem has the highest priority in the 2nd Five-Year Plan, the items of which are as under:

a) Stable supply of food, production of good quality clothing and raising the purchasing power of the people
b) Expansion of housing facilities
c) Better infrastructure
d) Generalized and better social welfare
e) More job opportunities

In order to attain the foregoing targets in the 2nd Five-Year Plan, President Soeharto in his address emphasized a better production control system, and that Gross National Product should be increased to about 7.5%. If the population should increase by 2.3% per annum, it will mean that the Gross National Product per capita will increase by 5.2% per year. Looking at it by sectors, this would require the increase of about 4.6% in agricultural production, 1.3% in industry, 9% in mining, 10% in communications and about 8% in the other sectors. Moreover, President Soeharto stated that it will be necessary to double the number of telephones from 225,000 sets to 403,000 sets by the end of the 2nd Five-Year Plan.

2.3 Telephone Utilization Situation and Demand Structure in Jakarta

2.3.1 Telephone Utilization Situation in Jakarta

There has been a remarkable increase in telephone demand in Jakarta in line with the economic growth. This has brought about the construction of eight telephone exchange offices since April 1960. In 1960, Kota and Tanjung-Priok Exchange Offices, in 1961 Kebayoran Exchange Office, in 1964 Gambir Exchange Office, in 1965 Jatinegara Exchange Office, in 1968 Semanggi Exchange Office, in 1969 Gandaria Exchange Office and in 1972 Slipi Exchange Office were established. As can be seen in Fig. 2.3.(1), Semanggi Exchange Office showed the highest telephone demand growth ratio in the past five years.

Unfortunately, accurate telephone demand in not only Indonesia but in Jakarta could not be obtained. It is assumed, however, that there are about 12,600 applicants on the waiting list in Jakarta. The telephone demand fulfilment rates (number of subscriber lines/ *1total telephone demand) of Jakarta and other principal cities in Indonesia are given in Fig. 2.3.(2). These rates may perhaps be not higher than those of the other cities in the world, though we cannot say defenitely due to the lack of basic data. As can be seen in Fig. 2.3.(3), the telephone diffusion rate (number of subscriber lines/population) is not satisfactory as compared with the capital cities of developing countries.

TABLE 2-2-(1) DISTRIBUTION OF MONTHLY INCOME & RECEIPT OF FAMILIES BY INCOME & RECEIPT GROUP

INCOME AND RECEIPT GROUP (RP)	NUMBER OF FAMILIES	SAMPLED (%)	REMAKS
(1)	(2)	(3)	
- 2,000	15	0.58	
2,001 - 2,500	39	1.50	
2,501 - 3,000	74	2.85	
3,001 - 3,500	111	4.27	
3,501 - 4,000	132	5.08	
4,001 - 4,500	181	6.97	
4,501 - 5,000	168	6.47	
5,001 - 5,500	157	6.04	
5,501 - 6,000	139	5.35	
6,001 - 6,500	138	5.31	
6,501 - 7,000	103	3.96	
7,001 - 7,500	126	4.85	
7,501 - 8,000	92	3.54	
8,001 - 9,000	163	6.27	
9,001 - 10,000	137	5.27	
10,001 - 12,500	263	10.12	
12,501 - 15,000	162	6.27	
15,001 - 17,500	97	3.73	
17,501 - 20,000	58	2.23	
20,001 - 25,000	89	3.42	
25,001 - 30,000	47	1.81	
30,001 - 35,000	37	1.42	
35,001 - 45,000	23	0.88	
45,001 - 55,000	20	0.77	
55,001 - 65,000	8	0.31	
65,001 - 75,000	5	0.19	
75,001 - 100,000	5	0.19	
100,001 AND OVER	9	0.35	
TOTAL / AVERAGE	2 598	100	

NOTE: INCLUDING NON- CONSUMPTION EXPENDITURE.

SOURCE: COST OF LIVING SURVEY. JAKARTS 1968- 1969
CENTRAL BUREAU OF STATISTICS.

TABLE 2-2-(2) LABOUR FORCES PROJECTION AT DKI JAKARTA (1971-1991)

(UNIT : THOUSANDS)

ASSUMPTION	SEX	1971	1976	1981	1986	1991	REMARKS
HIGH	MALE	1053	1349	1700	2127	2663	
	FEMALE	303	396	510	650	822	
	TOTAL	1356	1745	2210	2777	3485	
MEDIUM	MALE	1053	1349	1694	2109	2613	
	FEMALE	303	396	509	647	807	
	TOTAL	1356	1745	2203	2756	3420	
LOW	MALE	1053	1341	1675	2078	2572	
	FEMALE	303	390	496	624	773	
	TOTAL	1356	1731	2171	2702	3345	

SOURCE : CENTREL BUREAU OF STATISTICS.

TABLE 2-2-(3) TOTAL OF LABOUR FORCES AND PERCENTAGE BY ECONOMIC ACTIVITIES OF JAKARTA AND INDONESIA. (1971)

ACTIVITIES	TOTAL OF		% OF	
	JAKARTA	INDONESIA	JAKARTA	INDONESIA
AGRICULTURE	43,748	24,946,013	3.25	62.2
MINING	4,448	92,135	0.33	0.23
MANUFACTURING	120,512	2,952,617	8.97	7.36
ELECTRICLTY GAS AND WATER	7,613	38,332	0.57	0.10
CONSTRUCTION	92,075	750,128	6.85	1.87
TRADE	320,742	4,152,367	23.9	10.4
TRANSPORT AND COMMUNICATION	138,565	932,251	10.3	2.32
BANKING AND FINANCE	36,517	98,792	2.72	0.25
SERVICE	460,585	3,980,302	34.3	9.93
OTHERS	78,389	1,794,162	5.83	4.36
FIRST TIME LOOKING FOR WORK	41,032	407,971	3.05	1.02
TOTAL	1,344,226	40,100,070	100	100

NOTE : BASED ON POPULATION CENSUS 1971.
CENTRAL BUREAU OF STATISTICE.

TABLE 2-2-(4) DOMESTIC CAPITAL INVESTMENT (IN MILLION RUPIAH)
PERIOD, NOVEMBER 1968-DECENBER 1971

SECTOR OF ACTIVITY	INDONESIA		JAKARTA	
	NUMBER OF PROJECTS	INVESTMENT	NUMBER OF PROJECTS	INVESTMENT
AGRICUITURE	26	RP. 3,763	-	-
PLANTATION	79	26,079	-	-
FORESTRY	82	59,691	-	-
FISHERY	8	1,671	(12. 5%) 1	(22. 3%) RP. 372
CATTLE BREEDING	6	1,231	(50. 0%) 3	(22. 7%) 280
MINING	5	18,909	-	-
INDUSTRY	541	195,904	(42. 3%) 229	(34. 3%) 67, 216
TRANSPORTATION	36	25,206	(72. 2%) 26	(89.0%) 22,431
DWELLING HOUSE	2	1,536	(100 %) 2	(100%) 1,536
TOURISM	53	32,202	(58.5%) 31	(76.7%) 24,715
INFRASTRUCTURE	7	2,351	(28. 6%) 2	(7. 57%) 178
OTHERS	-	-	-	-
TOTAL	845	368,543	(34.8%) 294	(31. 7%) 116,728

SOURCE : DKI JAKATA ADMINISRATION

TABLE 2-2-(5) APPROVED FOREIGN INVESTMENT PROJECT
JAN. 1967- DEC. 1971

NO.	SECTOR OF ACTIVITY	INDONESIA		JAKARTA	
		NO OF PROJECTS	INVESTMENT US $	NO OF PROJECTS	INVESTMENT US $
1	BASIC AND HEAVY INDUSTRY	50	74,154,336	(62.0%) 31	(57.0%) 42,305,000
2	CHEMICAL INDUSTRY	14	85,458,000	(78.6%) 11	(27.5%) 23,539,000
3	ESTATE AGRICULTURE & RELATED BUSINESS	48	67,108,185	-	-
4	FISHERY	10	16,816,000	(10%) 1	(16.1%) 2,700,000
5	FORESTRY	57	397,261,111	-	-
6	HOTEL BUSINESS	7	54,890,000	(100%) 7	(100%) 54,890,000
7	INFRASTRUCTURE	16	9,481,076	(100%) 16	(100%) 9,841,076
8	LIGHT INDUSTRY & HANDICRAFT	123	119,282,222	(6.42%) 79	(73.4%) 87,566,731
9	MINING	15	540,657,000	-	-
10	PHARMACEUTICALS	33	39,701,000	(54.5%) 18	(54.2%) 21,522,186
11	REAL ESTATE CONSTRUCTION AND HOUSING	24	86,022,464	(87.5%) 21	(36.7%) 31,557,464
12	TEXTILE INDUASTRY	21	146,425,379	(57.1%) 12	(31.5%) 46,199,019
13	TRADE (INC. CRUMB RUBBER)	10	7,853,076	(10%) 1	(12.7%) 100,000
14	TRANSPORTATION COMMUNICATION	15	15,982,889	(73.3%) 11	(58.4%) 9,338,889
	TOTAL	443	1,661,092,738	(46.8%) 208	(19.8%) 329,559,765

SOURCE : DKI JAKARTA ADMINISTRATION.

TABLE 2-2-(6) DEMESTIC INVESTMENT BY SECTORS WHICH ARE CLOSELY RELATED TO TELEPHONE(PERIOD NOVEMBER 1968-DECEMBER 1971)

SECTOR OF ACTIVITY	INDONESIA		JAKARTA	
	NUMBER OF PROJECTS	INVESTMENT	NUMBER OF PROJECTS	INVESTMENT
INDUSTY	541	195,904	229	67,216
TRANSPORTATION	36	25,016	26	22,431
DWELLING HOUSE	2	1,536	2	1,536
TOURISM	53	32,202	31	24,715
INFRASTRUCTURE	7	2,351	2	178
OTHERS	-	-	-	-
TOTAL	639	257.199	(45.4%) 290	(45.1%) 116.076

TABLE 2-2-(7) FOREIGN INVESTMENT BY SECTORS WHICH ARE CLOSELY RELATED TO TELEPHONE(PERIOD JANUARY 1967-DECEMBER 1971)

SECTER OF ACTIVITY	INDONESIA		JAKARTA	
	NUMBER OF PROJECTS	INVESTMENT US $	NUMBER OF PROJECTS	INVESTMENT US $
BASIC & HEAVY INDUSTRY	50	74,154,336	31	42,305,000
CHEMICAL INDUSTRY	14	85,458,000	11	23,539,000
HOTEL BUSINESS	7	54,890,000	7	54,890,000
INFRASTRUCTURE	16	9,841,076	16	9,841,076
LIGHT INDUSTRY AND HANDICRAFT	123	119,282,222	79	87,566,731
PHARMACEUTICALS	33	39,701,000	18	21,522,186
REAL ESTATE CONSTRUCTION AND HOUSING	24	86,022,464	21	31,557,464
TEXTILE INDUSTRY	21	146,425,379	12	46,199,019
TRADE (INC. CRUMB.RUBBER)	10	7,853,076	7	100,000
TRANSPORTATION/ COMMUNICATION	15	15,982,889	11	9,338,889
TOTAL	313	639,610,442	66% 207	51% 326,859,365

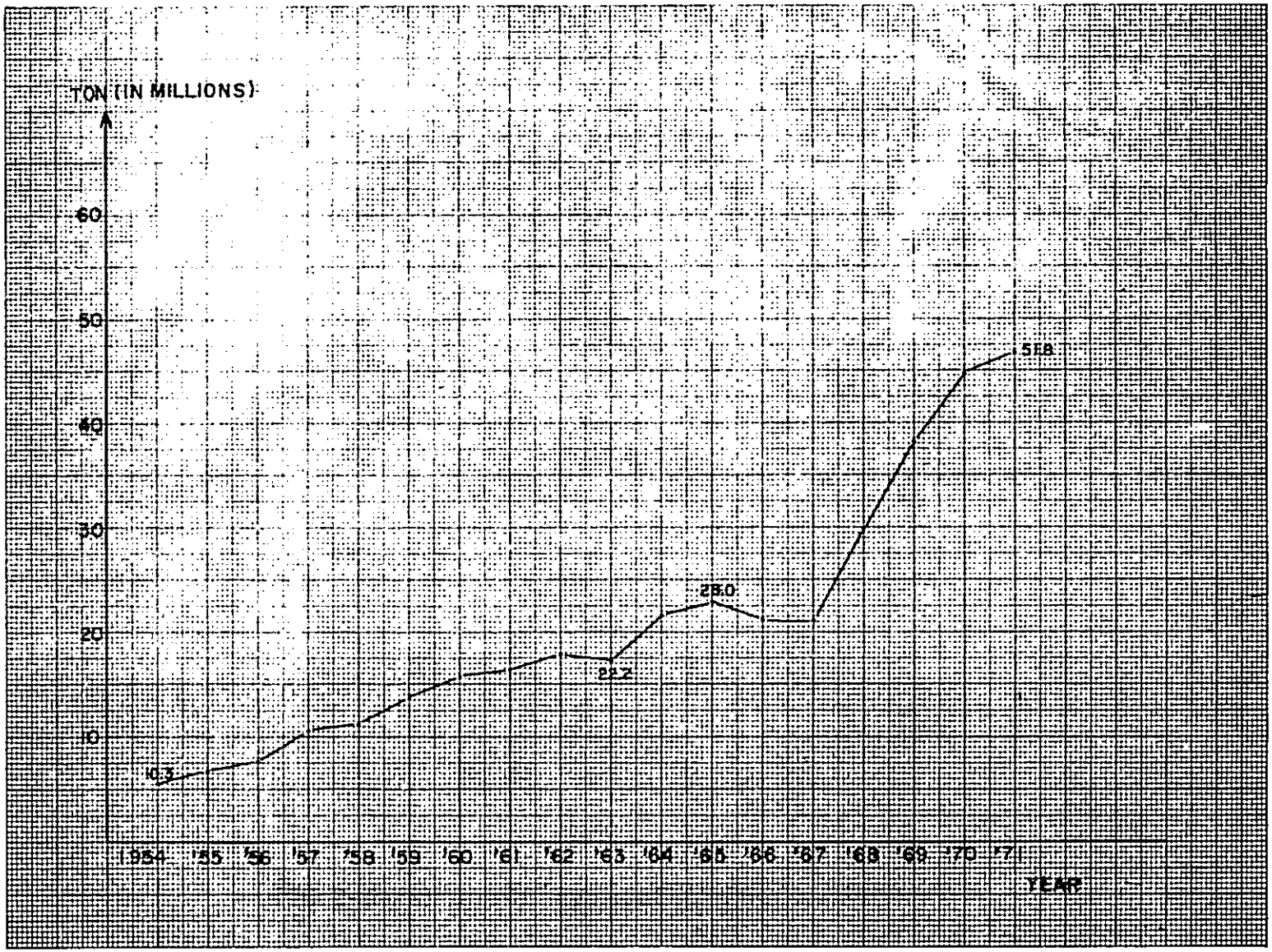


FIG. 2-2-(8) GRUDE PETROLEUM PRODUCTION

TABLE 2-2-(9) EXPORTS OF PETROLEUM AND PETROLEUM PRODUCTS

(IN GROSS WEIGHT = x10^{6} kg)

COUNTRY OF DESTINATION	1963	1964	1965	1966	1967	1968	1969	1970	1971
JAPAN	(52.5) 3,778.2	(74.9) 4,776.5	(70.6) 5,372.7	(66.7) 5,372.7	(89.3) 7,242.2	(133.0) 10,765.6	(212.4) 17,161.4	(314.1) 24,392.6	(344.1) 22,396.9
HONGKONG	(0.7) 17.1	(1.5) 47.4	(0.8) 48.4	(0.9) 48.4	(0.9) 17.3	(0.4) 8.4	(0.6) 62.0	(1.5) 124.0	(0.4) 7.6
SINGAPORE	(59.8) 2,845.4	(1.8) 69.4	(5.6) 1,191.3	(15.3) 1,191.3	(15.1) 1,174.8	(8.1) 614.8	(9.5) 690.5	(5.7) 410.8	(5.2) 446.9
PHILIPPINES	(13.8) 785.2	(23.4) 1,507.3	(16.7) 1,427.7	(19.6) 1,427.7	(21.4) 1,607.3	(23.1) 1,747.3	(24.8) 1,866.8	(25.0) 1,892.3	(25.3) 1,608.3
THAILAND	(8.7) 308.6	(5.4) 221.8	(1.5) 268.6	(2.5) 269.6	(2.8) 196.6	(1.7) 104.9	(1.0) 67.9	(0.1) 3.2	(0.1) 2.2
AUSTRALIA	(41.7) 2,453.1	(52.5) 3,301.3	(52.4) 3,790.2	(49.3) 3,790.2	(57.4) 4,650.2	(64.6) 5,004.1	(57.9) 4,480.9	(31.0) 2,740.1	(6.2) 422.9
NEW ZEALAND	(3.5) 107.3	(1.6) 48.7	(0.5) 84.3	(2.1) 84.3	(1.2) 58.8	(0.8) 37.4	(0.7) 33.5	(0.0) 0.8	- -
HAWAI	(3.0) 185.9	(4.7) 309.1	(5.8) 307.5	(4.0) 307.5	(10.6) 825.8	(4.4) 337.5	(4.7) 354.2	(3.4) 259.2	(7.7) 444.8
U.S.A.	(29.5) 1,923.5	(39.8) 2,551.5	(36.7) 1,578.5	(21.5) 1,578.5	(28.2) 1,999.9	(50.7) 3,555.9	(56.2) 4,013.9	(57.3) 3,985.0	(78.0) 4,656.0
UNITED KINGDOM	(9.9) 633.7	(1.4) 104.6	(0.4) 27.7	(0.4) 27.7	(0.5) 37.8	(0.7) 55.9	(1.7) 132.1	(0.2) 13.0	(0.2) 20.0
NATHERLANDS	(0.7) 47.4	(10.8) 730.7	(9.5) 1,516.9	(15.7) 1,516.9	(7.0) 770.8	(2.0) 181.2	(1.6) 147.5	(1.0) 68.2	(0.0) 0.6
OTHERS	(44.9) 2,132.1	(48.8) 2,887.7	(71.5) 278.2	(5.4) 278.2	(5.2) 315.5	(8.0) 453.5	(8.9) 647.5	(7.0) 312.7	(79.8) 5,977.7
TOTAL	(268.7) 15,217.5	(2,666.6) 16,556.0	(272.0) 17,524.4	(203.4) 15,892.0	(239.6) 18,897.0	(297.5) 22,865.5	(380.0) 29,564.2	(446.3) 34,201.9	(547.0) 35,981.9

SOURCE : CENTRAL BUREAU OF STATISTICS 1971 ( ) : VALUE US $ MILLION

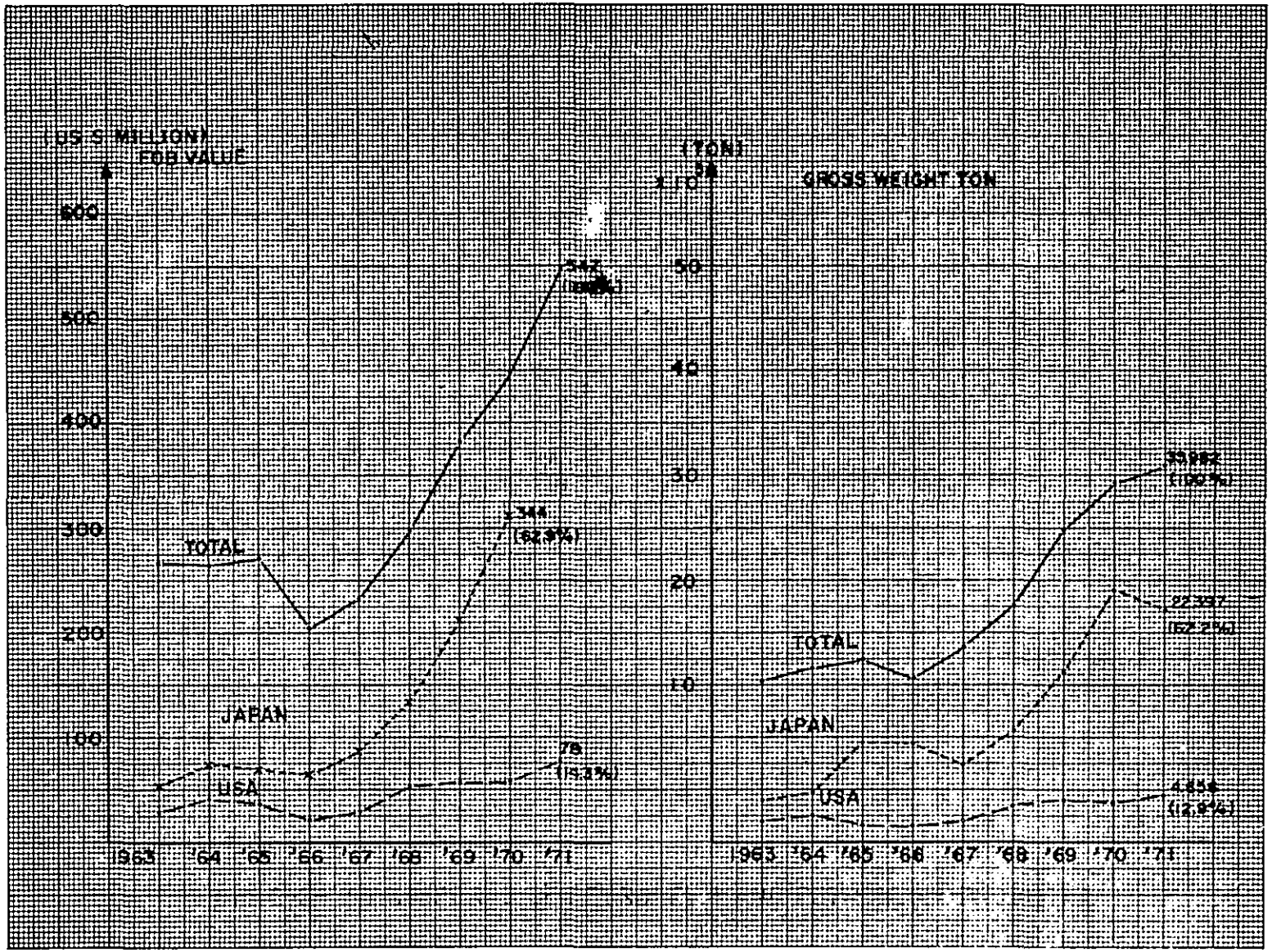


FIG. 2-2-(10) EXPORTS OF PETROLEUM AND PETROLEUM PRODUCTS

TABLE 2-2-(11) EXPORTS OF GROUP A, B, AND OIL 1963-1971.

(GROSS WEIGHT : x 1,000,000KG)

PRODUCT YEARS	RUBBER	COPRA	COFFEE	PAIM-OIL	TIN-ORE	OTHERS	TEA	WOOD	OTHERS	PET. AND PET PRODUCTS	TOTAL EXPORTS
1963	(246.3) 581.1	(13.6) 108.4	(19.8) 83.9	(20.0) 109.8	(18.9) 21.4	(36.3) 72.1	(17.8) 31.6	(1.5) 87.4	(33.0) 1,267.8	(268.7) 15,217.5	(697.9) 17,581.0
1964	(235.8) 659.1	(24.3) 175.5	(26.6) 62.4	(26.9) 133.2	(31.6) 19.7	(38.3) 75.7	(17.0) 36.0	(1.8) 69.8	(55.3) 1,010.8	(266.6) 16,556.0	(724.2) 18,798.2
1965	(222.0) 780.5	(18.0) 123.6	(23.2) 108.4	(27.3) 125.9	(37.9) 19.3	(31.9) 58.6	(16.9) 36.5	(2.1) 137.5	(56.4) 1,038.3	(272.0) 17,524.4	(707.7) 19,881.2
1966	(223.3) 679.9	(15.1) 119.4	(32.7) 98.5	(33.4) 177.1	(30.7) 12.1	(41.1) 65.3	(17.2) 37.4	(3.6) 203.5	(78.2) 1,006.4	(203.4) 15,892.0	(678.7) 18,291.2
1967	(168.6) 651.6	(13.6) 113.9	(43.8) 133.1	(23.6) 133.3	(48.8) 21.3	(36.8) 86.6	(9.6) 19.6	(6.3) 400.9	(74.7) 1,166.2	(239.6) 18,897.0	(665.4) 21,633.5
1968	(176.5) 770.9	(35.2) 217.0	(44.4) 84.7	(19.5) 152.4	(26.5) 31.7	(31.7) 70.4	(17.4) 40.2	(11.5) 882.8	(70.3) 1,289.5	(297.5) 22,866.5	(730.7) 26,406.1
1969	(225.8) 855.8	(18.5) 157.0	(59.7) 127.1	(24.0) 179.1	(24.9) 27.0	(20.6) 65.2	(8.0) 36.1	(28.6) 2,689.7	(71.4) 1,528.2	(382.9) 29,603.0	(853.7) 35,268.2
1970	(243.4) 790.2	(30.3) 185.1	(69.2) 104.3	(35.1) 159.2	(106.1) 54.6	(12.8) 56.0	(18.3) 41.1	(104.3) 5,772.5	(84.8) 2,749.4	(446.3) 34,201.9	(1,160.6) 44,114.3
1971	(221.9) 789.3	(12.4) 77.5	(55.3) 74.3	(44.7) 209.0	(41.9) 15.0	(45.2) 91.2	(28.9) 44.8	(161.4) 7,684.3	(134.0) 4021.7	(477.9) 36,606.6	(1223.6) 43,693.7

SOURCES: STATISTICAL POCKETBOOK OF INDONESIA. 1970/1971.

NOTE: - UPPER SIDE FIGURE = FOB VALUE : IN US $ MILLIONS
- DOWN SIDE FIGURE = GROSS WEIGH: IN MILLION KILOS.

TABLE 2-2-(12) IMPORTS BY ECONOMIC GROUPS
1963-1971

(GROSS WEIGH : X 1.000.000 KG)

ITEMS / YEARS	CONSUMPTION GOODS	RAW MATERIALS AND AUXILIARY GOODS	CAPITAL GOODS	TOTAL IMPORT
1963	(178.2) 645.9	(185.4) 2,518.1	(157.8) 134.2	(521.4) 3,298.2
1964	(276.9) 1,716.8	(173.9) 902.7	(229.1) 172.9	(679.9) 1,792.4
1965	(230.8) 895.6	(243.0) 1,179.4	(220.9) 151.3	(694.7) 2,266.3
1966	(224.7) 496.3	(180.3) 773.9	(121.7) 149.4	(526.7) 1,419.6
1967	(232.5) 454.9	(237.7) 1,072.0	(179.0) 149.3	(649.2) 1,676.2
1968	(266.5) 1,323.9	(259.7) 1,399.8	(189.6) 153.6	(715.8) 2,877.3
1969	(220.9) 1,166.5	(320.8) 1,968.9	(238.8) 219.9	(780.7) 3,355.3
1970	(251.1) 1,090.6	(376.5) 2,289.6	(373.9) 334.6	(1001.5) 3,714.8
1971	(221.2) 867.7	(454.5) 3,199.2	(498.2) 413.7	(1173.9) 4,480.8

SOURCES : STATISTICAL POCKETBOOK OF INDONESIA
( ) : CIF VALUE: US $ MILLION
-DOWN SIDE FIGURE : GROSS WEIGHT: IN MILLION

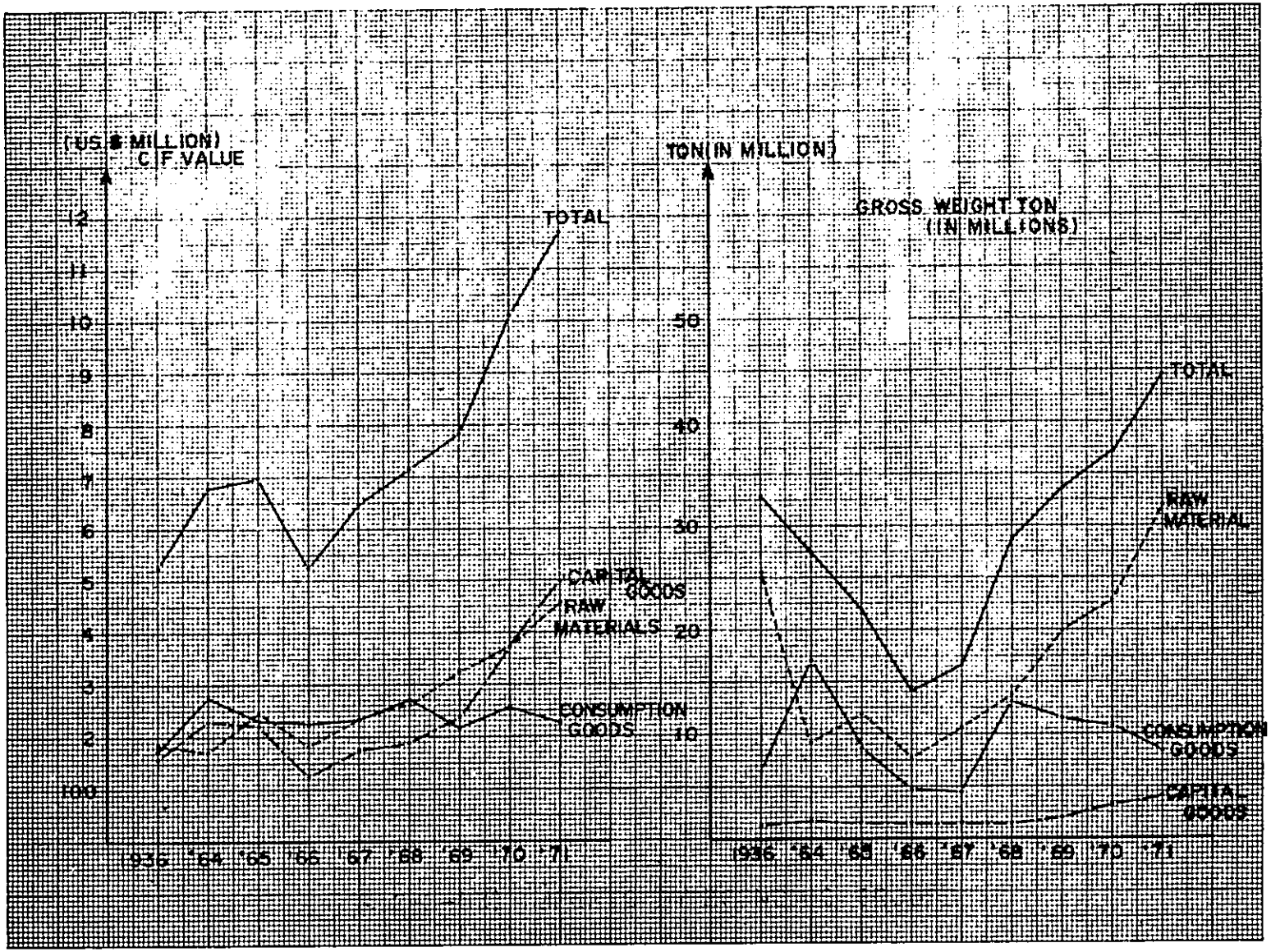


FIG. 2-2-(13) IMPORTS BY ECONOMIC GROUPS

Although the exchange office establishment plan is based on the telephone demand forecast for the office service areas concerned, the forecasted demand will sometimes turn out to be different from the actual demand, owing to unexpected changes in city planning or social environment. Consequently, the telephone demand within the service area of a newly established office must be statistically analyzed, and the data obtained must be utilized for better facility management and demand forecast in the future.

Due to the large increase of new applicants for telephones since 1971, the waiting list of applicants reached 12,600 up to 1973. Because of the shortage in telephone facilities and funds, there may be a great number who have given up the idea of submitting applications for telephones and attention must be given to this *1potential demand.

As seen in Fig. 2.4.(6), the rate of need for telephones is higher for business offices or shops than for residences on a short-term basis.

According to the personal interview survey results in the residential area, the potential demand in the R-2 area pattern is the highest since many residents in this area do not have telephones in spite of their comparatively high income and answered "We need telephones."

Since Jakarta City will further develop as the commercial and political center of Indonesia, in the central town area, the night population will decrease and the day population will increase in the same manner as in the big cities in the world.

In forecasting the telephone demand within the future office service areas, it goes without saying that the future population forecast for Jakarta is very important.

The population density plan obtained from the Jakarta City authorities will be revised in the future because it is based on the population of 6.5 million people in 1985 at the projection point of 1966 and it is believed not reasonable from the present situation.

It is quite difficult for the members of the survey team to forecast the population density in each area which will be strongly influenced by Government policy. However, taking into consideration the tendency of increase in the present population density and the aforementioned population density of Paris with 240 people per hectare, we decided to use the figure of 13.8 million as the population projection for 1993.

2.3.2 Telephone Demand Structure in Jakarta

According to the data made available by PERUMTEL, the telephone demand in Jakarta is 51,900 at the end of 1973 and will show a large increase in the future.

In forecasting telephone demand, it is also necessary to analyze the telephone demand structure. Our demand structure study was made by dividing the demand into two groups, namely, the residential telephone and the business telephone groups. As seen in Fig. 2.3.(5), the structure ratio for residential telephone is generally low in the initial stage of telephone propagation.

Now that the national income has increased with the progress in information oriented society and development of the community, it is not too much to say that the people cannot live in the present day affluent society without having new information. The effectiveness of the telephone has increased rapidly and has become one of the necessities of life. For this reason, the telephone structure ratio for residential telephones is higher than that for business telephones. The demand structure ratio for residential telephones in Jakarta is 43% and, as seen in Table 2.3.(8), is very high in comparison with the telephone diffusion in Japan in the initial stage. This is due to the following reasons:

(1) There are a large number of intellectuals who have lived in developed countries.

(2) There are many small enterprises which do not have telephones.

(3) Others.

On the other hand, in observing the application list, the telephone ratio for business telephones is about 51% and is somewhat lower than the structure ratio for existing subscriber lines. This demand structure ratio for residential and business telephones is very important in preparing a long-term plan including the tariff system. This is becuase of the large difference in telephone income between the residential and business telephones. Residential telephones will probably further increase in the future. In forecasting telephone demand, it is desirable that PERUMTEL manage the systematic compiling of data as soon as possible.

2.3.3 *Differences in Telephone Revenue between Business and Residential Telephones*

According to the random sampling survey of the existing subscriber lines in Jakarta, the telephone revenue per telephone for business use is approximately 20,000 Rupiahs, and for residential use approximately 5,600 Rupiahs. The charge for business telephone is about 3.6 times that for residential telephones.

Consequently, in order to improve the investment efficiency it may be necessary to determine the order of priority in installation of telephones. In order to raise the investment results in the telecommunications field and promote the economic development of the country, it would be effective to give priority to telephones for business use. Furthermore, when preparing the long-term expansion plan, consideration must be made of the difference in revenue per telephone for business use and residential use and that telephones for residential use will increase even in the future.

2.3.4 Distribution of Telephone Revenue by Kind of Call

The very high telephone revenue per subscriber is because of the high percentage of international calls which comprise about 33% of the total telephone revenue. (Refer to Fig. 2.3.(6).)

Although this international call ratio is very high in comparison with those in other countries, it is presumed that it will decrease in the future. (Refer to Fig. 2.3.(7).)

The reasons for the present high ratio for international calls is due to the increase in trade volume and the entry of foreign enterprises into the country. This is also clear from the fact that out of the telephone subscribers, those employed in foreign companies comprise a high ratio of 11% of the total subscribers.

In line with economic development and the increase in telephone demand of the Indonesians, it is believed that the ratio for international calls will gradually decrease in the future while that for domestic calls will increase.

2.3.5 Distribution of Waiting Periods for Telephones

It is usual that when the waiting period for installation of telephone is long, there is not much increase in the application for telephone installation but when installation is possible, the applications will increase rapidly. Consequently, when forecasting the telephone demand, the foregoing potential demand must be taken into full consideration. Since it is very difficult to forecast the telephone demand, full application of the *2telephone demand management control system must be made and the expansion plan be timely revised in accordance with the changes in demand. By implementation of this telephone demand management control system, accurate demand forecasts, reduction in telephone facilities and the avoidance of excessive investment will be possible.

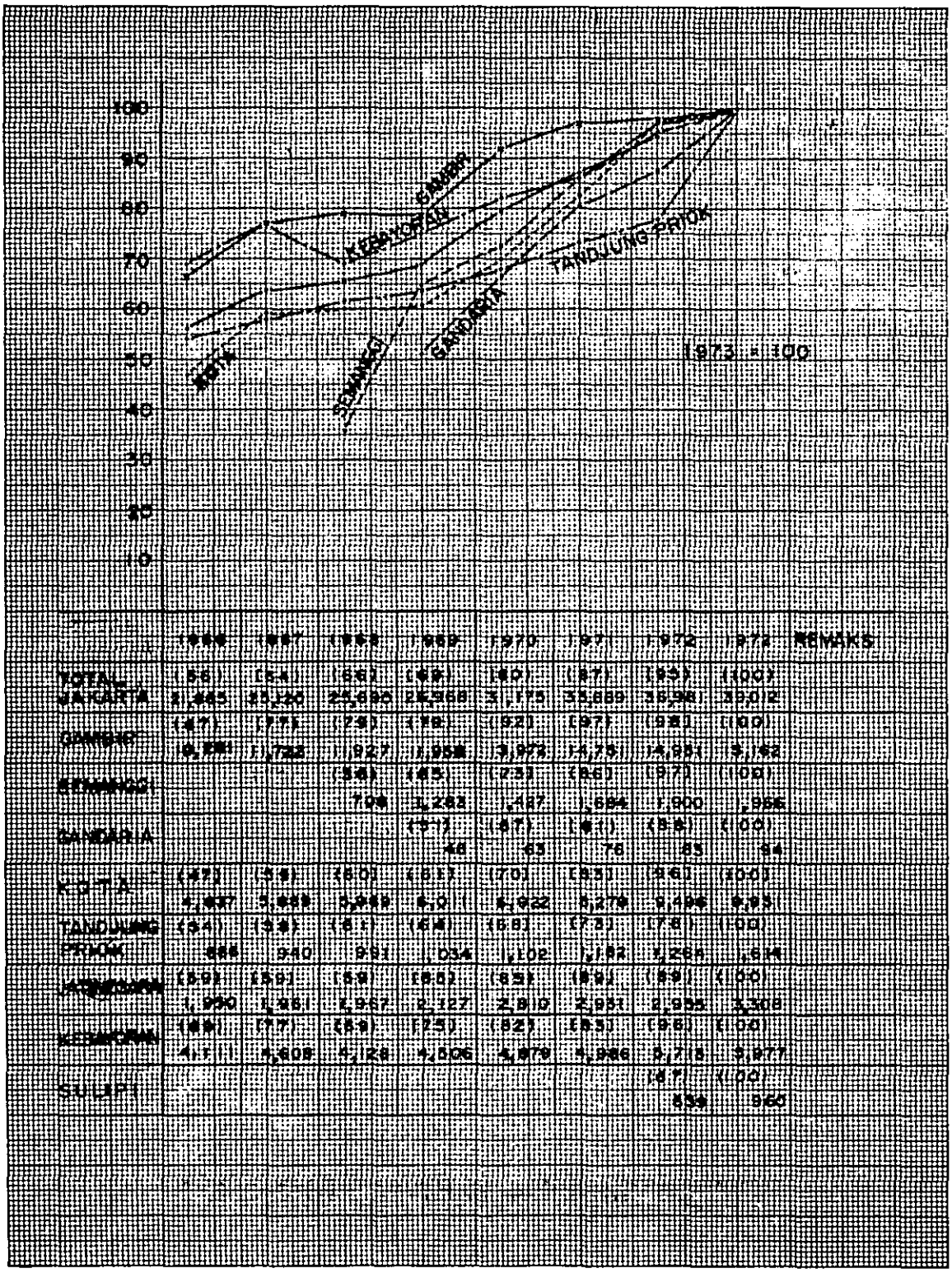
In the initial stage of telephone propagation, it will be difficult to expand the facilities in all the areas due to the limitation in funds. As the result, it may become necessary to establish different waiting periods for installation of telephones in each exchange office as shown in Table 2.3.(10). Therefore, it is important that PERUMTEL give priority to business telephones in the expansion stage and gradually shorten the waiting periods for telephone installation in the future.

* 1 Total demand = actual demand + potential demand
  Actual demand = number of subscriber lines + waiting applicants
  Potential demand = Those who require telephones and have the economic ability but do not submit applications to the telephone office.
* 2 Telephone demand management control system (Refer to Paragraph 12.3.)

2.4 Result of Interview Survey by Questionnaire on Telephones

The most important thing in forecasting telephone demand is compiling basic data such as for population, number of households, number of employees, number of business offices, etc.

No matter how excellent the forecasting method may be, if incomplete basic data were utilized, this would worsen the degree of accuracy of the forecast with the resultant effect



	1966	1967	1968	1969	1970	1971	1972	1973	REMARKS
TOTAL JAKARTA	(.56) 2,445	(5.4) 25,220	(6.6) 25,690	(6.6) 25,368	(8.0) 31,175	(8.7) 35,889	(9.3) 36,98[illegible]	(100) 39,012	
GAMBIR	(4.7) 0,[illegible]	(9.1) 1,722	(2.8) 1,927	(3.6) 1,958	(5.2) 3,973	(8.7) 4,75[illegible]	(9.8) 4,991	(100) 5,182	
SEMARANG			(5.8) 709	(4.5) 1,242	(2.3) 1,487	(8.6) 1,694	(9.7) 1,900	(100) 1,956	
SURABAYA				(5.1) 46	(8.7) 63	(8.1) 76	(8.8) 85	(100) 94	
KOTA	(4.7) 4,[illegible]	(5.8) 3,[illegible]	(6.0) 3,[illegible]	(6.1) 4,0[illegible]	(7.0) 4,922	(8.5) 5,279	(9.6) 5,496	(100) 5,[illegible]	
TANDJUNG PRIOK	(5.4) 888	(8.8) 940	(8.1) 991	(6.8) 1,034	(6.8) 1,102	(7.5) 1,192	(7.8) 1,268	(100) 1,614	
JAKARTA	(5.9) 1,990	(5.9) 1,96[illegible]	(6.9) 2,967	(8.6) 2,127	(8.5) 2,810	(8.9) 2,931	(8.9) 2,955	(100) 3,308	
KEBAYORAN	(8.9) 4,1[illegible]	(7.7) 4,608	(8.9) 5,128	(7.5) 4,506	(8.2) 4,879	(8.5) 4,986	(9.6) 5,718	(100) 5,977	
SURABAYA							(8.7) 839	(100) 960	

FIG. 2-3-(1) GROWTH OF SUBSCRIBER LINE

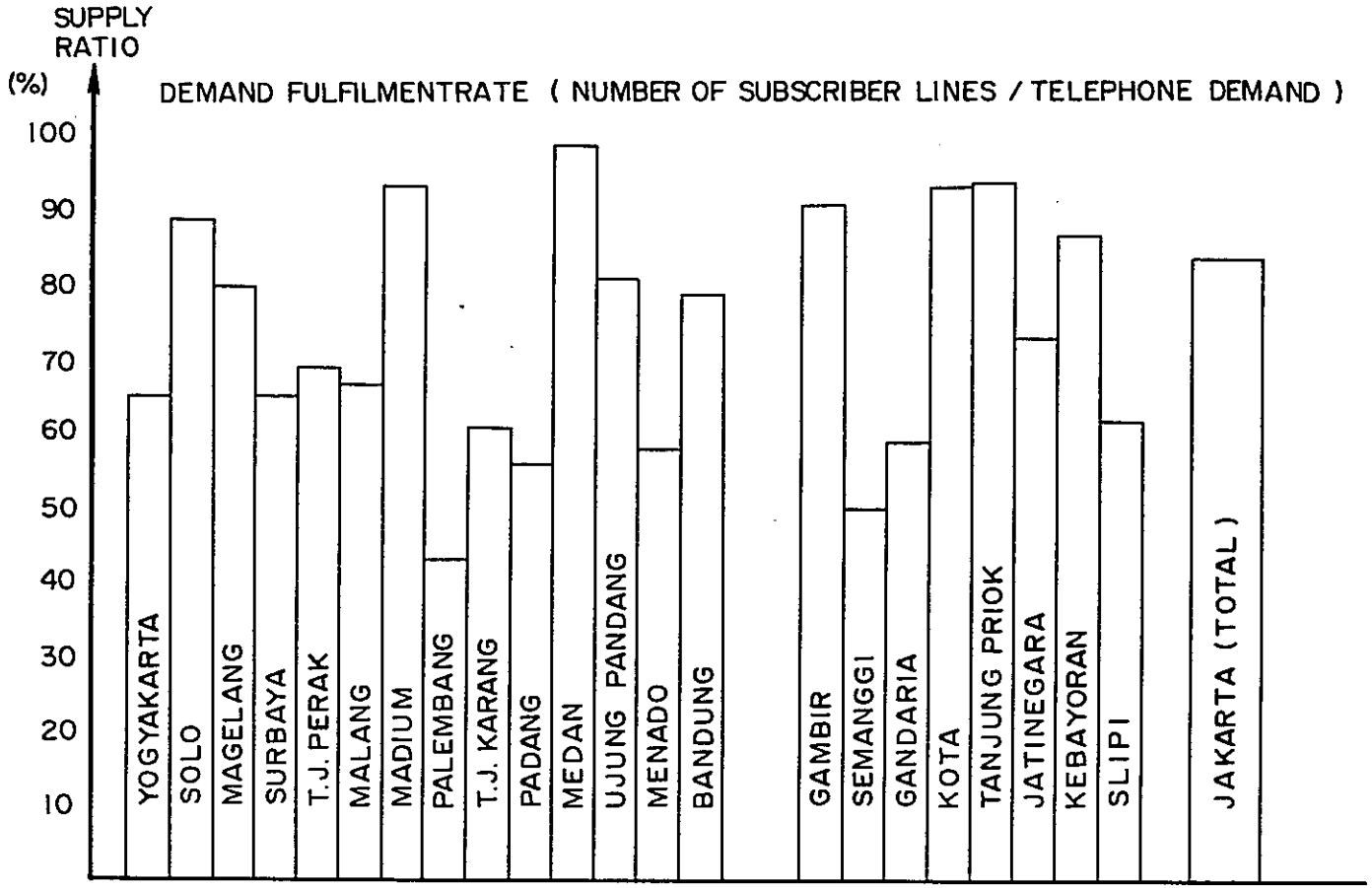


FIG. 2-3-(2) COMPARISON OF DEMAND FULFILMENT RATE OF BIG CITIES IN INDONESIA

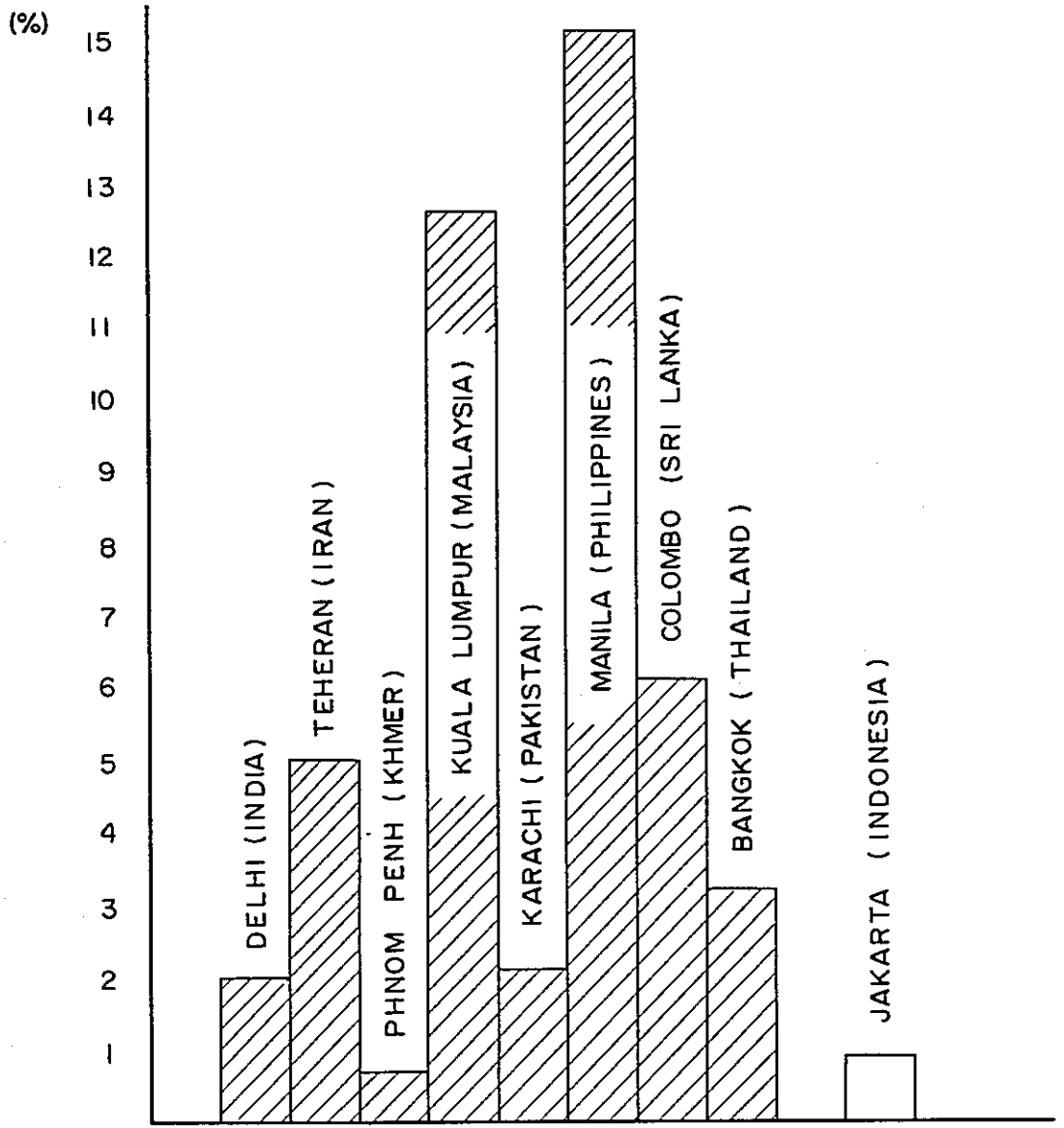


FIG. 2-3-(3) INTERNATIONAL COMPARISION OF TELEPHONE DIFFUSSION RATE OF LARGE CITIES

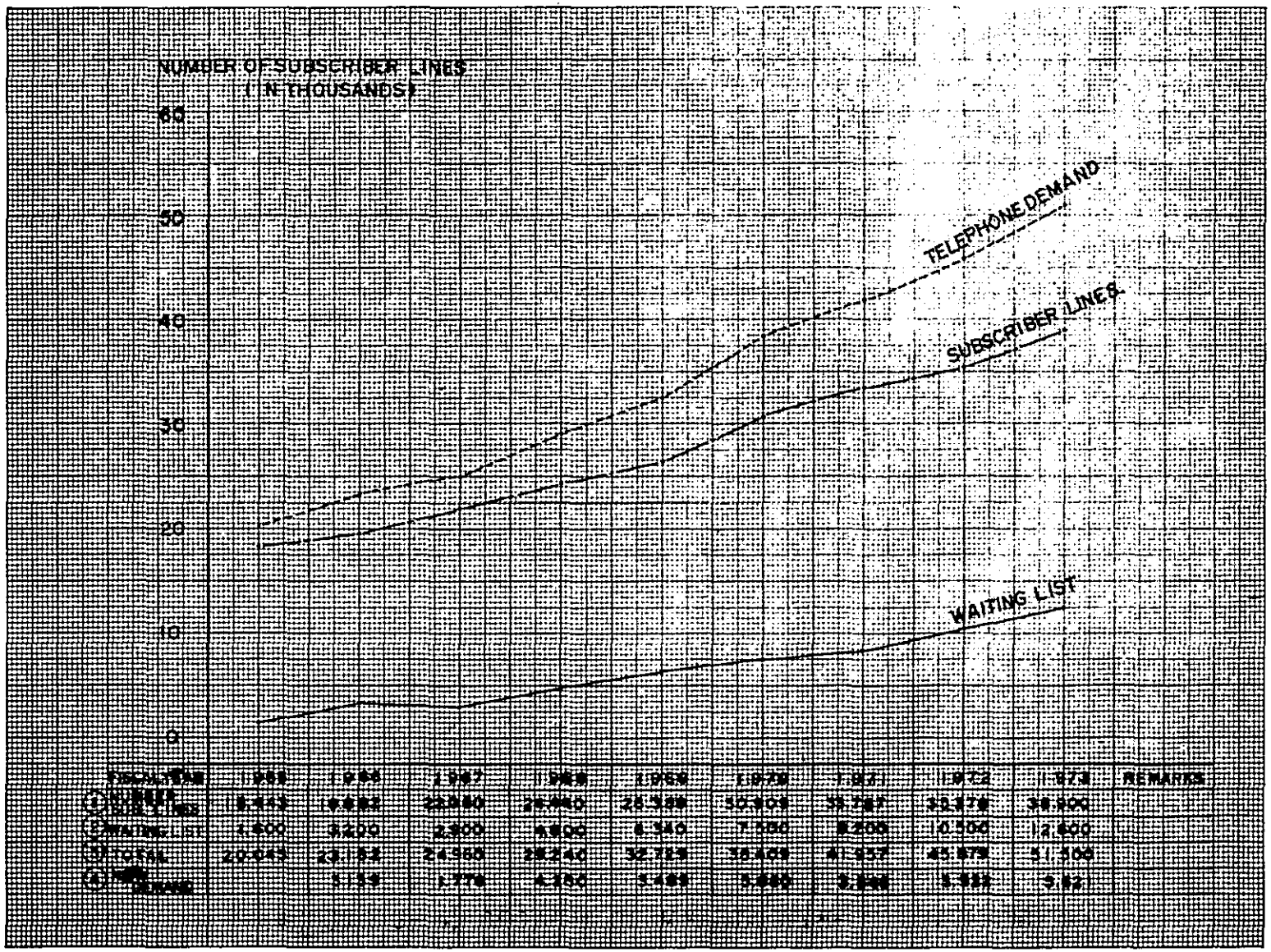


FIG. 2-3-(4) GROWTH OF JAKARTA TELEPHONE DEMAND

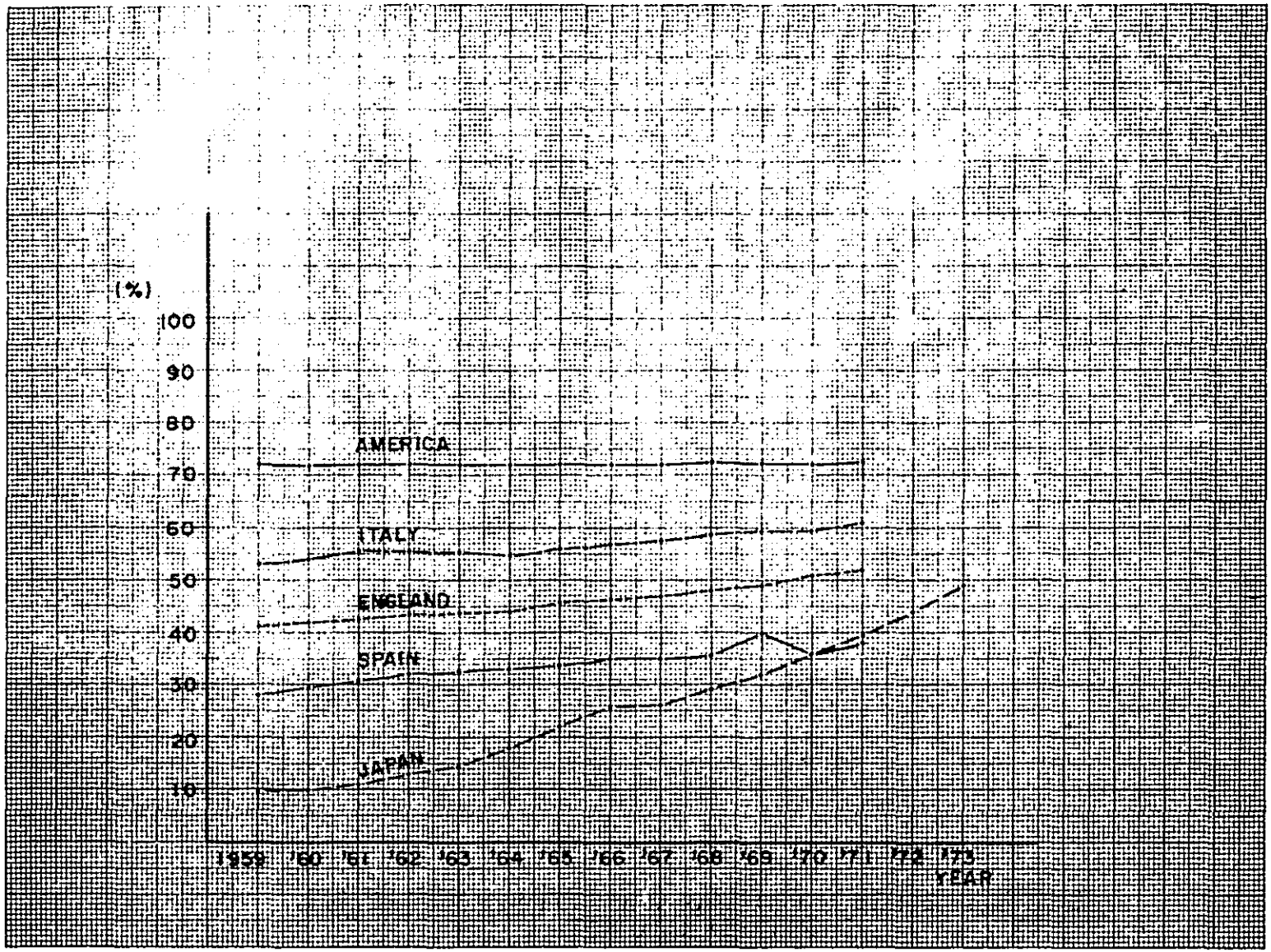
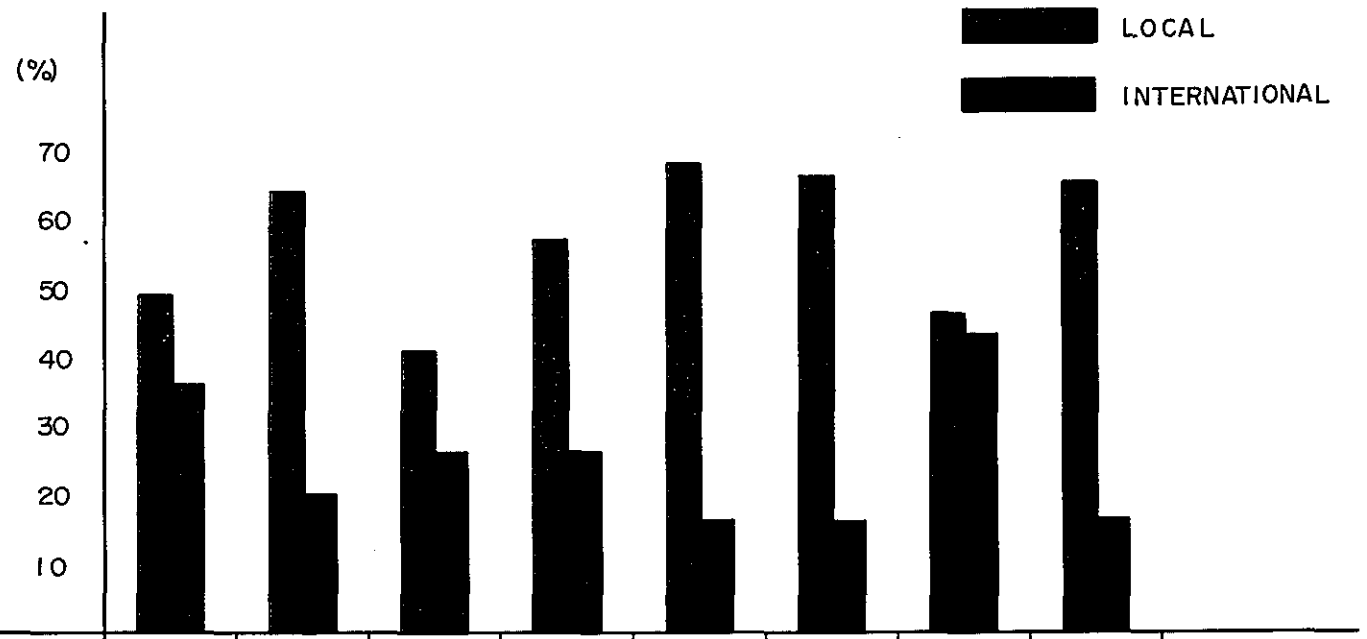


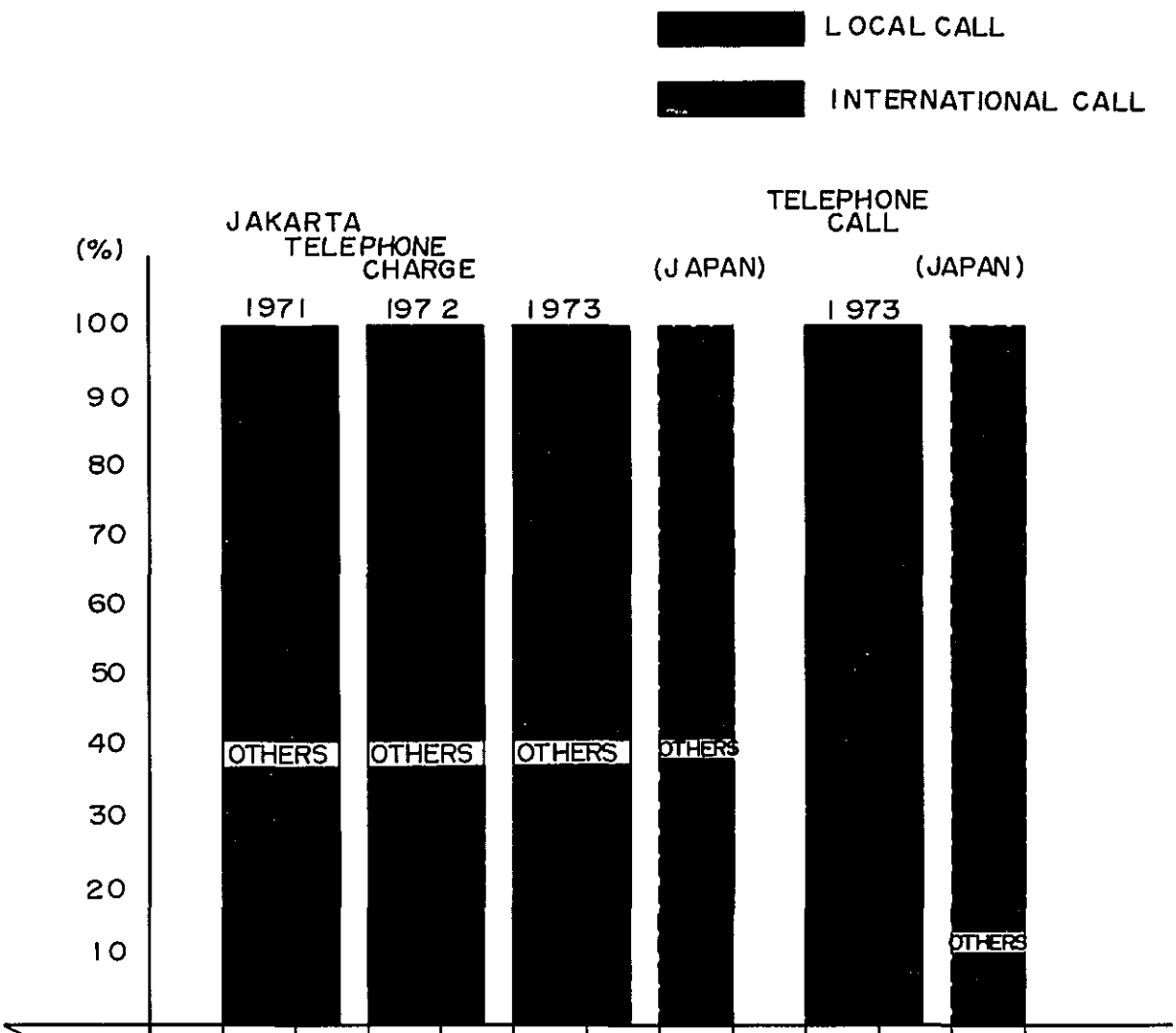
FIG. 2-3-(5) COMPOSITION RATE OF RESIDENCE TELEPHONE TO TOTAL TELEPHONE



EXCHANGE	GAMBIR	SEMANGGI	GANDARIA	KOTA	TANDJUNG PRIOK	JANTINE-GARA	KEBA-YORAN	SLIPI	TOTAL (JAKARTA)
TELEHONE RENTAL	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
LOCAL CALL	(49.5)	(64.7)	(41.3)	(57.9)	(68.8)	(65.1)	(45.0)	(64.9)	(52.3)
INTER-LOCAL COLL	(9.0)	(9.4)	(3.8)	(11.2)	(6.1)	(11.7)	(6.8)	(14.0)	(9.6)
INTER-NATIONAL CALL	(36.5)	(19.0)	(26.5)	(25.8)	(15.2)	(16.3)	(42.8)	(15.6)	(33.1)
ADMINIST RATION	(0.3)	(0.7)	(0.3)	(0.5)	(0.8)	(0.5)	(0.5)	(0.5)	(0.3)
BASIC	(4.7)	(6.2)	(28.1)	(4.6)	(9.1)	(64)	(4.9)	(5.0)	(4.3)

FIG. 2-3-(6) % DISTRIBUTION OF TELEPHONE CHARGE BY KIND OF CALL

※ TELEPHONE RENTAL
= LOCAL CALL + INTERNATIONAL COLL
+ ADMINISTRATION + BASIC



MONTH	4	5	6	7	8	9	10	11	12	1	2	3	TOTAL
BASIC COST				7.1 5.7 4.6	7.2 5.4 4.4	6.6 5.4 4.4	6.4 5.5 4.3	6.4 5.3 4.6	6.1 5.6 4.6	7.4 5.0	6.3 5.3	6.3 5.2	5.5
LOCAL	49.6 52.8	50.8 53.2	51.7 52.2	52.2 38.6 52.2	52.5 51.8 51.5	53.1 53.1 53.0	51.5 53.2 52.3	50.6 53.7 52.3	49.9 52.6 51.5	49.4 52.7	49.7 53.1	49.8 52.5	52.4
INTER LOCAL	11.9 9.0	11.6 9.3	10.5 8.8	14.3 10.8 9.0	13.9 10.6 9.4	13.7 10.5 9.4	13.4 10.3 9.6	13.0 9.4 9.5	12.2 8.9 9.3	12.5 9.3	12.8 9.0	12.2 9.4	10.1
INTERNATIONAL	31.4 32.1	31.3 32.0	31.4 32.5	25.6 30.9 33.7	25.6 31.5 34.1	25.4 30.4 32.7	28.0 30.4 33.1	29.4 30.7 33.0	30.7 32.2 33.9	30.1 32.3	30.4 32.0	31.0 32.0	31.4
ADMINISTRATION	0.6 0.4	0.5 0.4	0.5 0.4	0.6 0.5 0.4	0.6 0.4 0.3	0.6 0.4 0.3	0.5 0.4 0.3	0.5 0.4 0.4	0.5 0.3 0.4	0.6 0.4	0.5 0.4	0.5 0.4	0.4
TOTAL	% 100	% 100	% 100	% 100	% 100	% 100	% 100	% 100	% 100	% 100	% 100	% 100	

UPPER : 1971
MIDDLE : 1972
DOWN : 1973

FIG. 2-3-(7) % DISTRIBUTION OF TELEPHONE CHARGE BY KIND OF CALL MONTH (FROM 1971 TO 1973)

TABLE 2-3-(8) EXISTING SITUATION

NAME-OF EXCHANGE	NUMBER OF SUBSCRI-BER LINE	EXISTING SUBSCRIBERS			WAITING LIST			NEW OR ADDITIONAL SUBCRIBER LINE			FOREIG NERS	RESI-DENTIAL CHERGE	RE-MARKS
		BUSI-NESS	RESI-DENTIAL	TOTAL	BUSI-NESS	RESI-DENTIAL	TOTAL	NEW	ADDI TIONAL	TOTAL			
GAMBIR	14.685	(55%) 64	(45%) 52	(100%) 116	(48%) 121	(52%) 132	(100%) 253	(70%)	(30%)	(100%)	(15%)	6.500	
SEMANGGI	1.920	(30%) 18	(70%) 42%	(100%) 60	(62%) 165	(38%) 102	(100%) 267				(11%)	5.000	
GANDARIA	91	(98%) 59	(2%) 1	(100%) 60	(86%) 36	(14%) 6	(100%) 42	(52%)	(48%)	(100%)	(0)		
KOTA	9.728	(72%) 53	(28%) 21	(100%) 74	(55%) 150	(45%) 121	(100%) 271				(27%)	3.800	
TANJUNG PRIOK	1.344	(58%) 35	(42%) 25	(100%) 60	(94%) 15	(6%) 1	(100%) 16				(12%)	1.900	
JATINEGA-RA	2.977	(60%) 36	(40%) 24	(100%) 60	(64%) 135	(36%) 75	(100%) 210	(64%)	(35%)	(100%)	(21%)	6.700	
KEBAYORAN BARU	5.873	(41%) 24	(59%) 35	(100%) 59	(32%) 82	(68%) 174	(100%) 256				(30%)	5.800	
SLIPI	837	(75%) 45	(25%) 15	(100%) 60	(34%) 54	(66%) 107	(100%) 161				(9%)	7.400	
TOTAL	37.455	(57%)	(43%)	(100%)	(51%)	(49%)	(100%)						

MARCH OF 1973

TABLE 2-3-(9) TELEPHONE CHARGE BY TELEPHONE EXCHANGE OFFICE

(Data : 1974)

NAME OF EXCHAGE	TELEPHONE CHARGE /SUB		CHARGE PER SUB.	MORE THAN RP. 50,000	REMAKS
	BUSINESS	RESIDENTIAL			
GAMBIR	22,000	6,500	15,600	5 %	
SEMANGGI	13,200	5,000	7,400	7 %	
GANDARIA	22,000		16,900	2 %	
K O TA	14,900	3,800	9,900	7 %	
TANJUNG PRIOK	7,700	1,900	6,100	2 %	
JATINEGA-RA	18,200	6,700	9,400	6 %	
KEBAYORAN	34,500	5,800	9,800	11 %	
SLIPI	19,500	7,400	9,000	7 %	
JAKARTA	22,000	5,600	11,800		

TELEPHONE CHARGE : RP. PER SUBSCRIBER
BUSINESS : BUSINESS TELEPHONE
RESIDENTIAL : RESIDENTIAL TELEPHONE
MORE THAN RP. 50,000: PERCENTAGE OF NUMBER OF SUBSCRIBER PAID TELEPHONE CHARGE MORE THAN RP. 50,000.

TABLE 2-3-(10) WAITING PERIOD

EXCHANGE NAME		month 0 - 0.5	-1.0	-1.5	-2.0	03.0	-0.40	-5.0	-6.0	REMARKS
GAMBIR	①	15.3%	36.3	53.2	66.9	87.9	100%	-	-	
	②	8.2	28.1	43.9	56.2	81.5	100	-	-	
	③	11.5	31.9	48.2	61.2	84.5	100	-	-	
SEMANGGI	①	19.9	32.6	51.3	68.2	86.3	100	-	-	
	②	6.9	20.6	40.2	56.9	73.5	100	-	-	
	③	14.9	28.0	47.0	63.8	81.3	100	-	-	
GANDARIA	①	8.3	38.9	55.5	72.2	100	-	-	-	
	②	-	33.0	33.0	83.0	100	-	-	-	
	③	7.1	38.0	52.3	73.7	100	-	-	-	
KOTA	①	22.8	38.3	42.3	64.4	79.9	89.3	96.0	100	
	②	18.0	36.1	39.3	64.4	89.3	97.5	-	100	
	③	20.7	37.3	41.0	65.3	84.1	98.0	96.7	100	
TENJUNG PRIOK	①	-	13.3	46.7	60.0	73.3	100	-	-	
	②	-	-	100	-	-	-	-	-	
	③	-	12.5	50	62.5	75.0	100	-	-	
JATINEGARA	①	17.8	45.2	69.6	100	-	-	-	-	
	②	40	84.0	93.3	100	-	-	-	-	
	③	25.7	59.0	78.1	100	-	-	-	-	
KEBAYERAN	①	7.3	43.9	57.3	100	-	-	-	-	
	②	21.2	67.1	76.9	100	-	-	-	-	
	③	16.8	59.7	70.6	100	-	-	-	-	
SLIPI	①	1.9	9.3	22.3	44.5	88.9	100	-	-	
	②	5.6	12.1	26.2	43.0	84.1	100	-	-	
	③	4.3	11.2	24.8	43.5	85.7	100	-	-	

① BUSINESS TELEPHONE
② RESIDENTIAL TELEPHONE
③ TOTAL

of excessive or under investment in the facilities. In order to design the facilities for each telephone exchange office, it particularly is necessary to forecast the demand for the block areas. However, the compiling of such basic data was difficult and, furthermore, the time series data on the existing subscriber lines in the block areas could not be obtained. Through field surveys, we divided the whole Jakarta city area into the required area patterns and the total demand for each block area was forecasted by comparing the result of interview survey described in the microscopic demand forecast with similarly developed block areas.

2.4.1 Ownership Situation for Durable Consumer's Goods

As shown in Fig. 2.4.(2), the ownership ratio for durable consumer's goods in the R1 and R2 pattern areas is not different from that of Japan. The car diffusion rate in Jakarta in particular is higher than the rate in Japan. As the next purchasing plan for durable consumer's goods, the needs for telephones is the highest in the R2 pattern area. Since the telephone diffusion rate is high in the R1 pattern area, the piano is mentioned as the next purchasing plan. In the R3 pattern area, since the ownership ratio of the various kinds of durable consumer's goods is low, the telephone is not mentioned in the next purchasing plan. Since the transportation organs are not very developed in Jakarta, the need ratio for motorcycles is high in the R3 pattern area. As to the residential pattern area against the entire Jakarta area, the space ratio for R1 will be 2.3%, for R2 25.7% and for R3 21.4%. Although the ratio for R3 pattern area is quite high in comparison with the space area of other pattern areas, it is presumed that the telephone demand in this area will be very low due to the low ownership rate for the various kinds of durable consumer's goods over a short period.

2.4.2 Subscribers' Complaints about Telephone Service

As can be seen in Table 2.4.(9), according to the telephone questionnaire through interview survey, approximately 90% of the subscribers are unsatisfied with the present telephone service of PERUMTEL. The main complaints are the bad connections, misconnections, poor speech quality, etc. caused by lack of switching equipment and outside plant facilities, poor maintenance, etc. In the interview survey of business offices, regarding the question "Do you use other means when the call cannot be connected", the answer "Always" comprised 27% while "Sometimes" was 53%. (Refer to Table 2.4.(20).) As seen in the Table, about 80% of the subscribers go to the other party by car or send a telegram when the call cannot be connected, and this poses a very serious problem. Consequently, additional telephones wanted by heavy traffic subscribers should be given priority in installation of telephones not only for increasing the telephone revenue but for raising call completion ratio.

The standards for telephone installation in Japan were as follows:

Priority	
1st	Government offices
2nd	Additional application by heavy-traffic subscribers
3rd	Lapse of more than two years for business telephones and three year or more for residential telephones after application
4th	Applications by business offices, shops and Government employees
5th	Application from households
6th	Additional application from subscribers with low number of calls

2.4.3 Main Purpose for Needing Telephone

Special mention should be made in Table 2.4.(16) in that the main purpose for needing the telephone in the S-2 pattern area is mostly for private communication rather than business activities. Of course, due to the fact that the telephone has not been spread among the general public, it is believed that positive use of the telephone is not made for business. If the shop owners desire to raise the volume of sales by receiving purchase orders, etc. from the general consumers, he can consider such means as indicating on the store sign, etc. the telephone number of the shop as one means of letting the customers know his telephone number. Since the telephone is frequently used for business activities in Japan, the telephone number of the company is always advertised through the media of television, radio, newspapers, etc. so that the customers can easily contact the shop, company, etc. This means that the telephone has become a necessity in the social life in Japan. Consequently, with the spread of telephones in Jakarta, the telephones of the business establishments will be used more frequently for business activities.

2.4.4 Degree of Need for Telephones

According to Table 2.4.(6) the telephone diffusion ratio in the R1, R2 and R3 pattern areas are 70%, 27% and 0%, respectively. The ratio of needing the telephone within one year in the R1 pattern area is 6%, 20% in the R2 area and 9% in the R3 area. The need ratio in the R2 area in particular is the highest, it is believed that this is due to the comparatively low telephone holding rate of 27% although the customers in that pattern area have the ability to purchase the telephone. On the other hand, although the customers in the R3 pattern area do not have telephones, the ratio for needing the telephone within one year is very low. This is due to the low income and the need for purchasing various durable consumer's goods is greater than the need for the telephone.

In general, it is known from experience that need ratio according to the results of the interview survey is higher than the actual ratio. This is because at the time of the interview survey, the respondents answer without having firmly decided on what goods to buy out of

the living necessities or they are unable to actually foresee their future economic conditions. Accordingly, after the interview survey, the kind of goods will frequently be changed to other goods. For such reason, since the degree of need cannot be determined solely by the purchasing plan of the respondents, a cross analysis should be made of the income or other durable consumer's goods.

For example, in the R2 pattern area, although the percentage for needing the telephone within one year is 20%, if the low purchasing power of those with a monthly income of less than 50,000 Rupiahs can be excluded from this 20%, it is presumed that the effective demand will be among 10%. (Refer to Fig. 2.4.(14).)

2.4.5 Summary

A summary of the results of the interview survey is as under.

(1) Demand rate in the R1 pattern area inclusive of existing subscriber lines is very high.

(R1 = 76%, R2 = 47% and R3 = 9%)

(2) Ownership ratio of durable consumer's goods in the R1 and R2 pattern areas is high. The telephone diffusion rate in the R1 pattern area is about 70%.

(3) Subscribers' complaints such as about bad connections, poor speech quality, etc. are numerous.

(4) Telephone use for business is still low in the shops.

(5) Non-submission of applications is due largely to economic reasons.

(6) Monthly income of most present subscribers is more than 50,000 Rupiahs.

(7) 65% of the existing subscribers in the office areas desire additional telephones.

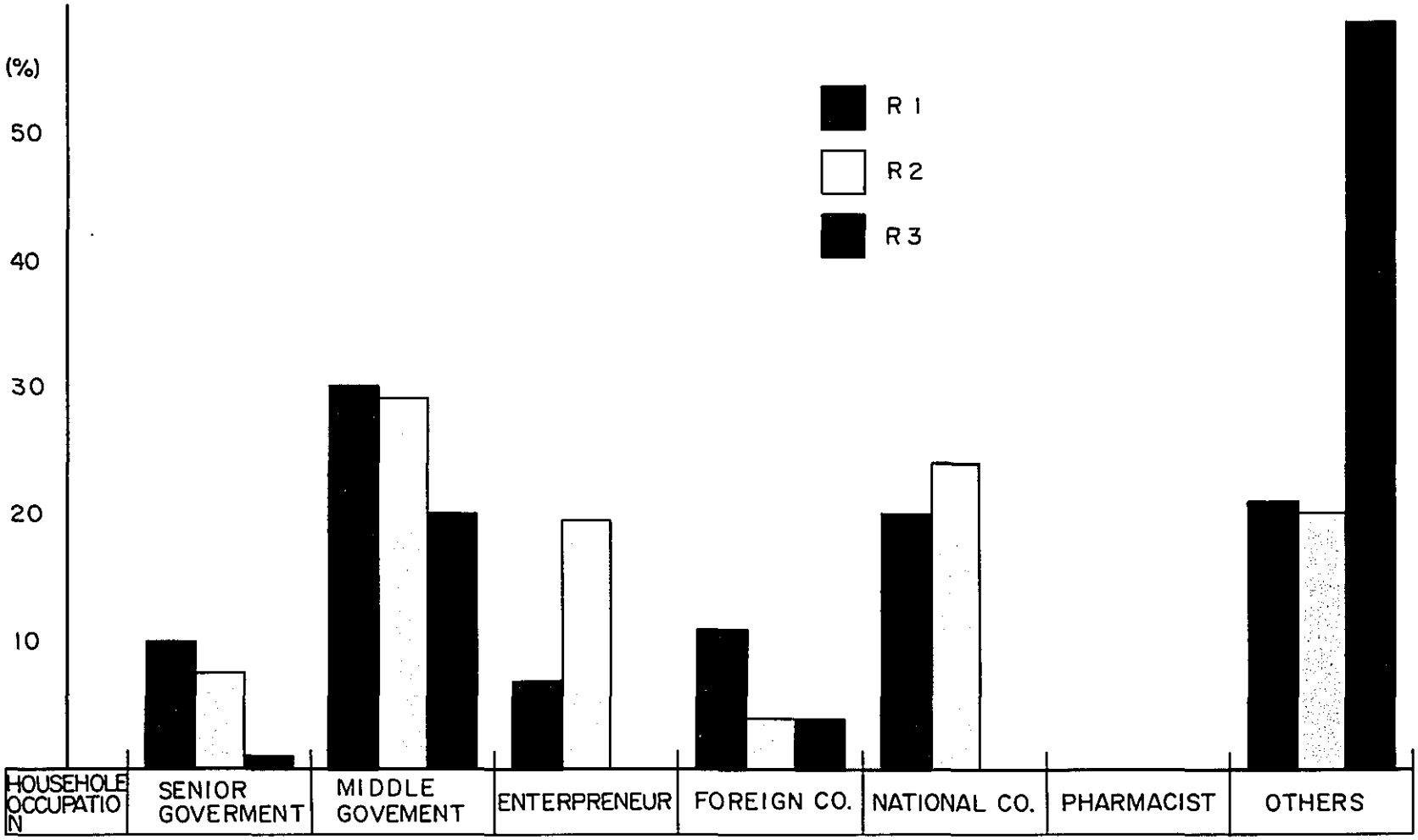


FIG. 2-4-(1.) DISTRIBUTION OF HOUSEHOLD OCCUQATION BY AREA PATTERN

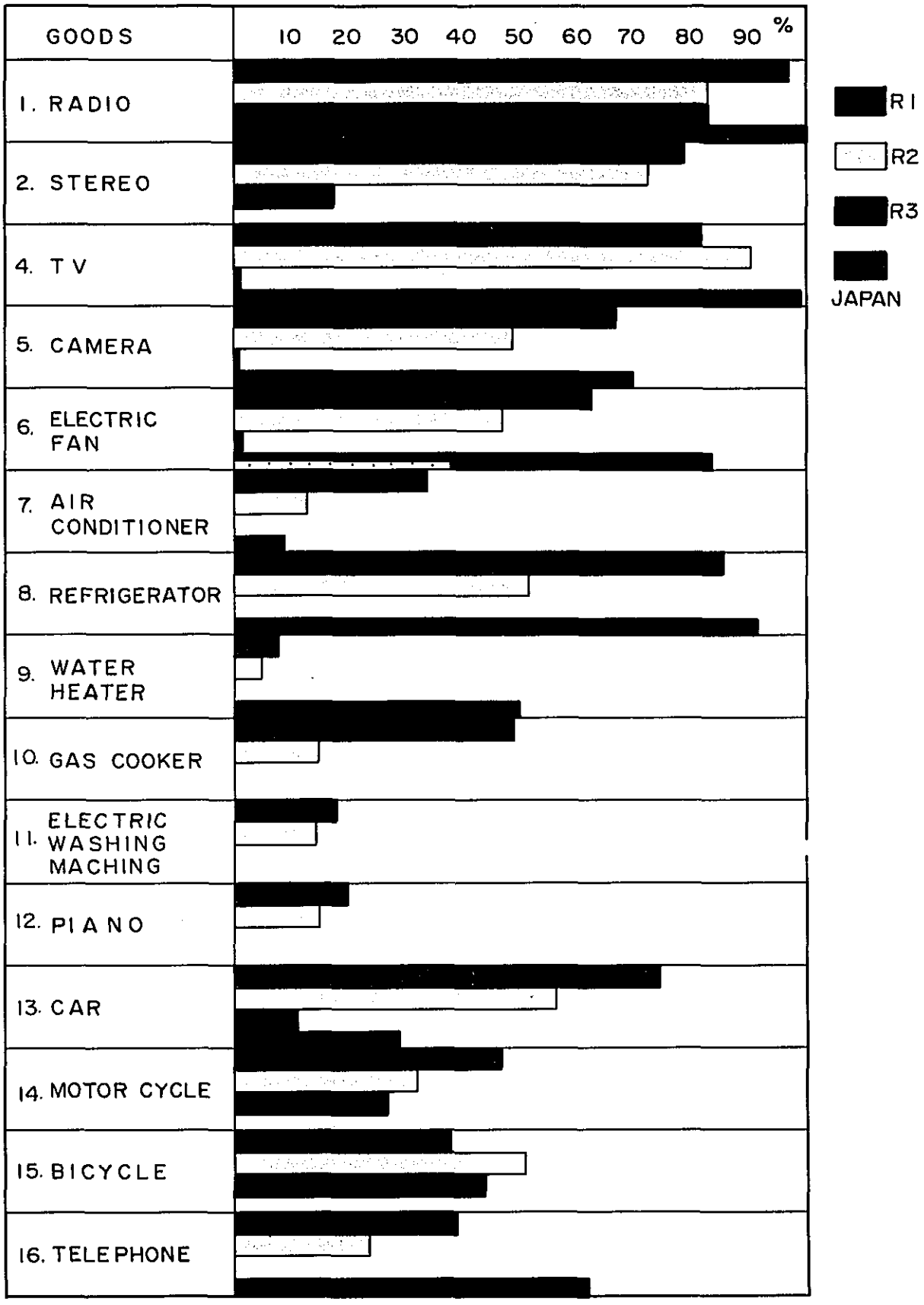


FIG. 2-4-(2) OWNERSHIP RATIO FOR DURABLE CONSUMER'S GOODS

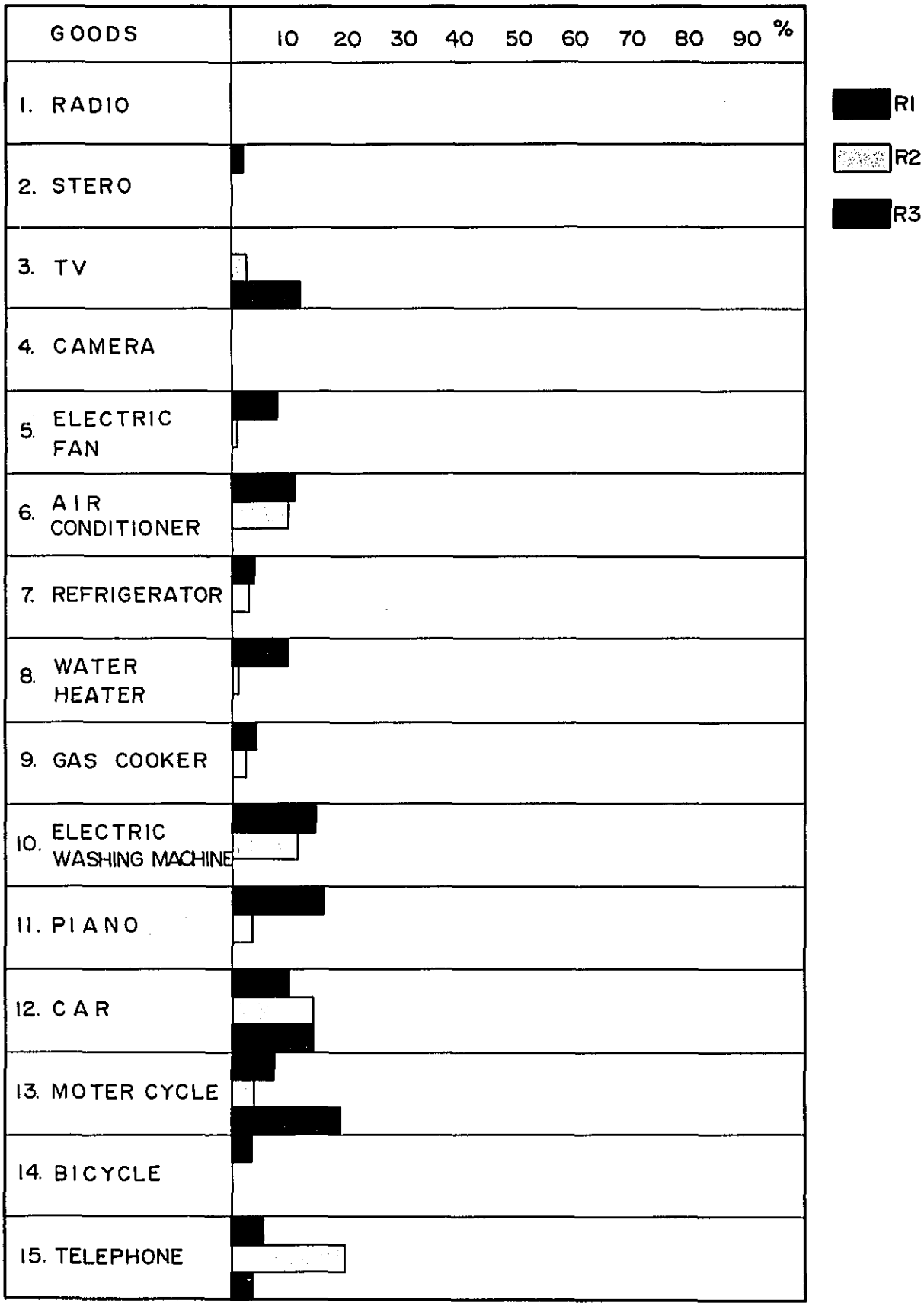


FIG. 2-4-(3) % DISTRIBUTION OF DURABLE CONSUMER'S GOOD NEEDS

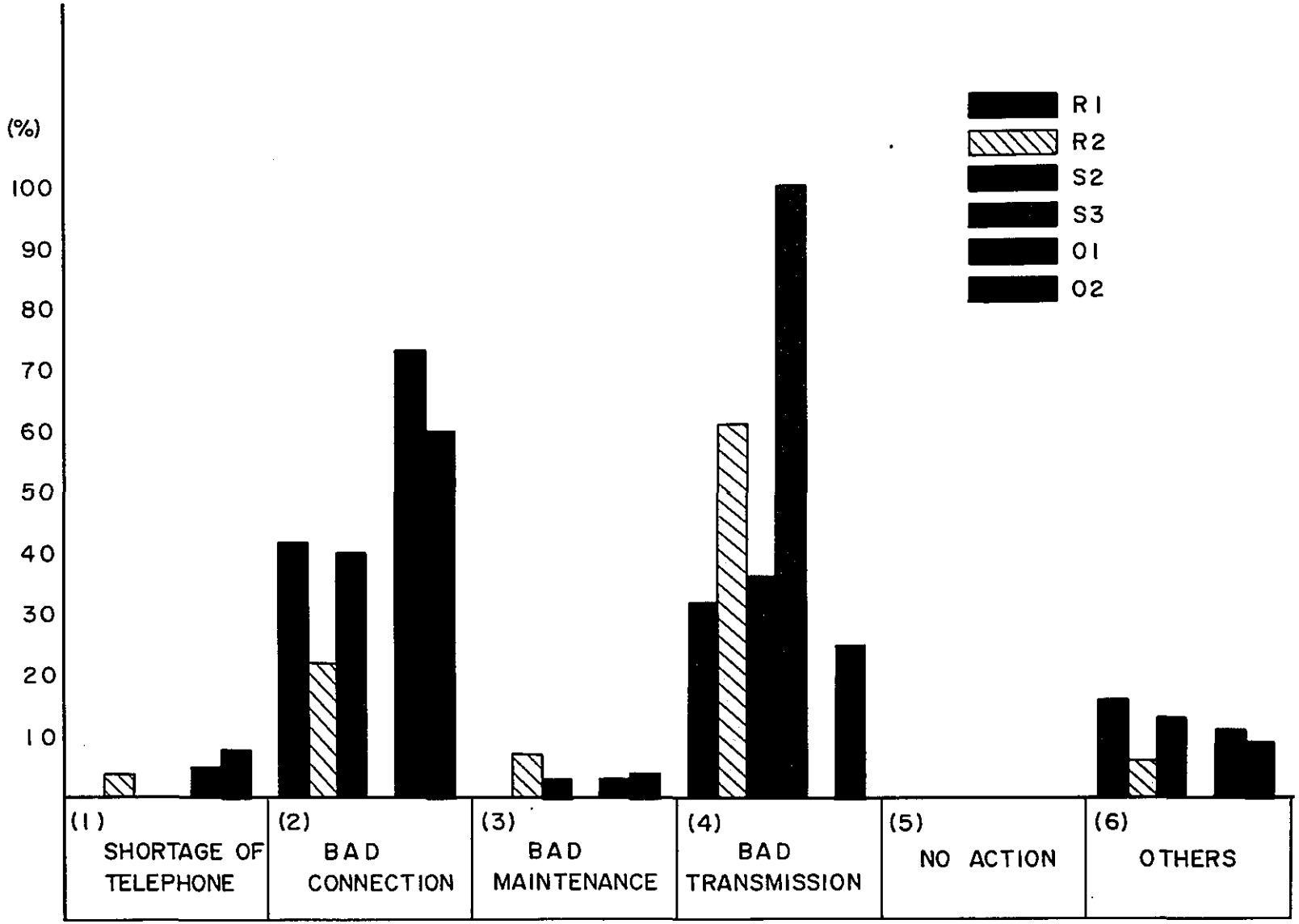


FIG. 2-4-(4) DISTRIBUTION OF COMPLAINT BY AREA PATTERN (R,S,O)

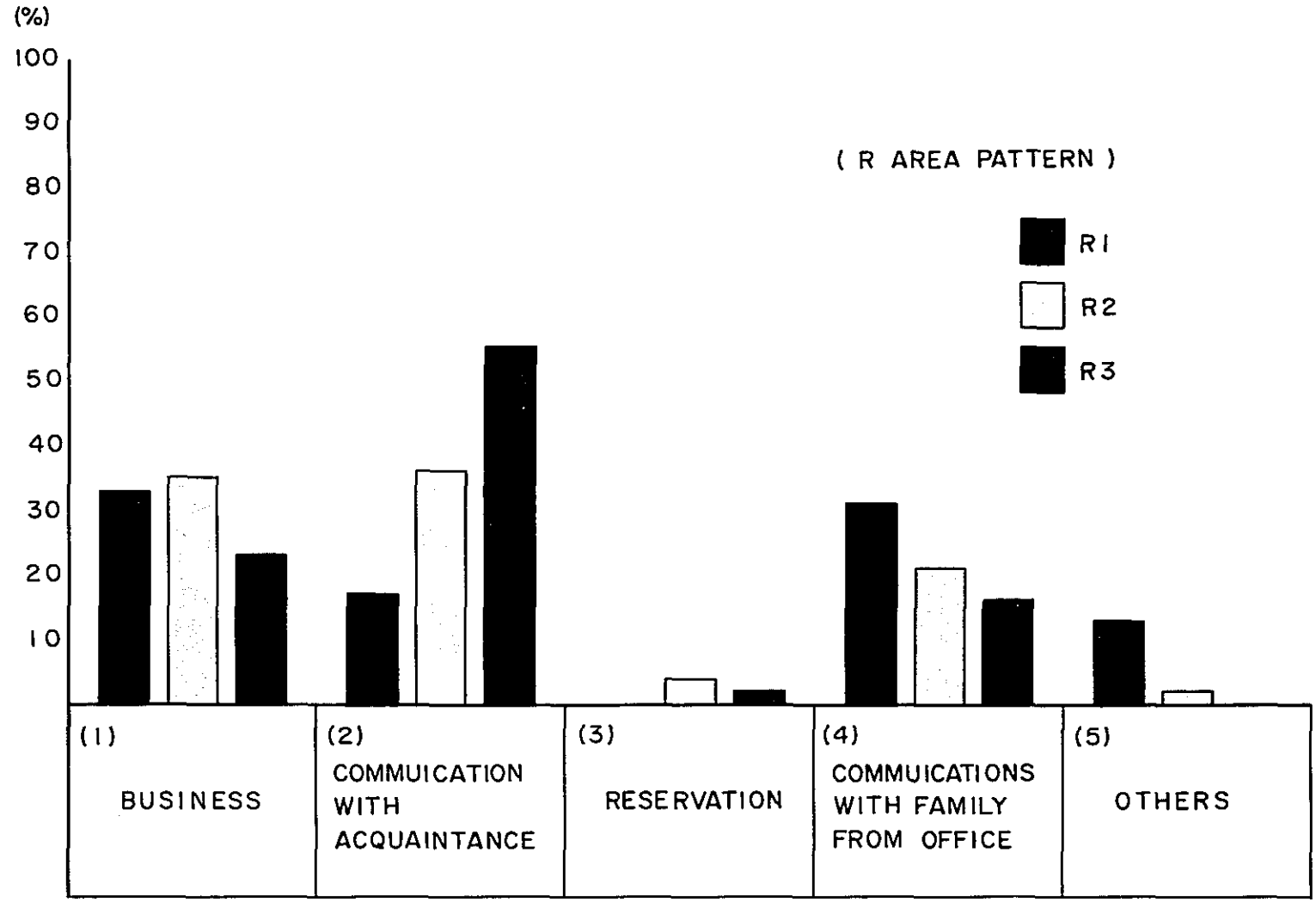


FIG. 2-4-(5) MAIN PURPOSE FOR NEEDING A TELEPHONE

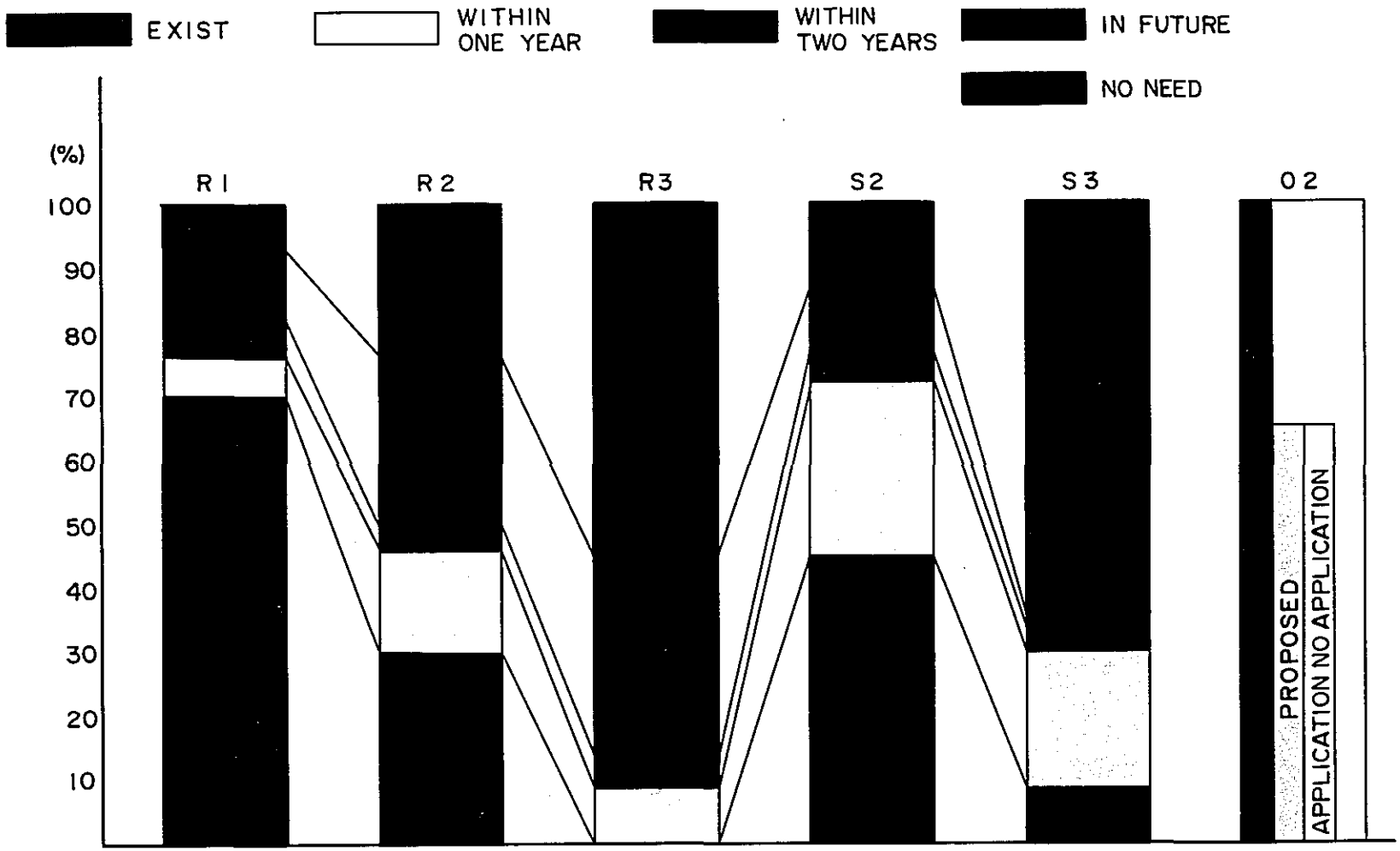


FIG. 2-4-(6) DISTRIBUTION OF TELEPHONE NEED BY AREA PATTERN

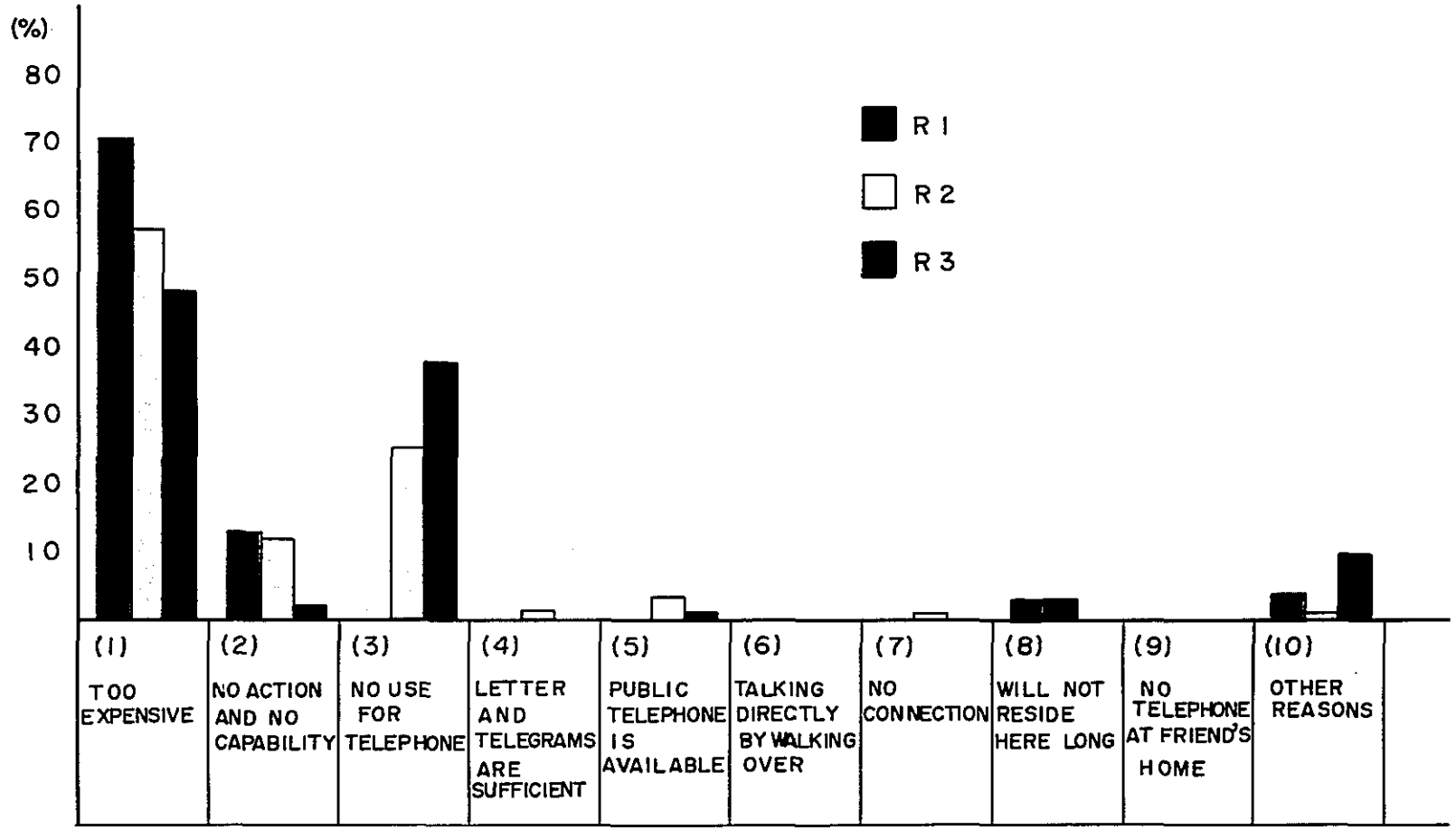


FIG. 2-4-(7) MAIN REASON FOR NOT NEEDING FOR A TELEPHONE SERVICE (AREA PATTERN)

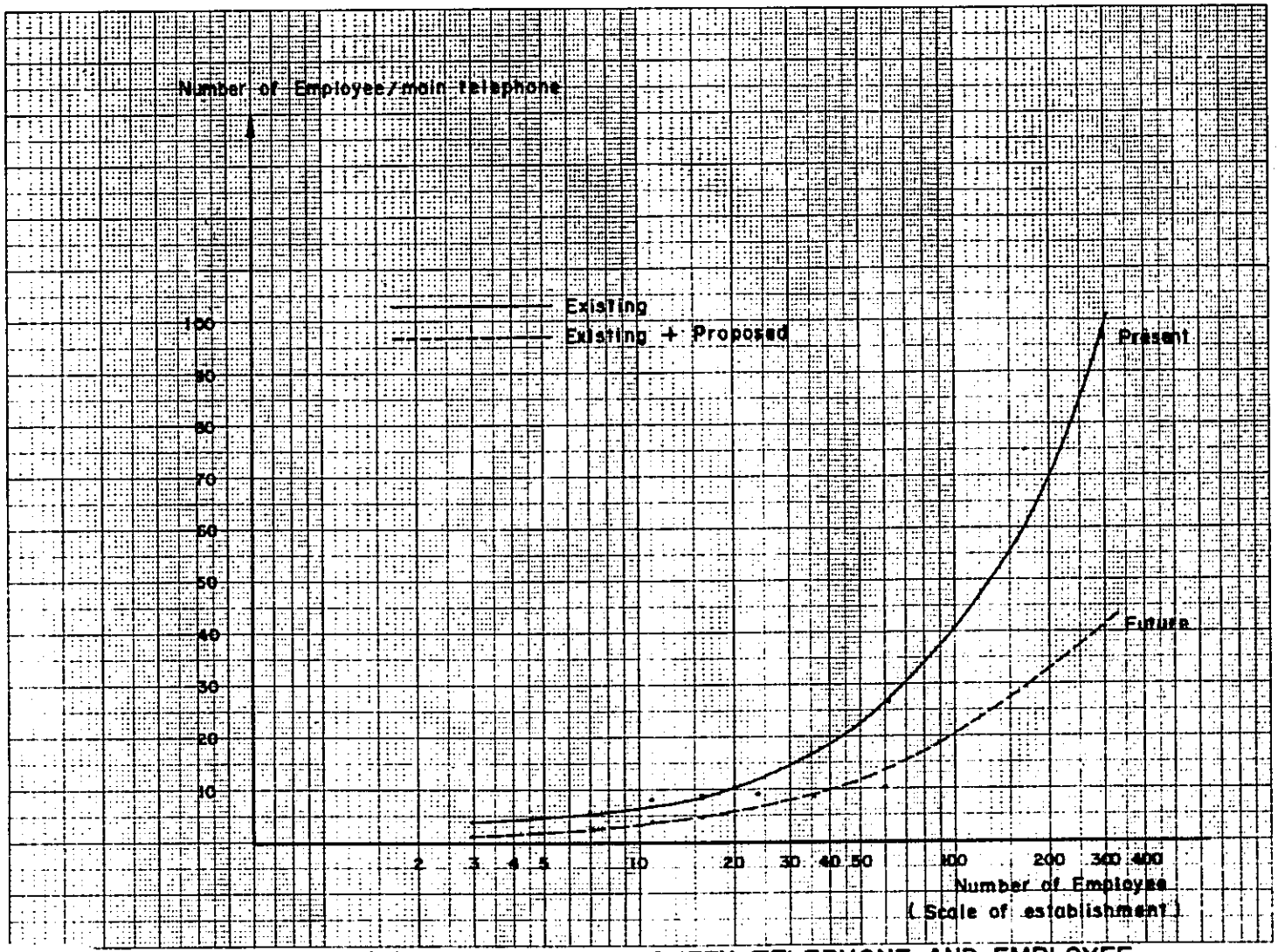


FIG. 2-4-(8) CORRELATION BETWEEN TELEPHONE AND EMPLOYEE IN NUMBER (02 PATTERN)

TABLE 2-4-(9) RESULT OF QUESTIONAIRE

AREA PATTERN	TELEPHONE (1)	TELEPHONE (2)	TELEPHONE TOTAL	NEEDS OF TELEPHONE (1)	NEEDS OF TELEPHONE (2)	NEEDS OF TELEPHONE (3)	NEEDS OF TELEPHONE (4)	NEEDS OF TELEPHONE TOTAL	COMPLAINTS (1)	COMPLAINTS (2)	COMPLAINTS (3)	COMPLAINTS (4)	COMPLAINTS (5)	COMPLAINTS (6)	COMPLAINTS TOTAL	REMARKS
R1	(70%) 70	(30%) 30	(100%) 100	(20%) 6	(20%) 6	(37%) 11	(23%) 7	(100%) 20		(42%) 25		(32%) 19		(26%) 16	(100%) 60	
R2	(27%) 41	(73%) 109	(100%) 150	(28%) 30	(6%) 7	(33%) 36	(33%) 36	(100%) 109	(2%) 1	(22%) 9	(7%) 3	(62%) 25		(7%) 3	(100%) 41	
R3	0	(100%) 100	(100%) 100	(9%) 9	(5%) 5	(31%) 31	(55%) 55	(100%) 100	-	-	-	-	-	-	-	
S2	(45%) 68	(55%) 82	(100%) 150	(49%) 40	(10%) 8	(18%) 15	(23%) 19	(100%) 82		(40%) 25	(1%) 1	(46%) 29		(13%) 8	(100%) 63	
S3	(8%) 8	(92%) 92	(100%) 100	(24%) 22	(5%) 5	(2%) 2	(69%) 63	(100%) 92				(100%) 2			(100%) 2	
O1	(100%) 50	-	(100%) 50		(56%) 28		(44%) 22	(100%) 50	(10%) 5	(60%) 28		(15%) 7		(15%) 7	(100%) 47	
O2	(91%) 136	(9%) 14	(100%) 150		(65%) 97		(35%) 53	(100%) 150	(4%) 5	(60%) 73	(2%) 3	(25%) 30		(9%) 11	(100%) 122	

373

(1) TELEPHONE EXISTS
(2) NO TELEPHONE

(1) WITHIN ONE YEAR
(2) WITHIN TWO YEAR
(3) FUTUARE
(4) NO NEED

(1) SHORTAGE OF TELEPHONE
(2) BAD CONNECTION
(3) BAD MAINTENANCE
(4) BAD TRASMISSION
(5) NO ACTION
(6) OTHERS

TABLE 2-4-(10) RESULT OF QUESTIONAIRE

AREA PATTERN	(Q.11) SCALE OF MONTHLY INCOME	(Q.10) HOUSEHOLD OCCUPATION								(Q.1) HOLDING OF TEL.			(Q2) NEEDS OF TELEPHONE				
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	(1)	(2)	TOTAL	(1)	(2)	(3)	(4)	TOTAL
R1 (100)	10,000 RP.																
	20,000		1			1			(2%) 2		2	(2%)				2	(7%)
	30,000		1						(1%) 1		1	(1%) 1				1	(3%) 1
	50,000	2	9	1		6		6	(24%) 24	12	12	(24%) 24	1	1	5	5	(40%) 12
	70,000	1	12			8		5	(26%) 26	16	8	(26%) 26		4	2	2	(27%) 8
	MORE 70,000	7	6	7	11	5		11	(47%) 47	40	7	(47%) 47	5	1		1	(23%) 7
	TOTAL	(10%) 10	(29%) 29	(8%) 8	(11%) 11	(20%) 20		(22%) 22	(100%) 100	(70%) 70	(20%) 30	(100%) 100	(20%) 6	(20%) 6	(23%) 7	(37%) 11	(100%) 30
R2 (150)	10,000 RP.		1	2				6	(6%) 9	1	8	(6%) 9	1	0	5	2	(7%) 8
	20,000	1	6	5	1	3	0	13	(19%) 29	8	21	(19%) 29	5	1	8	7	(19%) 21
	30,000	0	9	4		4		20	(18%) 27	3	24	(18%) 27	1	3	12	8	(22%) 24
	50,000	3	13	4		9		3	(21%) 32	8	24	(21%) 32	7	1	6	10	(22%) 24
	70,000	1	3	2		9		6	(14%) 21	5	16	(14%) 21	7	1	2	6	(15%) 16
	MORE 70,000	3	3	8	2	11		5	(22%) 32	16	16	(22%) 32	10	1	3	2	(15%) 16
	TOTAL	(5%) 8	(23%) 35	(17%) 25	(2%) 3	(24%) 36	0	(29%) 43	(100%) 150	(27%) 41	(73%) 100	(100%) 150	(29%) 31	(6%) 7	(33%) 36	(32%) 35	(100%) 109
R3 (100)	10,000 RP.			5				3	(8%) 8	0	8	(8%) 8			7	1	(8%) 8
	20,000	1	29	8		3		17	(58%) 58	0	58	(58%) 58	1	3	39	15	(58%) 58
	30,000		5	5					(10%) 10	0	10	(10%) 10	1		5	4	(10%) 10
	50,000		5	7	1	1		2	(16%) 16	0	16	(16%) 16	5	1	3	6	(16%) 16
	70,000		1	1	1			2	(5%) 5	0	5	(5%) 5	1			4	(5%) 5
	MORE 70,000	2						1	(3%) 3	0	3	(3%) 3	1	1		1	(3%) 3
	TOTAL	(3%) 3	(40%) 40	(25%) 26	(2%) 2	(4%) 4		(25%) 25	100	0	100	100	(9%) 9	(5%) 5	(55%) 55	(31%) 11	(100%) 100

(1) SENIOR GOVERNMENT EMPLOYEE
(2) MIDDLE GOVERNMENT EMPLOYEE
(3) ENTERPRENEUR GOVERNMENT EMPLOYEE
(4) FOREIGH COMPANY EMPLOYEE
(5) NATIONAL COMPANY EMPLOYEE
(6) PHARMACIST
(7) OTHERS

(1) TELEPHONE
(2) NO TELEPHONE

(1) WITHIN ONE YEAR
(2) WITHIN TWO YEARS
(3) NO NEED
(4) IN FUTURE.

TABLE 2-4-(11) RESULT OF QUESTIONAIRE

AREA PATTERN	(Q.11) SCALE OF MONTHLY INCOME	(Q.3) MAIN PURPOSE FOR A TELEPHONE						(Q.4) MAIN REASON FOR NOT NEEDING THE TELEPHONE										
		(1)	(2)	(3)	(4)	(5)	TOTAL	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	TOTAL
R1	10,000 RP.																	
	20,000	2					(2%) 2	2										(7%) 2
	30,000	1					(1%)		1									(3%) 1
	50,000	8	5		5	1	(20%) 19	8	3								1	(40%) 12
	70,000	4	3		8	9	(26%) 24	6							1		1	(27%) 8
	MORE 70,000	16	8		20	3	(51%) 47	5									2	(23%) 7
	TOTAL	(33%) 31	(17%) 16		(38%) 33	(14%) 13	(100%) 93	(70%) 21	(13%) 4						(3%) 1		(13%) 4	(100%) 30
R2	10,000		4	0	1		(4%) 5	4	1	3								(7%) 8
	20,000	5	10	1	3	1	(18%) 20	12	0	6		1			1		1	(19%) 21
	30,000	4	7	0	4		(13%) 15	12	3	7		1		1				(22%) 24
	50,000	9	9		8		(14%) 26	16	2	3		1					2	(22%) 24
	70,000	6	8		4	1	(17%) 19	9	3	2							2	(15%) 16
	MORE 70,000	16	10		3		(25%) 29	9	4	2					1			(15%) 16
	TOTAL	(35%) 40	(42%) 48	(5%) 1	(20%) 23	(2%) 2	(100%) 114	(57%) 62	(12%) 13	(21%) 23		(3%) 3		(1%) 1	(2%) 2		(5%) 5	(100%) 109
R3	10,000	1					(2%) 1	1		4		1					2	(8%) 8
	20,000	4	13	1	1		(42%) 19	31		24							3	(58%) 58
	30,000	1			4		(11%) 5	4		4							2	(10%) 10
	50,000	2	9		1		(27%) 12	9		5							2	(16%) 16
	70,000	2	1		2		(11%) 5	5										(5%) 5
	MORE 70,000		3				(7%) 3	1	2									(3%) 3
	TOTAL	(22%) 10	(58%) 26	(2%) 1	(18%) 8		(100%) 45	(51%) 51	(2%) 2	(37%) 37		(1%) 1					(9%) 9	(100%) 100

(1) TOO EXPENSIVE
(2) NO INSTALLATION CAPABILITY OF PERUMTEL
(3) NO USE FOR A TELEPHONE
(4) LETTER AND TELEGRAM ARE SUFFICIENT
(5) PUBLIC TELEPHOE IS AVAILABLE
(6) TALKING DIRECTLY BY WALKING OVER
(7) NO CONNECTION
(8) WILL NOT RESIDE HERA LONG
(9) NO TELEPHONE AT FRIEND HOUSE
(10) OTHERS

TABLE 2-4-(12) RESULT OF QUESTIONAIRE

	(Q.11) SCALE OF MONTHLY INCOME	(Q.7) (1) RADIO	(2) STEREO	(3) T.V	(4) CAMERA	(5) ELECTRIC FAN	(6) AIR-CONDITIONER	(7) REFFIGERATOR	(8) WATER HEATER	(9) GAS COOKER	(10) ELECTRIC WASHING MACHINES	(11) PIANO	(12) CAR	(13) MOTOR CYCLE	(14) BICYCLE	(15) TELE PHONE
R1 (100)	10,000															
	20,000	2	1	2		1		2					2			
	30,000	1	1				1						1			
	50,000	24	13	22	11	8	3	19		9	2	3	14	14	12	6
	70,000	25	24	26	14	14	6	22	1	9	6	4	15	7	14	16
	MORE 70,000	46	40	32	42	40	24	43	7	31	10	12	42	27	12	17
	TOTAL	(98%) 98	(79%) 79	(82%) 82	(67%) 67	(63%) 63	(34%) 34	(36%) 36	(8%) 8	(49%) 49	(16%) 18	(19%) 19	(74%) 74	(48%) 48	(38%) 38	(39%) 39
R2 (150)	10,000	7	8	10	4	2		5		1		1	4	5	5	2
	20,000	45	32	41	10	15	2	21	2	1	4	1	16	14	26	8
	30,000	22	15	22	12	14	1	10		3	2	3	16	4	10	5
	50,000	25	21	24	17	13	3	16		3	4	2	18	10	12	5
	70,000	5	5	6	5	1		1		1	1	1	3	2	4	1
	MORE 70,000	31	28	34	26	25	13	26	5	13	10	15	27	13	19	13
	TOTAL	(90%) 135	(73%) 109	(91%) 137	(49%) 74	(47%) 70	(13%) 19	(53%) 79	(5%) 7	(15%) 22	(14%) 21	(15%) 23	(56%) 84	(32%) 48	(51%) 76	(23%) 34
R3 (100)	10,000	1	1											3	2	0
	20,000	53	4	2									2	10	31	0
	30,000	10	1	5									1	3	6	0
	50,000	14	8	7	1	1		3			1		5	8	5	0
	70,000	3	3	2									2	2		
	MORE 70,000	2	2	2									1	1		
	TOTAL	(83%) 83	(19%) 19	(18%) 18	(1%) 1	(1%) 1		(3%) 3			(1%) 1		(11%) 11	(27%) 27	(44%) 44	0

TABLE 2-4-(13) RESULT OF QUESTIONAIRE

RESIDENCE RII

(Q.2) TELEPHONE NEEDS	(Q.10) HOUSEHOLD OCCUPATION								(Q.11) SCALE OF MONTHLY INCOME (IN THOUSANDS)												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	2	4	6	8	10	12	14	20	30	50	70	MORE 70	TOTAL
TELEPHONE EXIST	10	24	4	11	9		12	(70%) 70										12	18	40	(70%) 70
WITHIN ONE YEAR			2		2		2	(6%) 6										1		5	(6%) 6
WITHIN TWO YEARS		2			3		1	(6%) 6										1	4	1	(6%) 6
IN FUTURE		3			5		3	(11%) 11							1	1	1	5	2	1	(11%) 11
NO NEED		1	1		1		4	(7%) 7										5	2		(7%) 7
TOTAL		6	3	0	11		10	(30%) 30							1	1	1	12	8	7	(30%) 30
GRND TOTAL	(10%) 10	(30%) 30	(7%) 7	(11%) 11	(20%) 20	0	(22%) 22	(100%) 100							(1%) 1	(1%) 1	(1%) 1	(24%) 24	(26%) 26	(47%) 47	(100%) 100

(1) SENIOR GOVERNMENT EMPLOYEE
(2) MIDDLE GOVERNMENT EMPLOYEE
(3) ENTERPRENEUR GOVERNMENT EMPLOYEE
(4) FOREIGN COMPENY EMPLOYEE
(5) NATIONAL COMPANY EMPLOYEE
(6) PHARMACIST
(7) OTHERS

TABLE 2-4-(14) RESULT OF QUESTIONAIRE

RESIDENCE R2.

(Q2) TELEP-HONE NEED	(Q.10) HOUSEHOLD OCCUPATION								(Q.11) SCALE OF MONTHLY INCOME (IN THOUSANDS)												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	RP 2	4	6	8	10	12	14	20	30	50	70	MORE 70	TOTAL
TELEP-HONE EXIST	6	8	8	1	8		10	(27%) 41			1		1	1	2	4	3	8	5	16	(27%) 41
WITHIN ONE YEAR	1	9	6		7		7	(20%) 30					1	2		3	1	7	7	9	(20%) 30
WITHIN TWO YEARS	1	1			2		3	(5%) 7						1			3	1	1	1	(5%) 7
IN FUTURE		10	4	2	9		11	(24%) 36				1	1		1	6	8	10	6	3	(24%) 36
NO NEED		7	7		10		12	(24%) 36		1	1	2	1	2	1	5	12	6	2	3	(24%) 36
TOTAL	2	27	17	2	28		33	(73%) 109		1	1	3	3	5	2	14	24	24	16	16	(73%) 109
GRAND TOTAL	(5%) 8	(23%) 35	(17%) 25	(2%) 3	(24%) 36		(29%) 43	(100%) 150		(1%) 1	(1%) 2	(2%) 3	(3%) 4	(4%) 6	(3%) 4	(12%) 18	(18%) 27	(21%) 32	(14%) 21	(14%) 32	(100%) 150

(1) SENIOR COVERNMENT EMPOYEE
(2) MIDDLE COVERNMENT EMPOYEE
(3) ENTEPRENEUR GOVERNMENT EMPLOYEE
(4) FOREIGH COMPANY EMPLOYEE
(5) NATIONAL COMPANY EMPLOYEE
(6) PHAMACIST
(7) OTHERS

TABLE 2-4-(15) RESULT OF QUESTIONAIRE

RESIDENCE R3

(Q.2) TELEPHONE NEEDS	(Q.10) HOUSEHOLD OCCUPATION								(Q.11) SCALE OF MONTHLY INCOME (IN THOUSANDS)												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	RP. 2	4	6	8	10	12	14	20	30	50	70	MORE 70	TOTAL
TELEPHONE EXIST																					
WITHIN ONE YEAR	1	4	1				3	(9%) 9								1	1	5	1	1	(9%) 9
WITHIN TWO YEAR			1				4	(5%) 5						2		1		1		1	(5%) 5
IN FUTURE		6	8		2		15	(31%) 31					1	1	4	10	4	6	4	1	(31%) 31
NO NEED		10	6		2		37	(55%) 55		1	1	4	1	9	10	20	5	4			(55%) 55
T O T A L	1	20	16		4		59	(100%) 100		1	1	4	2	12	14	32	10	16	5	3	(100%) 100
GRAND TOTAL	(1%) 1	(20%) 20	(16%) 16		(4%) 4		(59%) 59	(100%) 100		(1%) 1	(1%) 1	(4%) 4	(2%) 2	(12%) 12	(14%) 14	(32%) 32	(10%) 10	(16%) 16	(5%) 5	(3%) 3	(100%) 100

(1) SENIOR GOVERNMENT EMPLOYEE
(2) MIDDLE GOVERNMENT EMPLOYEE
(3) ENTERPRENEUR
(4) FOREIGN COMPANY EMPLOYEE
(5) NATIONAL COMPANY EMPLOYEE
(6) PHARMACIST
(7) OTHERS

TABLE 2-4-(16) RESULT OF QUESTIONAIRI

SHOP S2

(Q.5) TELEPHONE NEEDS	(Q.1) ECONOMIC ACTIVITY					(Q.2) NUMBER OF EMPLOYEES							(Q.8) MAIN PURPOSE FOR NEEDING A TELEPHON						(Q.9) MAIN REASON FOR NOT PROPOSING THE TELEPHONE INSTALLATION							
	(1)	(2)	(3)	(4)	TOTAL	2	3	5	6	10	MORE 10	TOTAL	(1)	(2)	(3)	(4)	(5)	TOTAL	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL
TELEPHONE EXIST	2	55	7	4	(45%) 68	20	19	12	1	7	9	(49%) 68	4		61		3	(52%) 68								
WITHIN ONE YEAR	1	31	5	3	(27%) 40	17	8	8	4	2	1	(27%) 40	10		20		10	(31%) 40	29	10					1	(49%) 40
WITHIN TWO YEAR		6	2		(5%) 8	4	2			2		(5%) 8	1	1	5		1	(6%) 8	6						2	(10%) 8
IN FUTURE		13	1	1	(10%) 15	7	3	3	2			(10%) 15	4	1	8		2	(11%) 15	8	1				3	3	(8%) 15
NO NEED		18	1		19	10	2	4	1	1	1	19							8		1			7	3	19
TOTAL	1	68	9	4	(55%) 82	38	15	15	7	5	2	(59%) 82	15	2	33		13	(48%) 63	51	11	1			10	9	(100%) 82
GRAND TOTAL	(2%) 3	(82%) 123	(11%) 16	(5%) 8	(100%) 150	(39%) 58	(23%) 34	(18%) 27	(15%) 8	(8%) 12	(7%) 11	(100%) 150	(14%) 19	(2%) 2	(72%) 94		(12%) 16	(100%) 131	(63%) 51	(13%) 11	(1%) 2			(12%) 10	(11%) 9	(100%) 82

(Q 1) (1) WHOLESALE
(2) RETAILER
(3) SERVICE
(4) OTHERS

(Q 8) (1) CONVINIENT FOR GELLING ORDERS FROM CUSTOMERS
(2) CONVINIENT FOR PLOCING ORDER
(3) COMMUNICATION WITH TRIENDS
(4) RESERVATION
(5) OTHERS

(Q 9) (1) TOO EXPENSIVE
(2) NO INSTALLATION CAPABILLTY
(3) MOTER CARS ARE AVAILABLE
(4) LETTERS AND TELEGRAMS ARE SUFFICIENT
(5) NO TELEPHONE AT ACQUAINTANCE
(6) NO URGENT WORX
(7) OTHERS

TABLE 2-4-(17) RESULT OF QUESTIONAIRE

SHOP S3

(Q.5) TELEPH-ONE NEEDS	(Q.1) ECONOMIC ACTIVITY					(Q.2) NUMBER OF EMPLOYEES							(Q.8) MAIN PURPOSE FOR NEEDING A TELEPHONE						(Q.9) MAIN REASON FOR NOT PROPOSING THE TELEPHONE INSTALLATION							
	(1)	(2)	(3)	(4)	TOTAL	2	3	5	6	10	10	TOTAL	(1)	(2)	(3)	(4)	(5)	TOTAL	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL
TELEPH-ONE EXIST		8			(8%) 8	1	5	2				(6%) 8	2	1	5			(22%) 8								
WITHIN ONE YEAR		17	5		(22%) 22	13	9	1				(22%) 22	1	1	20			(22%) 22	9	1	1			1	10	(22%) 22
WITHIN TWO YEARS		5			(5%) 5	1	2	2				(5%) 5	1		4			(14%) 5	5	0						(5%) 5
IN FUTURE		1	1		(2%) 2	1	1					(2%) 7			2			(5%) 2	2							(2%) 2
NO NEED		53	9	1	(63%) 63	43	16	4				(63%) 63							23					22	18	(68%) 63
TOTAL		76	15	1	(92%) 92	58	28	7				(92%) 92	2	1	26			(78%) 29	39	1	1			23	28	(100%) 92
GRAND TOTAL		(84%) 84	(15%) 15	(1%) 1	(100%) 100	(59%) 59	(33%) 33	(9%) 9				(100%) 100	(11%) 4	(5%) 2	(84%) 31			(100%) 37	(42%) 39	(1%) 1	(1%) 1			(25%) 23	(30%) 28	(100%) 92

(1) CONVENIENT FOR ORDER FROM CUSTMERS
(2) CONVENIENT FOR GIVING ORDER
(3) COMMUNCATION WITH ACQUAINTANCE
(4) RESERVATION
(5) OTHERS

(1) TOO EXPENSIVE
(2) NO INSTALLATION CAPABILITY
(3) MOTORCARS ARE AVAILABL
(4) LETTERS AND TELEGRAMS ARE SUFFICIENT
(5) NO TELEPHONE AT ACQUAINTANCE
(6) NO URGENT WORK
(7) OTHERS

(1) CONVENIENT FOR GETTING ORDERS FROM CUSTMERS
(2) CONVENIENT FOR PLACING ORDERS
(3) CONVENIENT FOR COMMUNICATING WITH FRIENDS
(4) CONVENIENT FOR MAKING RESERVATION AT HOTEL, AIR LINE, ATC
(5) OTHERS

TABLE 2-4-(18) RESULT OF QUESTIONAIRE

OFFICE 01

(Q.1) KIND OF ECONOMIC ACTIVITY	(Q.2) NUMBER OF EMPLOYEES							(Q.8) APPLICATION			(Q.9) REASON FOR NOT SUBMITTING THE APPLICATION					(Q.11) USEFUL FOR INFORMATION TRANSMISSION				(Q.12) USING OF OTHER TRANSPORATION				
	4	9	29	49	199	MORE 100	TOTAL	YES	NO	TOTAL	1	2	3	4	TOTAL	1	2	3	TOTAL	1	2	3	4	TOTAL
COVERNMENT SERVICE				1		10	(22%) 11	7	4	(22%) 11	1			3	(16%) 4	10	1		(22%) 11	3	6	1	1	(22%) 11
AGRICULTURE FISHERY																								
MINING QUARRYING					3	2	(10%) 5		5	(10%) 5	1			4	(20%) 5	3	1	1	(10%) 5	1	4			(100%) 5
MANUFACURING					1	3	(8%) 4	2	2	(8%) 4			1	1	(8%) 2	3		1	(8%) 4		4			(8%) 4
CONSTRUCTION				1			(2%) 1	1		(2%) 1						1			(2%) 1	1				(2%) 1
COMMERCE					2	2	(8%) 4	2	2	(8%) 4				2	(8%) 2	4			(8%) 4		3	1		(8%) 4
TRANSPORTATION			2			1	(6%) 3	1	2	(6%) 3	1			1	(8%) 2	2		1	(6%) 3		3			(6%) 3
SERVICE			2	2	1	14	(38%) 19	11	8	(38%) 19				8	(32%) 8	17	1	1	(38%) 19	6	9	4		(38%) 19
OTHERS	1		1	1			(6%) 3	1	2	(6%) 3				2	(8%) 2	2		1	3		2	1		(6%) 3
TOTAL	(2%) 1		(10%) 5	(10%) 5	(14%) 7	(64%) 32	(100%) 50	(50%) 25	(50%) 25	(100%) 50	(12%) 3		(4%) 1	(84%) 21	(100%) 25	(84%) 42	(6%) 3	(10%) 5	(100%) 50	(22%) 11	(62%) 31	(14%) 7	(2%) 1	(100%) 50

(1) VERY DIFFICULT FOR THE REALIZATION
(2) TOO EXPENSIVE
(3) NO POSSIBLLITY OF STAYING NER FOR A LONG TIME
(4) OTHERS

(1) TELEPHONE
(2) CAR
(3) NO DIFFERENCE

(1) ALWAYS
(2) SOMETIMES
(3) VERYSELDOM
(4) NEVER

TABLE 2-4-(19) RESULT OF QUESTIONAIRE

OFFICE 01

(Q7) NEED OF TELEPHONE	(Q.2) NUMBER OF EMPLOYEES							(Q.3) (EXISTING) MAIN STATION						(Q3) (EXISTAIN) EXTENSION						(Q.8) APPLICATION			(Q9) REASON FOR NOT SUBMITTING APPLICATION FOR ADDITIONAL TEL.				
NUMBER OF TELEPHONE	-4	-9	-29	-49	-99	MORE 100	TOTAL	-2	-4	-6	-8	MORE 10	TOTAL	-2	-4	-6	-8	MORE -10	TOTAL	YES	NO	TOTAL	1	2	3	4	TOTAL
-2			1	1	1		(6%) 3	1	1				(4%) 2	2				1	(7%) 3	2	1	(6%) 3			1		(4%) 1
-4	1		2		1	5	(18%) 9	1	4		1	3	(19%) 9	1			1	5	(15%) 7	7	2	(18%) 9			2		(8%) 2
-6			1		1	1	(6%) 3	1				2	(6%) 3	1		1		1	(7%) 3	3		(6%) 3					
-8				1		2	(6%) 3	1	1		1		(6%) 3					3	(7%) 3	3		(6%) 3					
-10			1			3	(8%) 4	1			2	1	(8%) 4					4	(9%) 4	2	2	(8%) 4				2	(8%) 2
MORE 10						6	(12%) 6			1		5	(12%) 6					6	(13%) 6	6		(12%) 6					
ENOUGH				3	4	15	(44%) 22	2	8	3	2	7	(45%) 2		2		1	17	(42%) 20	2	20	(44%) 22	3		1	16	(80%) 20
TOTAL	(2%) 1		(10%) 5	(10%) 5	(14%) 7	(64%) 32	(100) 50	(15%) 7	(29%) 14	(8%) 4	(12%) 6	(36%) 18	(100%) 49	(9%) 4	(4%) 2	(2%) 1	(4%) 2	(81%) 37	(100%) 46	(50%) 25	(50%) 25	(100%) 50	(12%) 3		(4%) 1	(84%) 21	(100%) 25

(1) VERY DIFFICUL FOR THE REALIZATION
(2) TOO EXPENSIVE
(3) NO POSSIBILLTY OF STAYING HERE FOR A LONG TIME
(4) OTHERS.

TABLE 2-4-(20) RESULT OF QUESTIONAIRE

OFFICE 02

(Q.1) KIND OF ECONOMIC ACTIVITY	(Q.2) NUMBER OF EMPLOYEES							(Q.8) APPLICATION			(Q.9) REASON FOR NOT SUBMITTING THE APPLLICATION					(Q.11) USEFUL FOR INFORMATION TRANS.				(Q.12) USING OF OTHER TRANSPORTATION				
	1-4	5-9	10-29	30-49	50-99	MORE 100	TOTAL	YES	NO	TOTAL	(1)	(2)	(3)	(4)	TOTAL	(1)	(2)	(3)	TOTAL	(1)	(2)	(3)	(4)	TOTAL
GOWERNMENT SERVICE		4	3	2	2	5	(11%) 16	2	14	(11%) 16	1	2		11	(12%) 14	15		1	(11%) 16	2	11	3		(12%) 16
AGRICULTURE/ FISHERY	1		1				(1%) 2		2	(1%) 2				2	(2%) 2	2			(1%) 2	1			1	(1%) 2
MINING / QUERRYING		1	1	2	1	1	(4%) 6	3	3	(4%) 6				3	(3%) 3	3	1	2	(4%) 6	2	4			(4%) 6
MANUFACTURING			2	1	1	1	(3%) 5	2	3	(3%) 5				3	(3%) 3	5			(3%) 5	1	2			(2%) 3
CONSTRUCTION		1	2				(2%) 3		3	(2%) 3				3	(3%) 3	2	1		(2%) 3		3			(2%) 3
COMMERCE	3	9	14	12	6	1	(23%) 35	15	20	(23%) 35	4	4	1	11	(18%) 20	32	1	2	(23%) 35	9	20	2	3	(25%) 34
TRANSPORTATION		1	4	1	1	2	(6%) 9	4	5	(6%) 9	1	1		3	(4%) 5	8	1		(6%) 9	2	2	2	1	(5%) 7
SERVICE	15	10	14	4	4		(31%) 47	7	41	(31%) 47	6	12	2	21	(36%) 41	36	1	10	(31%) 47	13	20	6	5	(32%) 44
OTHERS	2	7	10	3	2	3	(19%) 27	5	22	(19%) 27	4	6	2	10	(16%) 22	22	1	4	(19%) 27	7	12	3	1	(17%) 23
TOTAL	(14%) 21	(22%) 33	(34%) 51	(10%) 15	(11%) 17	(9%) 13	(100%) 150	(25%) 37	75% 113	(100%) 150	(14%) 16	(22%) 25	(4%) 5	(60%) 67	(100%) 113	(83%) 125	(4%) 6	(13%) 19	(100%) 150	(27%) 37	(53%) 74	(12%) 16	(8%) 11	(100%) 138

(1) VERY DIFFICULT FOR THE REALIZATION
(2) TOO EXPENSIVE
(3) NO POSSIBILITY OF STAYING HERE FOR A LONG TIME
(4) OTHERS

(1) TELEPHONE
(2) CAR
(3) NO DIFFERENCE

(1) ALWAYS
(2) SOMETIMES
(3) VERY SELDOM
(4) NEVER.

TABLE 2-4-(21) RESULT OF QUESTIONAIRE

OFFICE 02

(Q.7) NEED OF TELEPHONE	(Q.2) NUMBER OF EMPLOYEES							(Q.3) (EXISTING) MAIN STATION						(Q.3) (EXISTING) EXTENSION						(Q.8) APPLICATION			(Q.9) REASON FOR NOT SUBMITTING APPLICATION FOR ADDITIONAL TEL.				
NUMBER OF TELEPHONE	-4	-9	-29	-49	-99	MORE 100	TOTAL	-2	-4	-6	-8	MORE 10	TOTAL	-2	-4	-6	-8	MORE 10	TOTAL	YES	NO	TOTAL	(2)	(2)	(3)	(4)	TOTAL
-2	14	16	26	6	4	3	(46%) 69	55	2				(42%) 57	15	6	2	1		(35%) 24	22	47	(46%) 69	14	14	3	16	(42%) 47
-4		2	4		2	4	(8%) 12	8	4				(9%) 12	2	1		1	2	(9%) 6	7	5	(8%) 12	1	2	1	1	(4%) 5
-6				2	3	2	(5%) 7	3	3	1			(5%) 7			1			(1%) 1	5	2	(5%) 7		1		1	(2%) 2
-8		1	1	1		1	(3%) 4	2	2				(3%) 4	1				1	(3%) 2	1	3	(3%) 4				3	(3%) 3
-10																											
MORE 10					1	2	(2%) 3	1	1			1	(2%) 3					2	(3%) 2	2	1	(2%) 3				1	(1%) 1
ENOUGH	5	13	21	4	5	5	(35%) 53	42	8	3			(38%) 53	19	5	1	4	4	(49%) 33		53	(35%) 53	3	6	1	43	(46%) 53
OTHERS	1			1			(1%) 2	2					(1%) 2								2	(1%) 2		1		1	(2%) 2
TOTAL	(13%) 20	(21%) 32	(35%) 52	(9%) 14	(10%) 15	(12%) 17	(100%) 150	(81%) 113	(15%) 20	(3%) 4		(1%) 1	(100%) 138	(54%) 37	(18%) 12	(6%) 4	(9%) 6	(13%) 9	(100%) 68	(25%) 37	(75%) 113	(100%) 150	(16%) 18	(21%) 24	(4%) 5	(58%) 66	(100%) 113

(1) VERY DIFFICULT FOR THE REALIZATION
(2) TOO EXPENSIVE
(3) NO POSSIBILITY OF STAYING HERE FOR A LENG TIME
(4) OTHERS

"Reference" **QUESTIONNAIRE**

We have been requested by the Government of Indonesia to conduct a survey on the telephone demand in Indonesia and shall appreciate your answers to the questions listed below. The purpose of this survey is to compile statistical data, and your answers will be held in the strictest confidence.

Thank you very much for your cooperation.

.....

Questionnaire I (R pattern area)

1. Do you have a telephone?
   (1.1) Yes. (1.2) No.
2. Please let us know of your plan to purchase a telephone.
   (2.1) I want to purchase a telephone within one year.
   (2.2) I want to purchase a telephone within two years.
   (2.3) I want to purchase a telephone in the future.
   (2.4) I do not want to purchase a telephone even in the future.
3. What is the main purpose for needing a telephone?
   (3.1) For business use.
   (3.2) For communication with friends.
   (3.3) Convenient for reservation at hotel, airline and so on.
   (3.4) Convenient for communicating with family from the office.
   (3.5) Other reasons.
4. What is the main reason for not applying for the telephone subscription?
   (4.1) It is too expensive.
   (4.2) No telephone installed even when subscription is applied for.
   (4.3) No use for a telephone.
   (4.4) Letter and telegram are sufficient.
   (4.5) Public telephone is available.
   (4.6) Talking directly by walking over.
   (4.7) No connection during busy hour.
   (4.8) Will not reside here long.
   (4.9) No telephone at friend's home.
   (4.10) Other eaasons.
5. Do you have any complaints about your telephone?
   (5.1) No. (5.2) Yes.
6. What kind of complaints?
   (6.1) Few telephones.
   (6.2) Bad connection.

(6.3) Poor maintenance.

(6.4) Bad transmission

(6.5) No telephone installation even though application was made a long time ago.

(6.6) Other reasons.

7. What kind of durable consumer's goods does your family have?

(7.1)	Radio	(7.8)	Water heater
(7.2)	Stereo & tape recorder)	(7.9)	Gas cooker
(7.3)	T.V.	(7.10)	Electric washing machine
(7.4)	Camera	(7.11)	Piano
(7.5)	Electric fan	(7.12)	Car
(7.6)	Air conditioner	(7.13)	Motorcycle
(7.7)	Refrigerator	(7.14)	Bicycle

8. What kind of facilities do you have in your house?

(8.1)	Running water	(8.3)	Gas
(8.2)	Well pump	(8.4)	Electricity

9. In question 7 on durable consumer's goods, which item do you wish to purchase in the future? (Indicate only one)

10. What is the occupation of the head of the family?

(10.1)	Senior Government employee	(10.2)	Middle
(10.2)	Middle Government employee	(10.6)	Pharmacist
(10.3)	Entrepreneur	(10.7)	Others
(10.4)	Foreign company employee		

11. How much is the family income per month?

(11.1)	Under Rp. 2,000	(11.7)	Rp. 12,001 – 14,000
(11.2)	Rp. 2,001 – 4,000	(11.8)	Rp. 14,001 – 20,000
(11.3)	Rp. 4,001 – 6,000	(11.9)	Rp. 20,001 – 30,000
(11.4)	Rp. 6,001 – 8,000	(11.10)	Rp. 30,001 – 50,000
(11.5)	Rp. 8,001 – 10,000	(11.11)	Rp. 50,001 – 70,000
(11.6)	Rp. 10,001 – 12,000	(11.12)	More than Rp. 70,000

12. What kind of dwelling do you live in?

a.

(12.1)	Privately owned	(12.4)	Government house
(12.2)	Rented	(12.5)	Others
(12.3)	Company house		

b.

(12.1)	For residence only
(12.2)	Shop or office
(12.3)	Combination of house and shop

13. How many rooms do you have in your house?

(13.1)	Bedroom	No. of rooms	:
(13.2)	Living room	"	:
(13.3)	Dining room	"	:
(13.4)	Kitchen	"	:
(13.5)	Bathroom/toilet	"	:
(13.6)	Storeroom	"	:
(13.7)	Garage	No.	:
(13.8)	Other rooms	No. of rooms	:

QUESTIONNAIRE II (S Pattern Area)

1. What kind of business is your shop engaged in?

(1.1)	Wholesale	(1.3)	Service
(1.2)	Retail	(1.4)	Others

2. How many persons are engaged in this office?

_____ persons

3. Do you have a telephone?

(3.1)	Yes.	(3.2)	No.

4. How much is the telephone charge of your office? Please indicate the charge for the latest month.

Rp. _____

5. Do you plan to purchase a telephone?
   - (5.1) I want to purchase a telephone within one year.
   - (5.2) I want to purchase a telephone within two years.
   - (5.3) I want to purchase a telephone in the future.
   - (5.4) I do not want to purchase a telephone even in the future.
6. Do you have any complaints about your telephone?

(6.1)	No.	(6.2)	Yes.

7. What kind of complaints or requests do you have?
   - (7.1) Shortage of telephones
   - (7.2) Bad connection
   - (7.3) Poor maintenance
   - (7.4) Bad transmission
   - (7.5) Telephone not installed in spite of submitting an application a long time ago
   - (7.6) Other reasons:
8. What is the main reason for needing a telephone?
   - (8.1) Convenient for getting orders from customers.
   - (8.2) Convenient for placing orders.

(8.3) Convenient for communicating with friends.

(8.4) Convenient for making reservation at hotel, airline, etc.

(8.5) Other reasons:

9. What is the main reason for not submitting an application for telephone?

(9.1) Too expensive.

(9.2) Delay in installation or no installation after the application has been submitted.

(9.3) Motor cars are available.

(9.4) Letters and telegrams are sufficient.

(9.5) No telephone at friend's house/office.

(9.6) No urgent business which requires the use of a telephone.

QUESTIONNAIRE III (O Pattern Area)

1. What kind of business is your company engaged in?

(1.1) Government service
(1.2) Agriculture/Fishery
(1.3) Mining
(1.4) Manufacturing
(1.5) Construction
(1.6) Commerce
(1.7) Transportation
(1.8) Services
(1.9) Others

2. How many persons are engaged in this company?

_____ persons

3. How many telephones are installed in this company?

_____ sets

4. How much is the monthly telephone charge of this company?

Please indicate the charge for the latest month.

Rp. _____

5. Do you have any complaints about your telephone?

(5.1) No. (5.2) Yes.

6. What kind of complaint or request do you have about your telephone?

(6.1) Shortage of telephones

(6.2) Bad connection

(6.3) Poor maintenance

(6.4) Bad transmission

(6.5) Telephone not installed in spite of submitting an application a long time ago.

(6.6) Others

7. How many more main telephones do you need?

_____

8. Have you already submitted an application for additional telephones?

(8.1) Yes. (8.2) No.

9. What is the main reason for not submitting the application?

(9.1) Telephone will not be installed even if the application is submitted.

(9.2) Too expensive.

(9.3) Do no intend to stay here long.

(9.4) Others.

10. How many telephones does your company need?

(10.1) 1 set for 1 person (10.3) 1 set for 3 persons

(10.2) 1 set for 2 persons (10.4) set for persons

11. Which is more convenient for information transmission, the telephone or the motor car?

(11.1) Telephone (11.3) No difference

(11.2) Motor car

12. Do you use other means when the line cannot be connected?

(12.1) Always.

(12.2) Very often.;

(12.3) Very seldom

(12.4) Never.

2.5 Telephone Demand Forecast (Macroscopic Demand Forecast)

2.5.1 Outline of Telephone Demand Forecast

The purpose of the telephone demand forecast presented here is to provide basic data for the short-term and long-term network expansion programs in Jakarta. The short-term plan means the 2nd Five-Year Plan, and the long-term plan covers the 20 year period up to 1993. On the basis of this demand forecast, the office establishment plan, numbering plan, demand fulfillment plan, switching expansion plan, outside plant expansion plan, etc. will be systematically prepared by careful observation of the mutual relation of each plan. This demand forecast is not only for Jakarta but covers the whole of Indonesia. In particular, the demand in the subdistricts of Jakarta was calculated for the outside plant expansion plan.

2.5.2 Macroscopic Demand Forecast

Forecast methods applied are as under.

(1) Time series extrapolation method.

(2) Correlation model between economic indices.

(3) Possible expenditure amount of households.

(4) Ratio of GDP invested in telecommunications.

2.5.3 Prerequisite for Demand Forecast

Table 2.5.(1) Prerequisit Conditions

Item	Prerequisit conditions
Indonesia population	1974 : 126.0 (million) 1993 201 (million) Annual growth factor 2.37% Central Statistic
Jakarta population	1974 : 5,484 (thou.) 1993 : 13,850 (thou.) Census and Statistic Dept. of DKI
Jakarta households	1974 : 1,097 (thou.) 1993 : 2,770 (thou.) Estimate based on the supposition that average household member is 5
Jakarta employees	1974 : 1,570 (thou.) 1993 : 3,740 (thou.) DKI projection, Central Bureau of Statistics
Rp. per US one dollar in 1969	One US dollar = 326 Rp.
GDP	2,718 billion at constant 1969 price growth factor 8% after 1971
N.I	2,372 billion Rp. at constant 1969 price growth factors 8% after 1971
Jakarta area	According to Fig. 2.1.(5)

2.5.4 Forecast according to Time Series Extrapolation Method

This forecasting method is very effective in the case when the trend in the past is presumed to continue in the future, and for this reason is generally used in making short-term forecasts. The demerits of this method is that the policy factors such as charging rates, change in quality of service, etc. are not given too much consideration and that there is a lack of persuasive power in the long-term plan.

In the present time series extrapolation method, since the population spread rate for telephones will increase in proportion to the development of economy, the following formula has been assumed.

$$Y = D/N = ab^t$$

D = Number of telephone demand

N = Population

a,b = Coefficient

So, the coefficient of exponential equation (a,b) will be obtained by applying the least square method based on past data from 1965 to 1973. The result is as follows:

$$Y = 0.4609 \times 1{,}094^{ti}$$

ti = 1 (1965)

ti = 2 (1966)

According to the above equation, the telephone demand (about 110,000) for 1978, for example, is calculated by multiplying the telephone demand rate (1.62%) and the population projection figure (6,460,000) for that year.

2.5.5 Forecast according to Correlation Model with Economic Index

(1) Forecast according to Correlation between Main Telephone Demand Density (per 100 inhabitants) and per capita GDP

The relation between the main telephone demand density (q) and the per capita GDP (x) at constant 1969 prices will become a straight line when plotted with logarithmic scales on cross-section paper. This correlation formula can be determined by the method of least squares according to the following.

$$\text{Log } q = -3.878 + 1.546 \log x_2$$

(Correlation coefficient $\gamma = 0.967$)

q = Main telephone demand density (per 100 inhabitants)

x_2 = GDP per capita (Unit: U.S. dollars)

By using the population growth factor of 2.37% as quoted from the data of the Central Statistic Bureau and the NI actual growth factor of 8% of the economic policy

based on 1971, the per capita GDP for 1978 will be 140 U.S. dollars. Therefore, the main telephone density in 1978 will be 0.2 per 100 inhabitants and the total telephone density in Indonesia will be about 283,000.

(2) Forecast according to Correlation between Main Telephone Demand Density (per 100 inhabitants) and per capita NI

The relation between the main telephone density (q) and the per capita NI (x) at constant 1969 prices will become a straight line when plotted with logarithmic scales on cross-section paper. This correlation formula can be determined by the method of least squares according to the following.

$$\text{Log } q \simeq -3.680 + 1.513 \log x_3$$

(Correlation coefficient $\gamma = 0.978$)

q = Main telephone demand density (per 100 inhabitants)

x_3 = NI per capita (Unit: U.S. dollars)

By using the population growth factor of 2.37% as quoted from the data of the Central Statistic Bureau and the NI actual growth factor of 8% of the economic policy based on 1971, the per capita NI for 1978 will be 100 U.S. dollars. Therefore, the main telephone demand density per 100 inhabitants will be 0.22 and the total telephone density in Indonesia will be approximately 310,000.

Both the GDP and the NI are based on nationwide data and this type of forecast is used for estimating the telephone demand for the whole country. Therefore, it is needless to say that this method cannot directly be applied in forecasting the demand for the various cities. In order to forecast the telephone demand in the large cities, a forecast of the concentration ratio in the large cities against the national demand must be made.

2.5.6 Telephone Concentration Rate to Jakarta

As can be seen in Fig. 2.5.4.(14), the telephone concentration rate to Jakarta has increased year by year. However, this is due to the economic difference of the areas and when the area difference is corrected in the future and the GDP increases, it is presumed that the telephone concentration rate and the population concentration rate will become closer. [Refer to Fig. 2.5.(15).]

Therefore, the telephone concentration rate can be expressed through the correlation between the population concentration rate and per capita GDP.

$$TCR = f(PCR, G)$$

TCR : Telephone concentration rate = Y

PCR : Population concentration rate = X_1

G : per capita GDP = X_2 (Unit: U.S. dollars)

From Table 2.5.(14), the following correlation formula can be computed.

$$Y = 44.8 + 1.71 X_1 - 13.98 X_2/1{,}000$$

This formula means that telephone concentration rate will increase in proportion to the population concentration rate but will decrease in invert proportion to the per capita GDP. As can be seen from Fig. 2.5.(17), the telephone concentration rate of developed countries is getting closer to the population concentration rate, and the telephone concentration rate in developing countries tends to be remarkably higher than the population con-concentration rate.

By forecasting the population concentration rate and the per capita GDP, the telephone concentration rate of Jakarta can be calculated by using the above formula. The calculation results are in the following.

Table 2.5.(2) Telephone Concentration Rate

Year	(X1) Population concentrative ratio (%)	(X2) Per capita GDP (US$: thou.)	(Y) Telephone concentration rate (%)	Remarks
1974	4.26	0.081	50.9	
1978	4.81	0.100	51.6	
1983	5.44	0.132	52.2	
1988	5.98	0.172	52.6	
1993	6.89	0.225	53.4	

(1 US dollar = 326 Rp. in 1969)

2.5.7 Forecast on Possible Expenditures of Households

According to the living survey (1968 – 1969) conducted by the Central Statistic Bureau, the distribution of the monthly household expenditure for living costs is 51.7% for food, 9.39% for clothing, 16.2% for housing and 23.2% for miscellaneous. Although expenditures in connection with telecommunication are included in transportation costs, it is believed that this communication expense is less than about 6.5% of the total family expenditure. If it were possible to spend 5% of the total family expenditure for telecommunications, it would mean that a minimum monthly income of 60,000 Rupiahs would be necessary to install a telephone by taking into account the monthly telephone charge of an average of 3,000 Rupiahs. Furthermore, the number of households with a monthly income of more than 60,000 Rupiahs would become 0.85% in 1969 as in Fig. 2.5.(2). Assuming

that the rate of increase in income will be 8% every year, the number of families with an income of more than 60,000 Rupiahs will be 4% in 1978. If 70% of these families with more than 60,000 Rupiahs monthly income require telephones in 1978, the number of residential telephones will increase to about 41,000 including about 5,000 telephones for foreign households. The total telephone demand can be calculated by adding the business telephones to the residential telephones.

According to the random sampling survey of the existing subscriber lines, the ratio of business telephones against the total number of telephones was 5.5% in 1973. This telephone density for business use can be calculated by the telephone density for business use against the number of secondary and tertiary employees and the correlation model of per capita GDP, as shown in Fig. 2.5.(21). The results of the interview survey show that the demand rate for business telephones is higher than that for residential telephones.

Assuming that the per capita GDP in 1993 will be about 260 U.S. dollars at constant 1969 price, the number of employees per main telephone for business use will be 16 by using Fig. 2.5.(21).

Furthermore, the number of employees in 1993 is estimated at 3,740,000 so the number of telephones for business use will be 228,000. The number of telephones for business use is equivalent to 28% of the total number of telephones in Jakarta.

Table 2.5.(3) Monthly Family Expenditure

Item	Indonesia (Jakarta)	Japan	Remarks
(1) Food	51.17 %	40.86 %	
(2) Housing	16.20	15.77	
(3) Clothing	9.39	12.38	
(4) Miscellaneous	23.24	30.94	
(4-1) medical care	3.69		
(4-2) personal care	2.47		
(4-3) education	3.84		
(4-4) recreation reading	2.23		
(4-5) transportation	6.49	5.03	
(4-6) tobacco	4.52		
TOTAL	100.00	100.00	

Note:

According to the interview survey and the actual survey on residential telephone charges, we have set the income of persons able to purchase telephones and the charges for residential telephones as follows:

(1) From Fig. 2.5.(17) of the interview survey, although about 70% of the subscribers have incomes of more than 50,000 Rupiahs, the family income is generally reported lower and we have set the monthly income of families able to have telephones at more than 60,000 Rupiahs.

(2) From Fig. 2.5.(18) of the actual survey on residential telephone charges, the monthly telephone charge of about 70% of the subscribers is within 4,000 Rupiahs. However, it would be reasonable to assume that the monthly residential telephone charge would be about 3,000 Rupiahs since low income subscribers will increase in the future and the international telephone charges which have a high ratio in the present telephone revenue will decrease.

2.5.8 Approach Based on the Ratio of Investment in Telecommunications to the GDP

This method can be considered as a telephone demand fulfilment plan rather than a demand forecast. Consequently, it differs from the telephone demand based on the requests from the customers. However, this method is desirable as a means of selection and decision from among the various forecast results. The correlation between the main telephone demand density per 100 inhabitants and the rate of GDP invested in telecommunication can be expressed in the following formula when plotted by using the data of the various countries.

$$Y = 1 - 0.7036 \times 0.673 \log x$$

Y = Ratio of investment in telecommunications to the GDP

X = Number of telephones per 100 inhabitants

In the initial stage of telephone propagation, the ratio of investment in telecommunications to the GDP is small but it is believed that as information activities get brisker along with the development of the economy, the investment ratio will increase. However, this investment ratio is largely influenced by the policy of the country and cannot be determined.

Using the above-mentioned formula, the main telephone demand density for 1978 will be forecasted as about 78,000. This figure is very low in comparison with the other methods of forecasting.

2.5.9 Conclusion

As mentioned previously, basic data such as population, number of households, number of employees, number of establishments as well as main telephone demand density,

number of waiting applicants, etc. are very important for forecasting the telephone demand. However, the accurate number on the waiting lists in the past could not be grasped. Estimation by the time series method is practical when there is little change in the past trend of social environment and with no large change in the telephone expansion plan. However, since it is expected that the telephone network in Jakarta will rapidly increase and there also are many factors for changes in city planning, the application of this method for short-term (during the second plan) will be risky. Moreover, the method of forecasting from the correlation between main telephone demand density and economic indices (GDP, NI) has the following weak points:

(1) Correlation equation is not very suitable when the per capita GDP is in the low range.

(2) Difference in the social environment among the different countries.

Therefore, for short-term forecasting, the higher estimation among the various forecast figures was applied. This was made on the presumption that the increase in demand will continue for some time to come and even if the higher estimation figures were applied, it would be a difference of about one to two years from the most suitable period and that PERUMTEL's losses would be greater through the lack of telephone facilities. Since estimated figures do not vary largely with the forecasting methods, the average figures were applied.

In conclusion, it is desirable that the forecast figures shown in Fig. 2.5.(4) be applied.

Fig. 2.5.(4) Jakarta Telephone Demand

(in thousands)

Year	1974	1975	1976	1977	1978	1983	1988	1993	
Decision value	111	121	131	142	161	285	471	816	

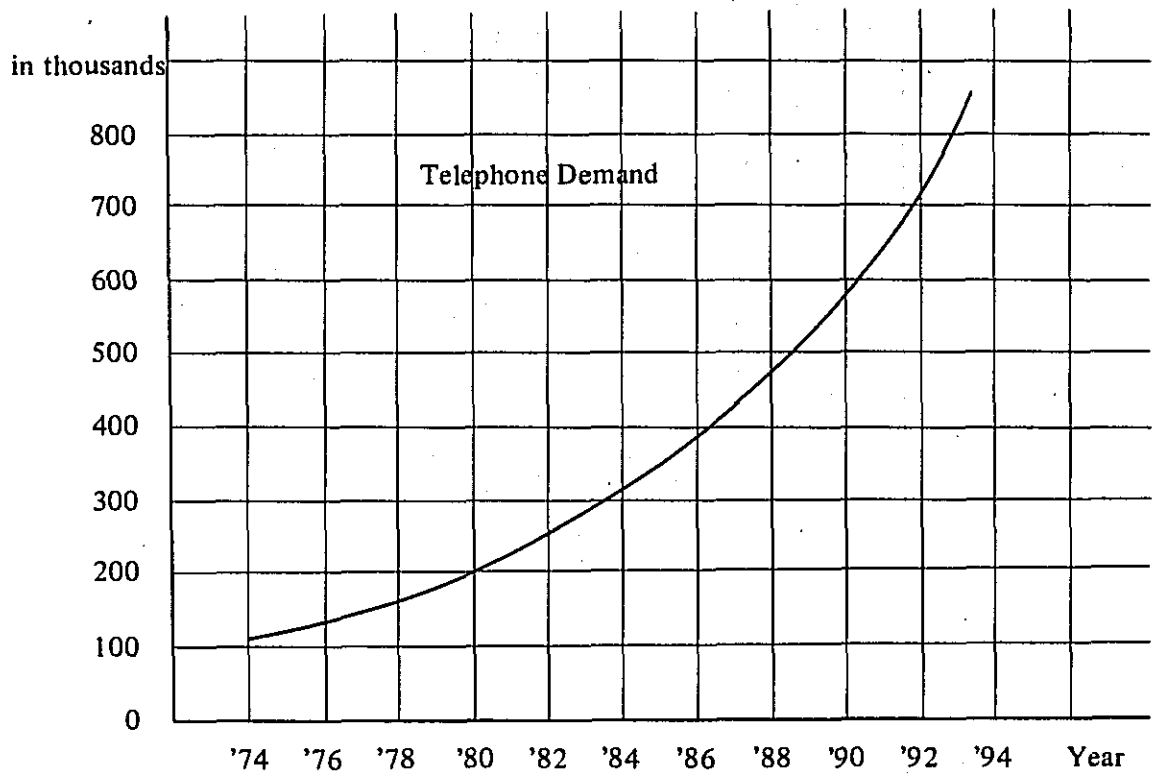


TABLE 2-5-(5) TELEPHONE DEMAND FORECAST

(UNIT : THOUSAND)

NO.	METHOD \ YEAR	1974	1975	1976	1977	1978	1983	1988	1993	REMARKS
①	TIME SERIES ANALYSIS TELEPHONE DEMAND RATIO PER 100 INHABITANTS	62	72	83	96	110	218	425	860	
②	SUBSCRIBER LINE DENSITY PER CAPITA GDP	99	108	118	135	146	258	414	731	
③	SUBSCRIBER LINE DENSITY PER CAPITA NI	111	121	131	142	161	285	471	816	
④	%POSSIBLE EXPENDITURE TO TELECOMMUNICATIONS	72	79	88	98	110	198	385	826	
⑤	%GDP INVESTED I IN TELECOMMUNICATIONS	(43)	(49)	(57)	(66)	(78)				( ) SUBSCRIBER LINE

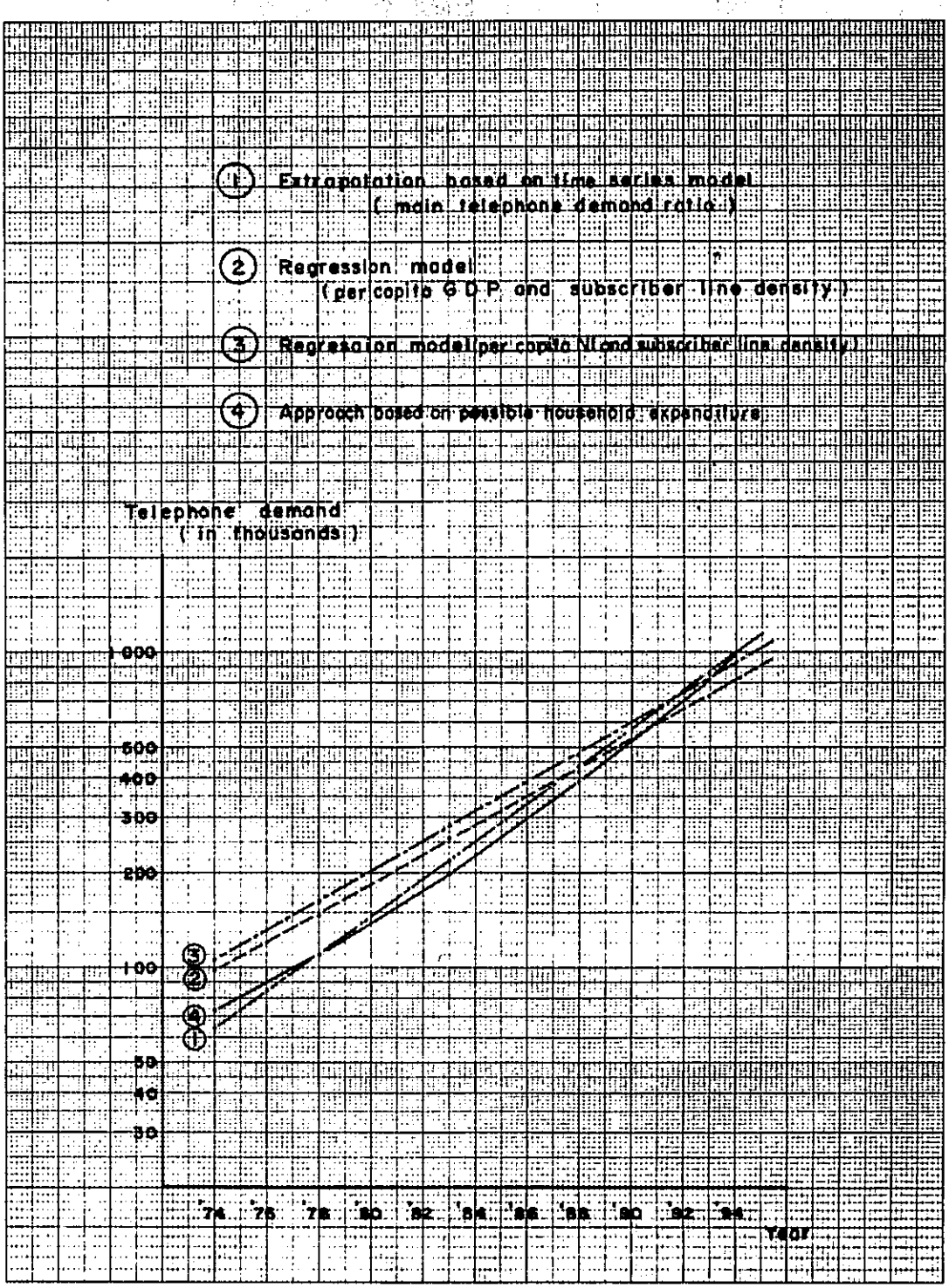


FIG. 2-5-(6) JAKARTA TELEPHONE DEMAND

TABLE 2-5-(7) FORECAST ACCORDING TO TIME SERIES EXTRAPOLATION METHOD

NO. \ YEAR	1974	1975	1976	1977	1978	1983	1988	1993	REMARKS
① JAKARTA POPULATION (HIGH PROJECTION) (IN THOUSANDS)	5,491	5,805	6,422	6,459	6,816	8,700	11,400	14,200	
② JAKRTA POPULATION (MEDIUM PROJECTION) (IN THOUSANDS)	5,484	5,801	6,122	6,450	6,794	8,600	10,700	13,850	
③ DEMAND RATE $Y = 0.4609 \times 1.094^{T}$	1.13	1.24	1.35	1.48	1.62	2.53	3.97	6.21	Y = 0.378 DEMAND RATE = TELEPHONE DEMAND / 100 IN HABITANTS
④ TELEPHONE DEMAND (① x ③)	6,600	72,000	82,700	95,600	110,400	220,100	452,600	381,800	BY HIGH PROJEC -TION
⑤ TELEPHONE DEMAND (② x ③)	63,600	72,000	82,700	95,500	110,100	217,600	424,800	860,100	BY MEDIUM PROJECTION

POPULATION PROJECTION : BY CENSUS AND STATISTIC DEPARTEMEN IF DKI

PAST STATISTIC DATA USED : (1965 - 1973)

TELEPHONE DEMND : PERUMTEL

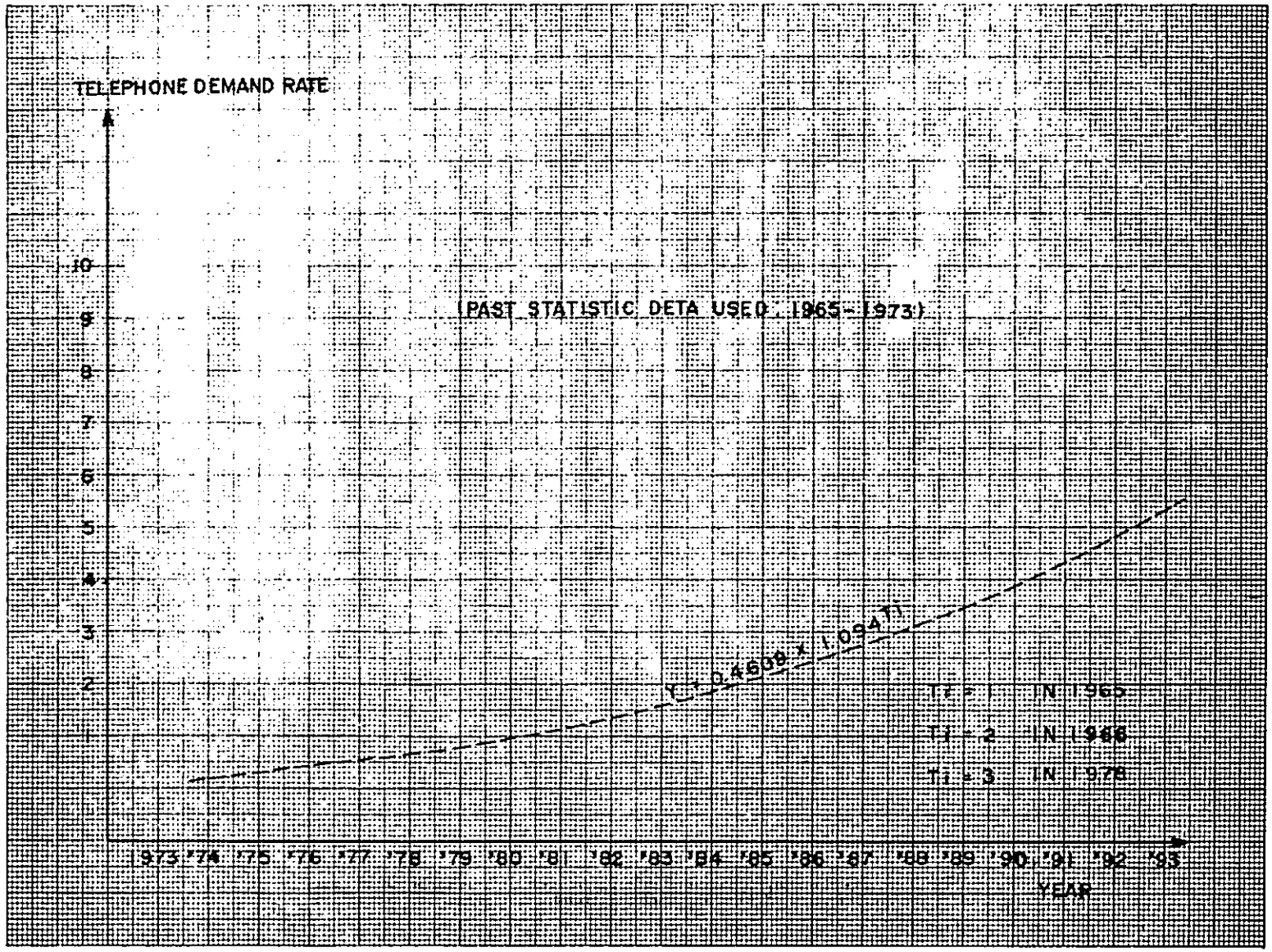


FIG. 2-5-(8) TELEPHONE DEMAND RATE

TABLE 2-5-(9) FORECAST ACCORDING TO CORRELATION MODEL WITH ECONOMIC INDEX (GDP)

NO. \ YEAR	1974	1975	1976	1977	1978	1983	1988	1993	REMARKS
① GDP (RP. BILLION) AT CONSTANT 1969 PRICE.	3,911.3	4,221.7	4,563.2	4,904.6	5,308.2	7,822.6	11,485.5	16,886.2	GROWTH FACTOR 8%
② NATIONWIDE POPULATION (IN MILLIONS)	129.0	132.1	135.1	138.3	141.5	159.1	178.9	201.0	GROWTH FACTOR 2.37%
③ PER CAPITA GDP (RP)	30,320	31,958	33,776	35,463	37,514	49,168	62,007	84,014	
④ PER CAPITA GDP (U.S. DOLLAR)	93.0	98.0	103.6	108.8	115.1	150.8	190.2	257.7	1 DOLLAR = RP. 326
⑤ DEMAND DENSITY	0.15	0.16	0.17	0.19	0.20	0.31	0.44	0.68	LOG G=-3.87 +1.546 LOGX
⑥ NATIONWIDE TELEPHONE DEMAND (②×⑤) (THOU.)	194	211	230	263	283	493	787	1,367	
⑦ TELEPHONE CONCENTRATION RATE TO JAKARTA	50.94	51.11	51.29	51.45	51.63	52.26	52.63	53.44	SEE TABLE 2-5-(2)
⑧ JAKARTA TELEPHONE DEMAND (IN. THOUSANDS)	99	108	118	135	146	258	414	731	

GDP : CENTRAL STATISTIC BUREAU (1968-1971)

(NATIONAL INCOME OF INDONESIA)

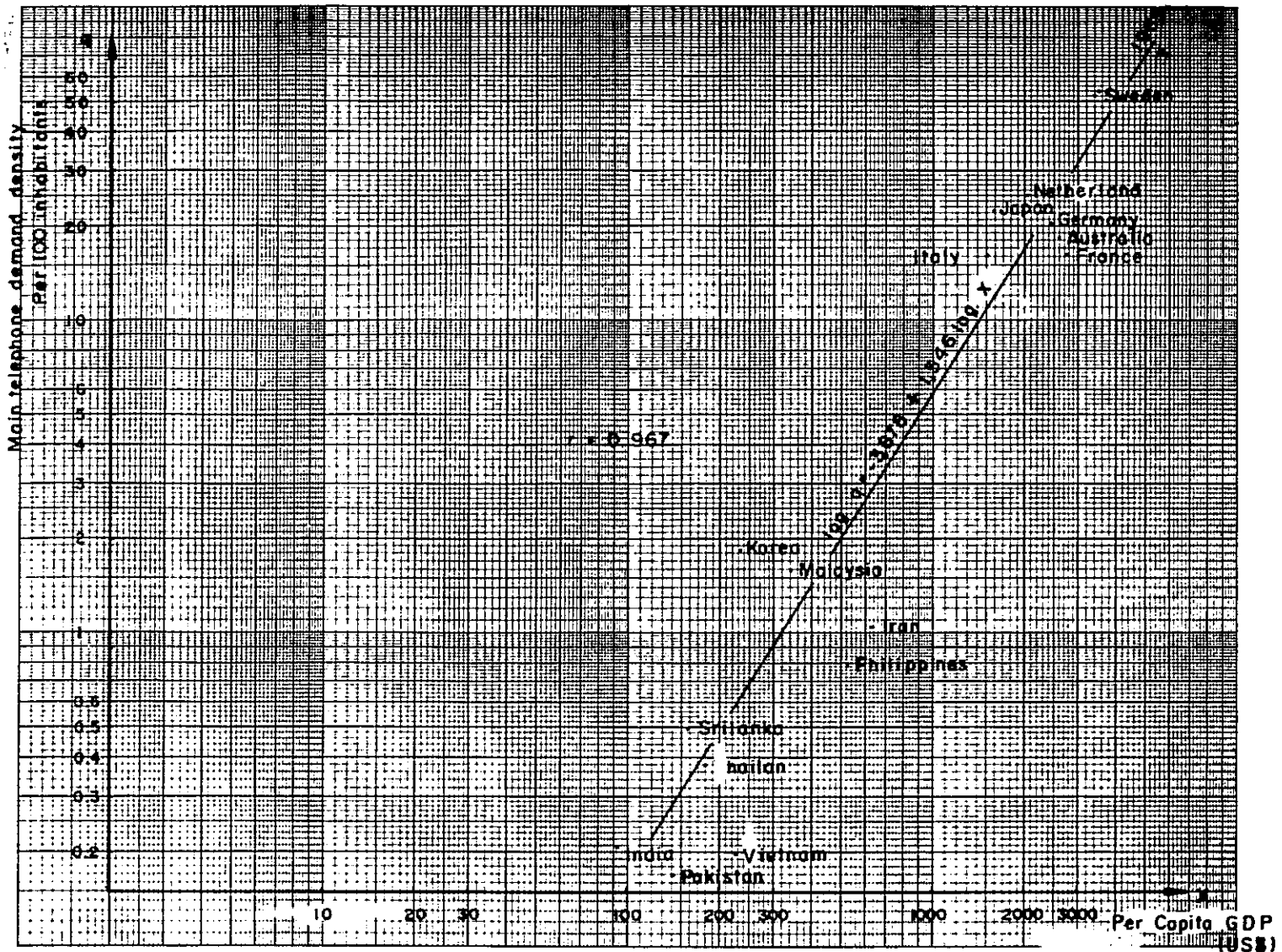


FIG. 2-5-(10) CORRELATION BETWEEN MAIN TELEPHONE DENSITY AND PER CAPITA G.D.P (1969)

TABLE 2-5-(11) FORECAST ACCODING TO CORRELETION MODEL WITH ECONOMIC INDEX (N I)

NO. \ YEAR	1973	1974	1975	1976	1977	1978	1983	1988	1993	REMARKS
① NI (RP. IN BILLION) AT CONSTANT 1969 PRICE	3,169.6	3,413.5	3,684.4	3,982.4	4,280.4	4,632.6	6,826.9	10,023.7	714,737.5	GROWTH FACTOR 8%
② NATIONWIDE POPULATION (IN MILLIONS)	126.0	129.0	132.1	135.1	138.3	141.5	159.1	178.9	201.0	CENTRAL STATISTIC
③ PER CAPITA NI (RP.)	25,156	26,461	27,891	29,477	30,953	32,739	42,909	56,030	73,321	
④ PER CAPITA NI (IN U.S. DOLLAR)	77.2	81.2	85.6	90.4	94.9	100.4	131.6	171.9	224.9	RP. 326 = 1 DOLLAR
⑤ MAIN TELPHONE DEMAND DENSITY		0.17	0.18	0.19	0.20	0.22	0.34	0.50	0.76	LOG G = − 3.680 + 1.513 LOG x
⑥ NATIONWIDE TELEPHONE DEMAND (②×⑤) (THOUSANDS)		219.3	237.6	256.7	276.6	311.3	540.9	894.5	1,527.6	
⑦ TELEPHONE CONCENTRATION RATE JAKARTA		50.94	51.11	51.29	51.45	51.63	52.62	52.63	53.44	SEE TEBLE 2-5-(2)
⑧ JAKARTA TELEPHONE DEMAND (IN THOUSANDS)		111	121	131	142	161	285	471	816	

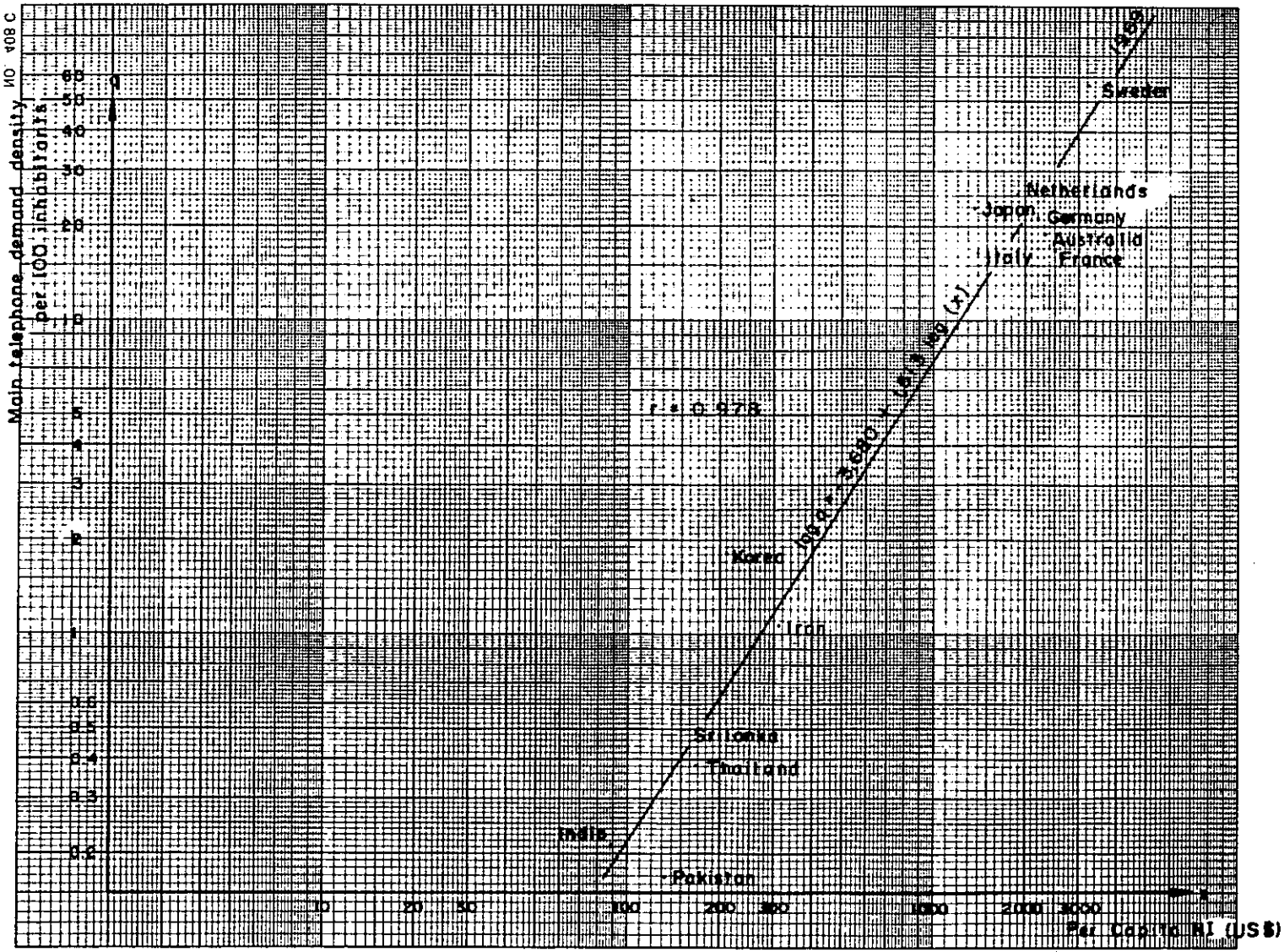


FIG. 2-5-(12) CORRELATION BETWEEN MAIN TELEPHONE DENSITY AND PER CAPITA N.I (1969)

TABLE 2-5-(13) CONCENTRTION RATE

COUNTRY	NATION WIDE POPULAION	1. CONCENTRA-TION RETE TO CAPITAL	NATIONWIDE TELEPHONE	2. CONCENTRA-TION RETA TO CAPITAL	CAPITA GDP (U.S.DOLLAR) (THOU.)
GERMANY	(THOU.) 59,130	(%) 0.40	(THOU.) 12,456	(%) 0.80	(THOU.) 2.519
UNITED STA-TES OF AMERI-CA	203,216	0. 42	114,789	0.740	4.510
AUSTRALIA	12,430	1. 10	1,334	3. 40	2.708
CANADA	20,744	1. 99	9,303	2. 70	3.473
PAKISTAN	115,370	2. 7	193	33. 70	0.144
PHILIPPINES	37,820	4. 1	294	63. 10	0.350
MALAYSIA	9,080	5. 3	167	34.40	0.347
BURMA	27,280	6.2	25	70.80	0.078
NETHERLANDS	12,950	6. 4	3,121	11. 60	2.149
JAPAN	122,930	9. 3	23,132	17. 40	1.642
SWEDEN	8,010	9.4	4,307	5. 30	3,865
VITNAM	18,150	9.6	340	87.00	0.233
FRANCE	58,940	10.4	8, 114	30. 70	2.804
IRAN	28,270	11.0	286	49. 80	0.366

WORLD TELEPHNE (1971. 1) WORLD UNION (1972)

1. CONCENTRATION RATE (%) = $\frac{\text{CAPITAL CITY POPULATION}}{\text{NATIONWIDE POPULATION}} \times 100\%$

2. CONCETRATION RATE (%) = $\frac{\text{CAPITAL CITY TELEPHONE}}{\text{NATIONWIDE TELEPHONE}} \times 100\%$

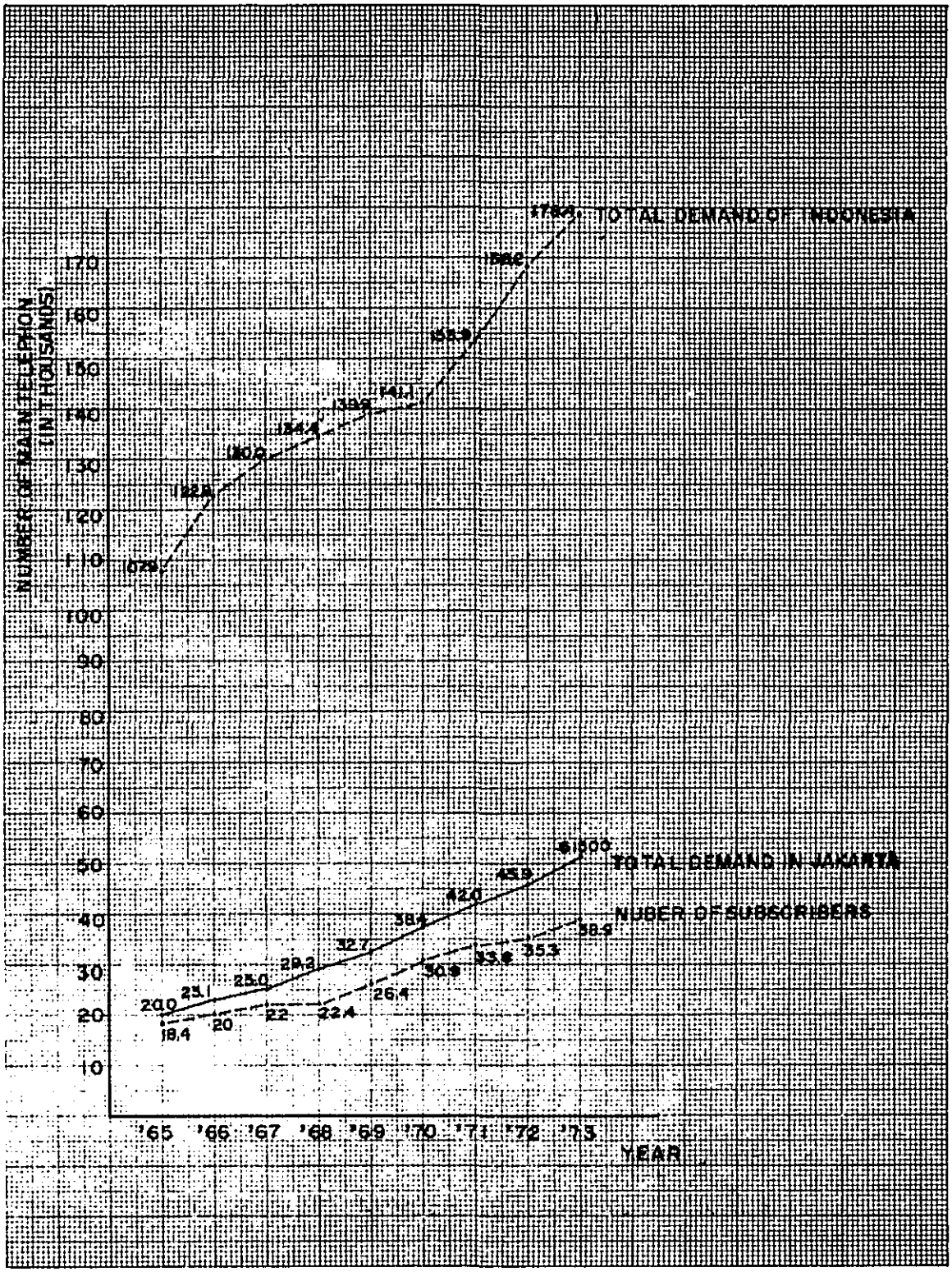


FIG. 2-5-(14) NUMBER OF MAIN TELEPHONES

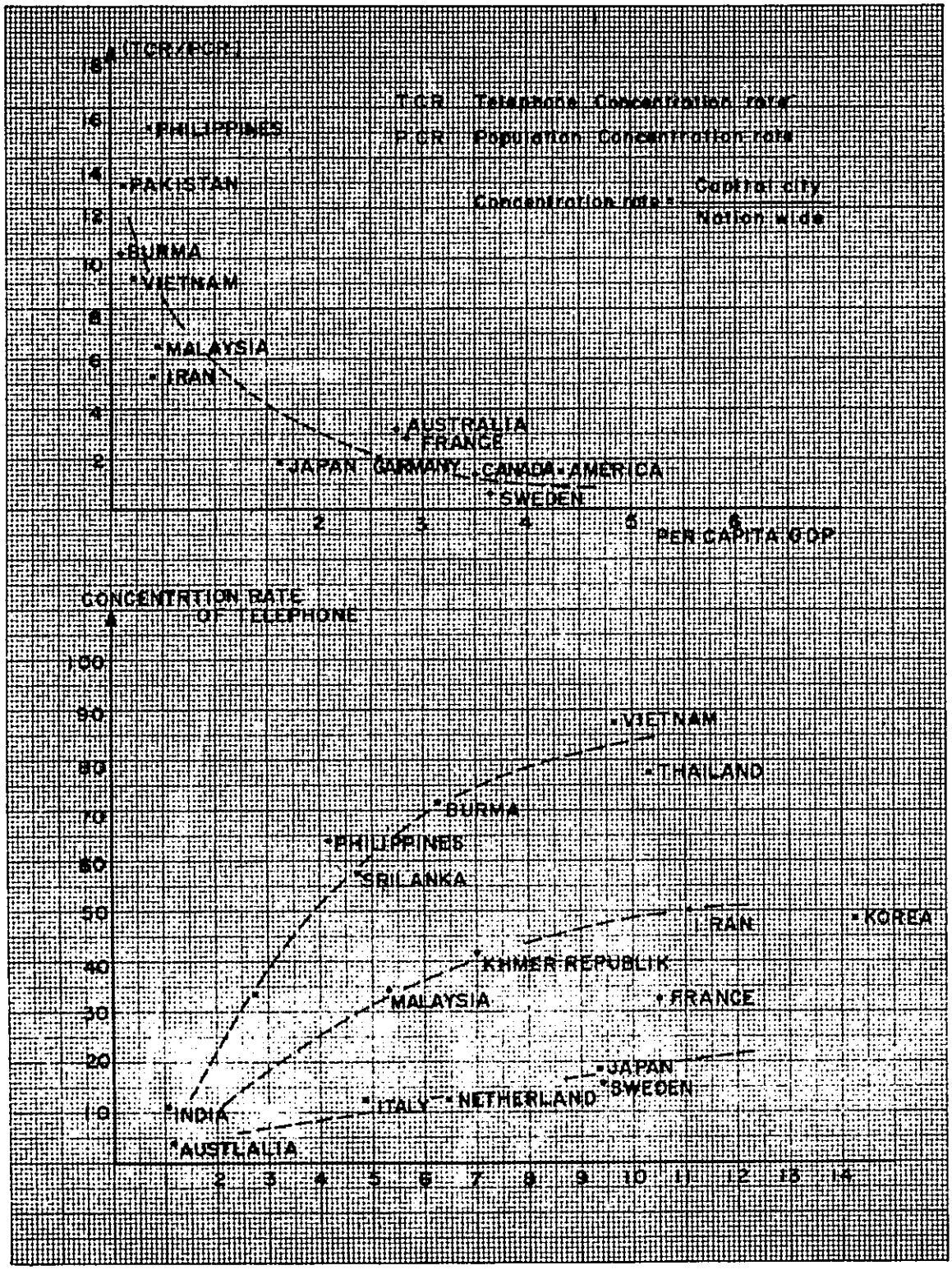

(TCR/PCR)
TCR Telephone Concentration rate
PCR Population Concentration rate
Concentration rate = Capital city / Nation wide
PHILIPPINES
PAKISTAN
BURMA
VIETNAM
MALAYSIA
IRAN
AUSTRALIA
FRANCE
JAPAN
GARMANY
CANADA
AMERICA
SWEDEN
PER CAPITA GDP
CONCENTRTION RATE OF TELEPHONE
VIETNAM
THAILAND
BURMA
PHILIPPINES
SRILANKA
IRAN
KOREA
KHMER REPUBLIK
MALAYSIA
FRANCE
JAPAN
SWEDEN
NETHERLAND
ITALY
INDIA
AUSTLALIA

FIG. 2-5-(15)

TABLE 2-5-(16) FORECAST ON POSSIBLE EXPENDITURES OF HOUSEHOLD

ITEM	T = 5 1974	T = 6 1975	T = 7 1976	T = 8 1977	T = 9 1978	T = 14 1983	T = 19 1988	T = 24 1993	REMARKS
① PRESENT VALUE FACTOR	0.681	0.630	0.583	0.540	0.500	0.340	0.232	0.158	INTEREST RATE =8% T=0 (1969)
② PRESENT VALUE OF RP. 60.000	40,860	37,800	34,480	32,400	30,000	20,400	13,920	9,480	
③ % POSSIBLE FAMILY TO BE INSTALLED TELEPHONE	(1.2) 1.6	(2.5) 1.8	(3.0) 2.1	(3.4) 2.4	(4.0) 2.8	(8.2) 5.7	(17) 11.9	(34) 23.8	(X) x 0.7 0.7 = RF
④ NUMBER OF POPULATION (IN THOUEAND)	5,490	5,800	6,122	6,458	6.805	8,650	10,700	13,850	
⑤ NUMBER OF TOTAL HOUSEHOLDS	1,098	1,160	1,224	1,292	1,361	1,730	2,140	2,770	HOUSEHOLD MEMBERS:5
⑥ NUMBER OF RESIDENTIAL HOUSEHOLDS	1,043	1,102	1,163	1,227	1,293	1,557	1,926	2,493	
⑦ RESIDENTIAL TELEPHONE (③x⑥+ 5) (THOU)	22	25	29	34	41	94	234	598	
⑧ NUMBER OF EMPOYEES (IN THOUSAND)	1,570	1,640	1,730	1,820	1,920	2,420	3,020	3,740	
⑨ DEMAND RATIO (%)	(1/31) 3.2	(1/30) 3.3	(1/29) 3.4	(1/29) 3.5	(1/28) 3.6	(1/23) 4.3	(1/20) 5.0	(1/10) 6.1	
⑩ BUSINESS TELEPHONE (⑧x⑨) (THOUS	50	54	59	64	69	104	151	228	
⑪ TOTAL (⑦+⑩) (THOUSAND)	72	79	88	98	110	198	385	826	

5 THOUSAND: TELEPHONE USED BY FOREIGNERS

RF : REALISED FACTOR

(X): See: FIG.2-5-(21)

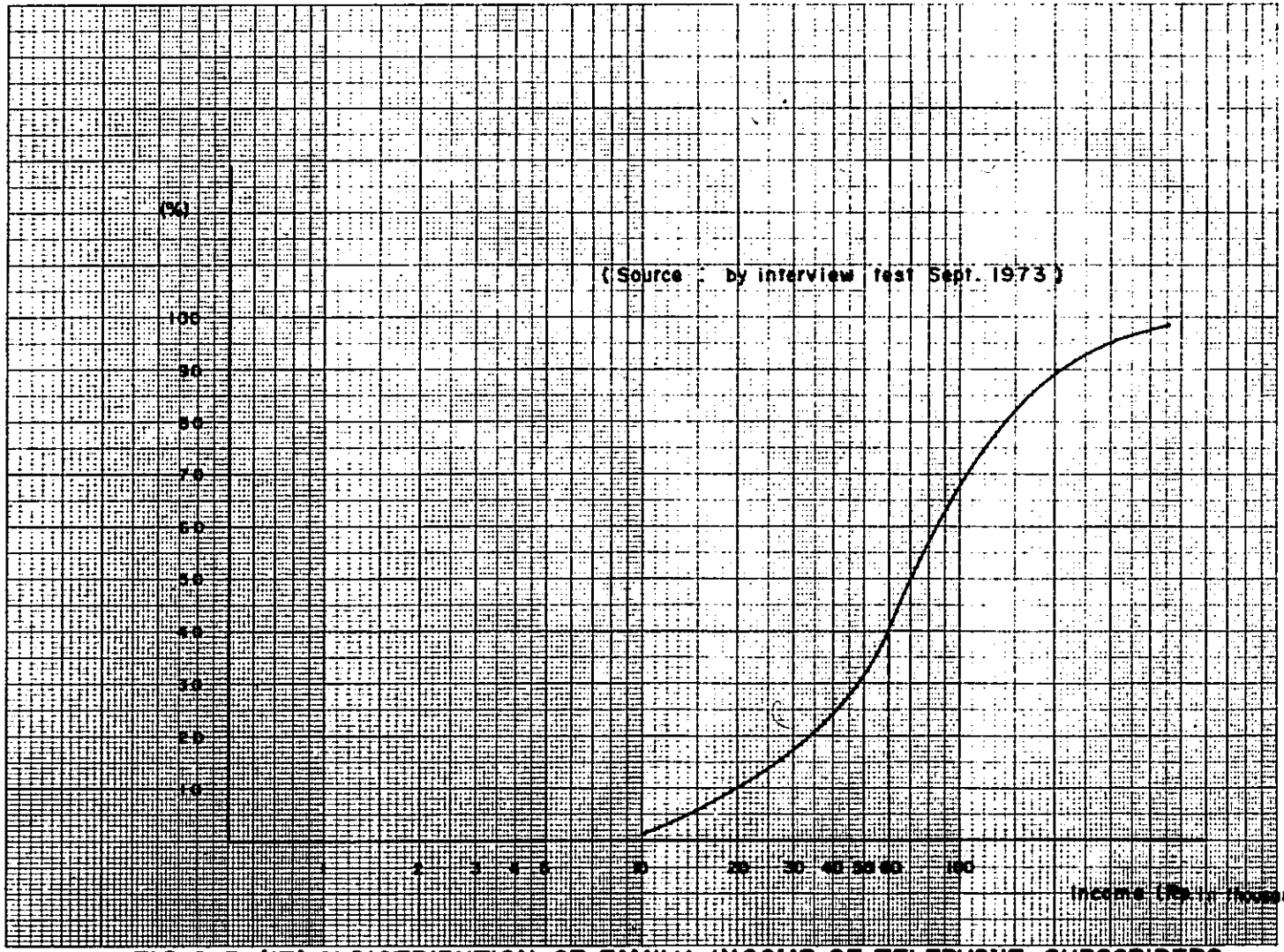


FIG. 2-5-(17) % DISTRIBUTION OF FAMILY INCOME OF TELEPHONE SUBSCRIBERS

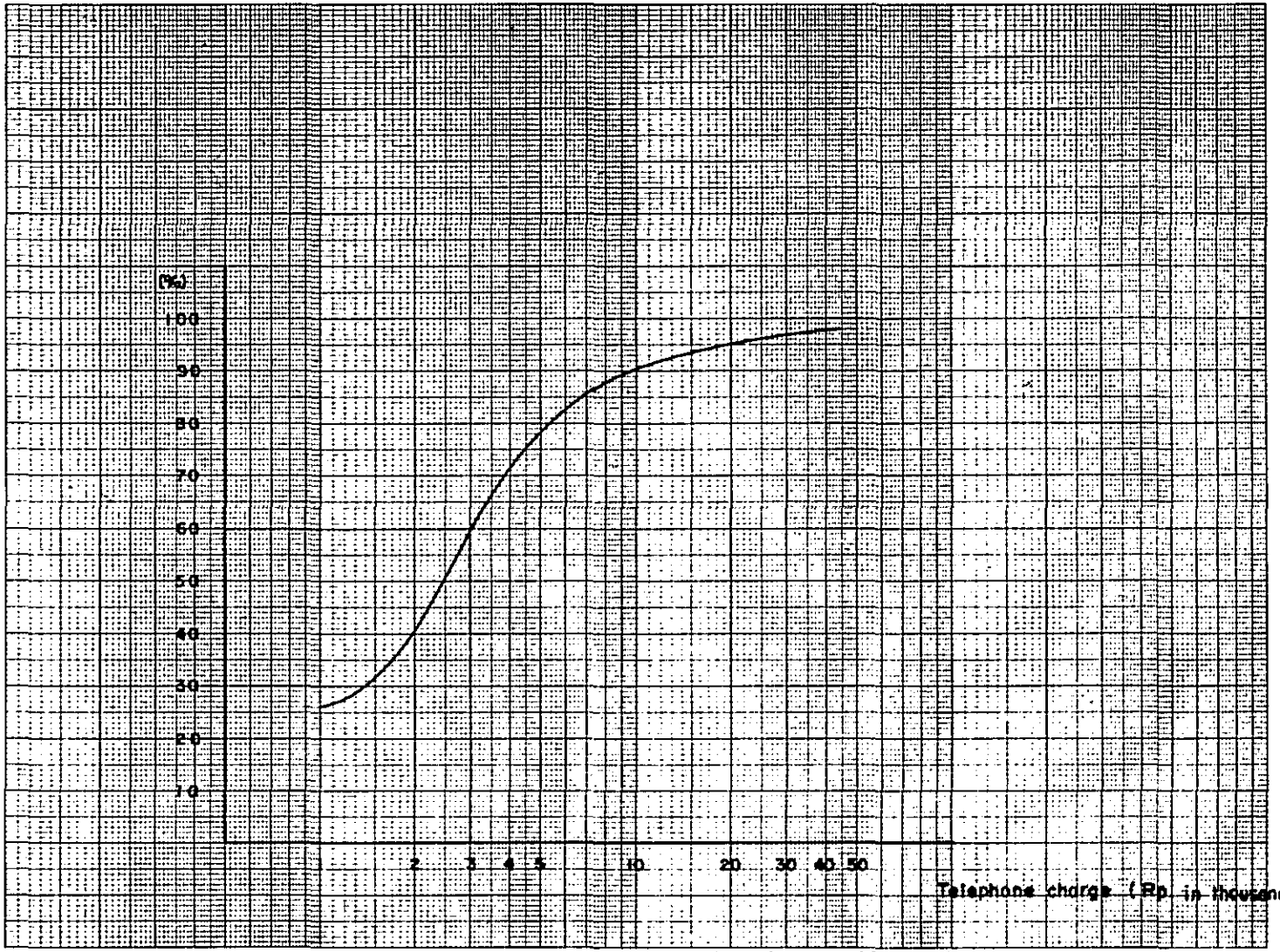


FIG. 2-5-(18) %DISTRIBUTION OF TELEPHONE CHARGE IN RESIDENCE

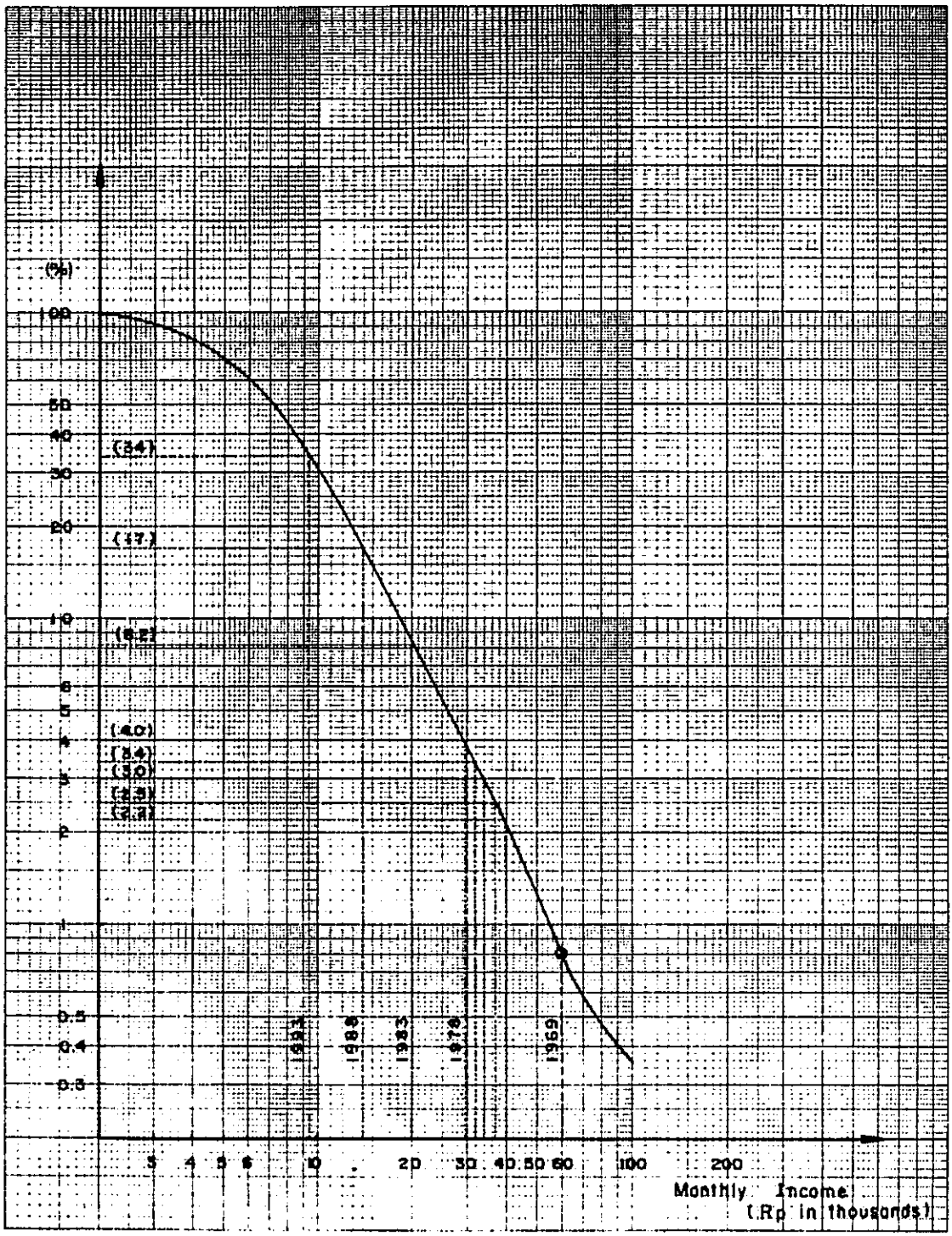


FIG. 2-5-(19) % ACCUMULATE DISTRIBUTION OF MONTHLY FAMILY INCOME IN JAKARTA (1969)

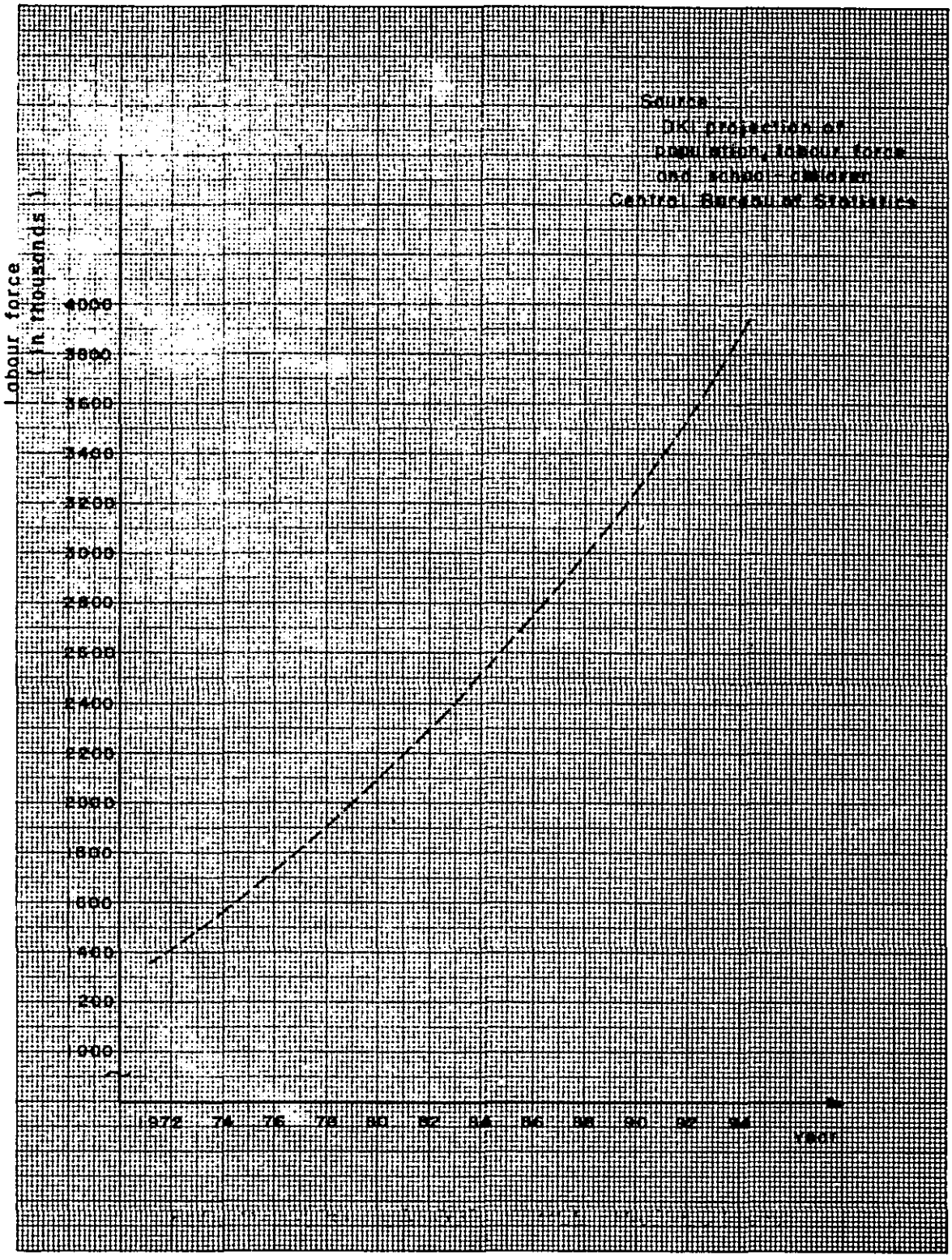


FIG. 2-5-(20) LABOUR FORCE PROJECTION

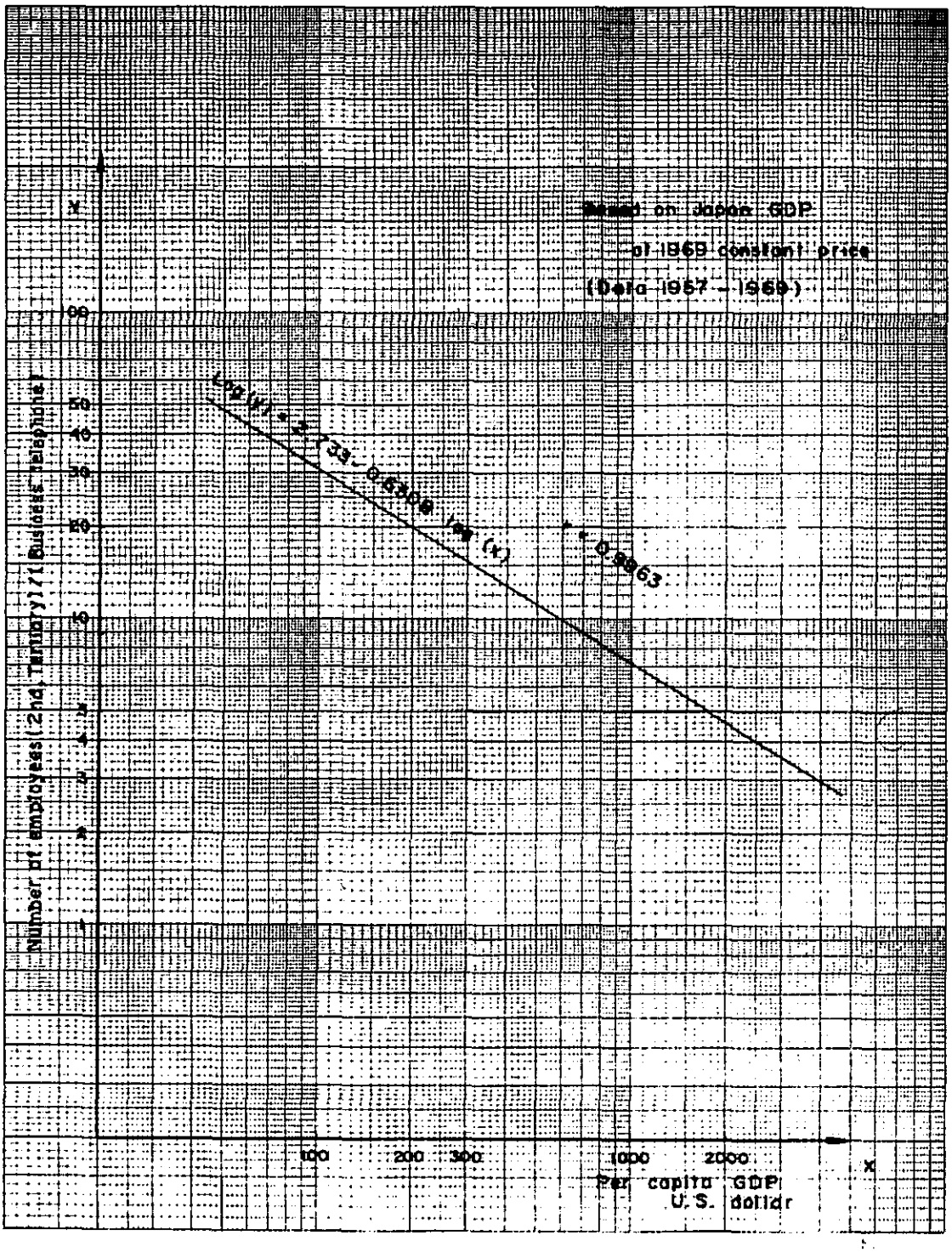


FIG. 2-5-(21) NUMBER OF EMPLOYEES(SECONDARY,TERTIARY) PER BUSINESS TELEPHONE (Y)

TABLE 2-5-(22) FORECAST BASED ON INVESTMENT RATIO FOR TELECOMUNICATIONS IN THE GDP

NO. \ YEAR	1973	1974	1975	1976	1977	1978	1983	1988	1993	REMARKS
① GDP (BILLIONS)	11.13	12.00	12.95	14.00	15.04	16.28	23.99	35.23	51.79	GROWTH FACTOR 8%
② % GDP INVESTED IN TELECOMMUNICATION		0.2	0.25	0.3	0.35	0.4				
③ TELECOMMUNICATION (①×③) 10^6		24.00	3,238	4,200	5,264	6,512				
④ TELEPHONE TO BE INSTALLED IN ITS YEAR		4,300	5,800	7,600	9,500	12,000				570×10^3 RP.
⑤ TOTAL SUBSCRIBERS	38,900	43,200	49,000	56,600	66,100	78,100				

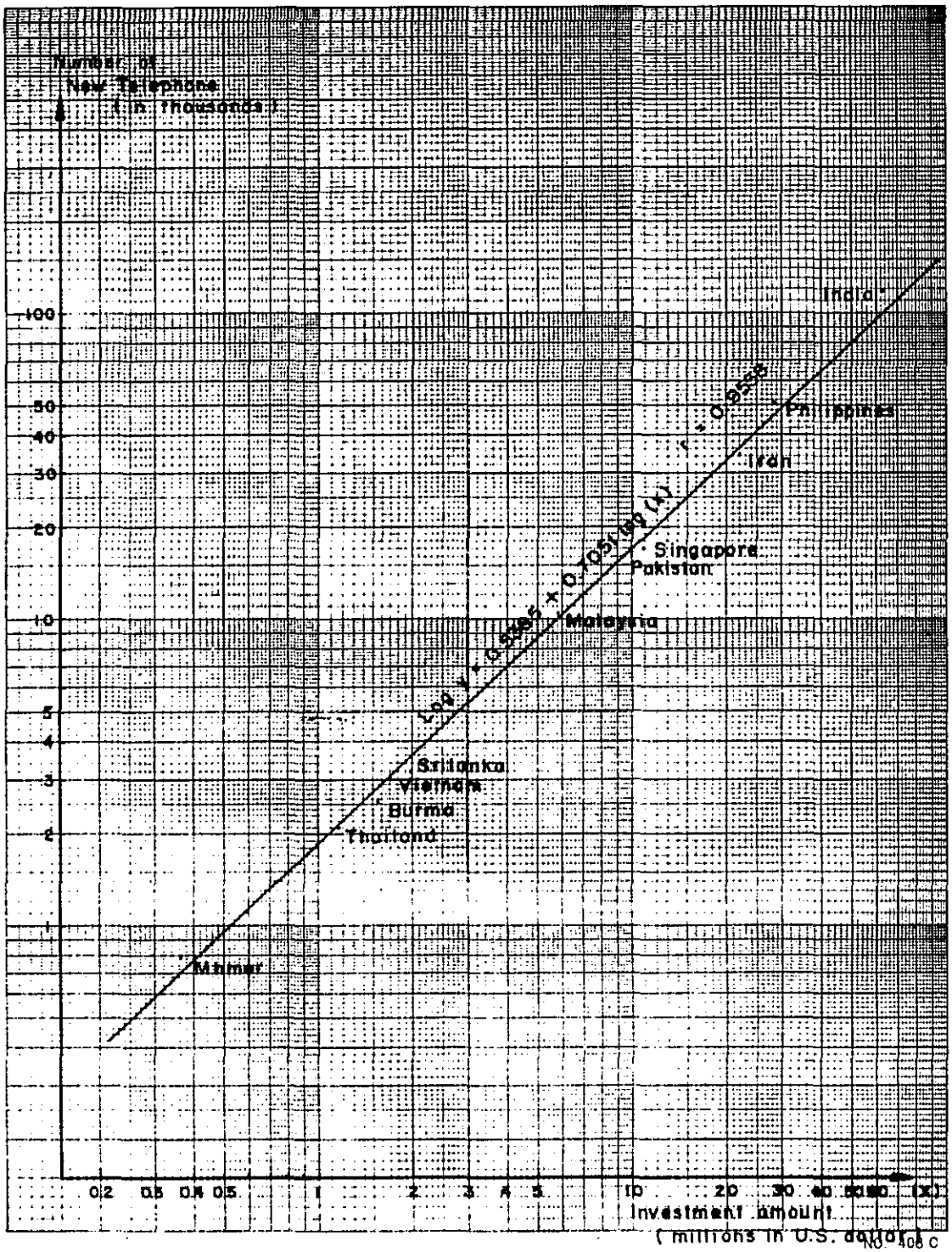

Number of
New Telephone
(in thousands)
100
50
40
30
20
10
5
4
3
2
1
0.2
0.3
0.4
0.5
1
2
3
4
5
10
20
30
40
50
80
(x)
Investment amount
(millions in U.S. dollar)
India
Philippines
Iran
Singapore
Pakistan
Malaysia
Srilanka
Vietnam
Burma
Thailand
Mainar
NO 406 C

FIG. 2-5-(23)

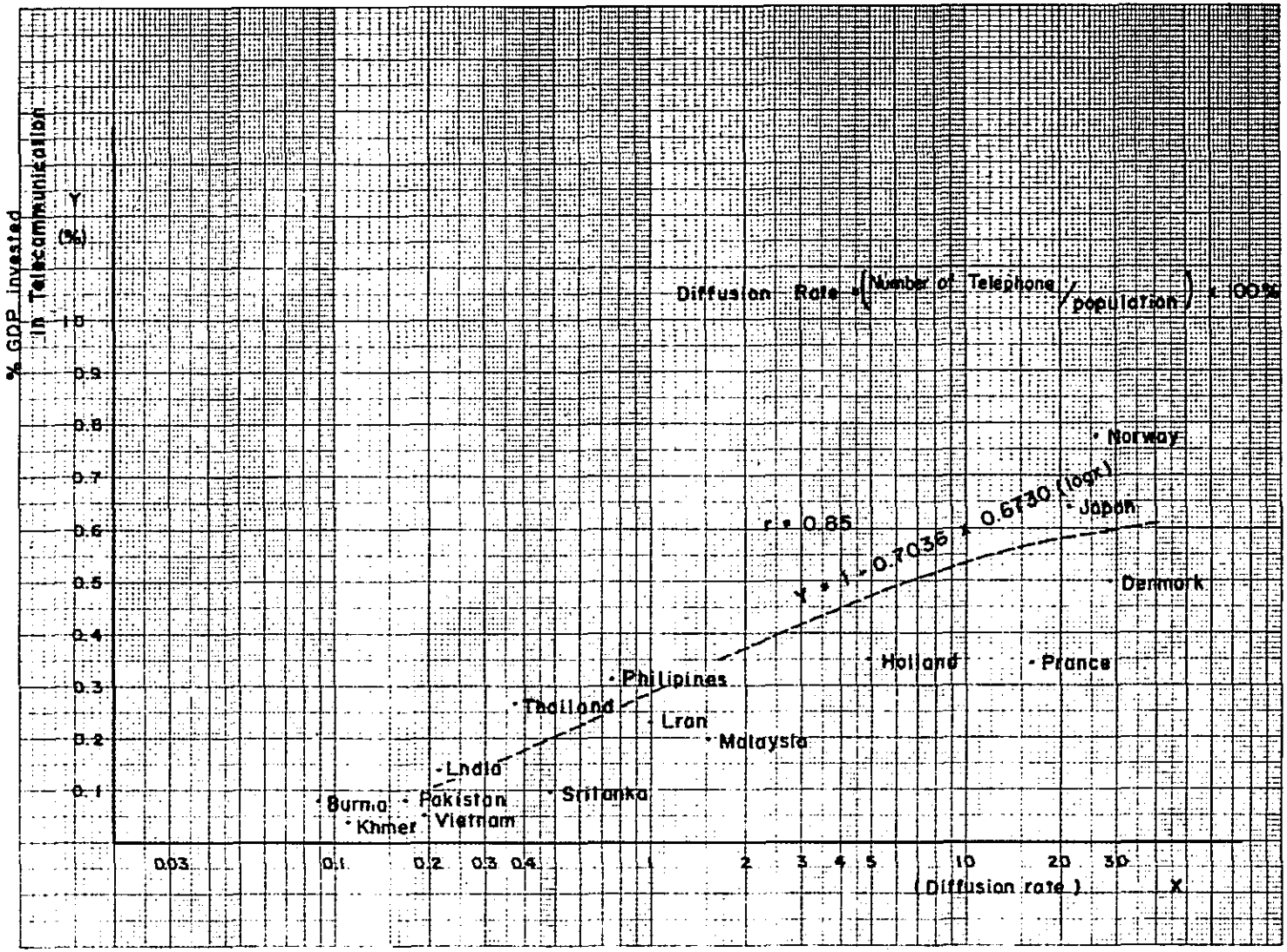


FIG. 2-5-(24) CORRELATION BETWEEN TELEPHONE DIFFUSION RATE AND % GDP INVESTED IN TELECOMMUNICATION

TABLE 2-5-(25) % GDP INVESTED IN TELECOMMUNICATION

COUNTRY	① 1969 GDP	② %GDP INVESTED IN-TELECOM	③ 1969 NEW SUB	④ ②x③ x 10^4	⑤ 1969 DIFFUSION RATE (%)
	x 10^6				
BURMA	1,895	0.082	2,574	155.4	0.09
INDIA	43,255	0.142	102,326	6,142.2	0.21
IRAN	9,392	0.230	35,920	2,160.2	1.01
KHMER REPUBLIC	834	0.042	709	35.0	0.12
KOREA	8,310	0.520	72,199	4,321.2	1.80
MALAYSIA	3,025	0.190	10,285	574.8	1.58
PAKISTAN	12,589	0.076	16,682	956.8	0.17
PHILIPPINES	8,846	0.314	52,047	2,777.6	0.78
SINGAPORE	1,415	0.720	17,083	1,018.8	5.95
SRILANKA	2,134	0.091	3,243	194.2	0.49
THAILAND	5,290	0.227	20,244	1,200.8	0.38
VIETNAM	3,305	0.050	3,032	165.3	0.19
JAPAN					22.41
FRANCE		0.33			16.1
FEDERAL REPUBLIC OF GERMANY		0.48			20.4
SWEDEN		0.52			53.7
DENMARK		0.50			30.88
NORWAY		0.79			27.02
HOLLAND		0.35			5.08

TABLE 2-5-(26) STATISTIC DATA

(UNIT : BILLION)

ITEM	1968	1969	1970	1971
GROSS DOMESTIC PRODUCT AT CURRENT MARKET PRICES	2,096.7	2,718.3	3,340.2	3,697.3
GROSS DOMESTIC PRODUCT AT CONSTANT 1960 MARKET PRICES	496.9	(100) 530.9	(107) 570.9	(114.2) 606.2
GROSS DOMESTIC PRODUCT AT CONE-ESTANT 1969 MAKET PRICES.	——	2,718.3	2,924.9	3,104.2
NATIONAL INCOME AT CURRENT FACTAR COST	1,847.9	2,372.2	2,882.9	3,159.0
NATIONAL INCOME AT CONSTANT 1960 FACTOR COST	433.1	(100) 462.8	(107) 497.7	(114.2) 528.5
NATIONAL INCOME AT CONSTANT 1969 FACTOR COST	——	2,372.2	2,550.1	2,709.1
PRIVETE CONS'N EXPENDITURE AT CURRENT MARKET PRICES.	1,854.4	2,353.9	2,692.8	2,876.4
PRIVATE CONS'N EXPENDITURE AT CONSTANT 1960 MARKET PRICES.	416.7	441.2	453.7	473.2

TABLE 2-5-(27) POPULATION PROJECTION

ITEM	1974	1975	1976	1977	1978	1983	1988	1993
WHOLE INDONESIA INDONESIA UNIVERSITY	137.4	141.3	145.2	149.0	153.5	176.2	202.3	232.2 (MILLION)
WHOLE INDONESIA CENTRAL STATISTIC	129.0	132.1	135.1	138.3	141.5	159.1	178.9	201.0 (MILLION)
PERMTEL	127.8	130.8	133.8	137.1	140.4			(MILLION)
JAKARTA HIGH PROJECTION	5,491	5,805	6,122	6,459	6,816	8,700	11,400	14,200 (THOUS.)
JAKARTA MEDIUM PROJECTION	5,490	5,800	6,122	6,458	6,805	8,650	10,700	13,850 (THOUS.)
JAKARTA LOW PROJECTION	5,484	5,800	6,122	6,450	6,794	8,600	10,000	13,500 (THOUS.)

TABLE 2-5-(28) ESTIMATION OF BASIC DATA FOR TELEPHONE DEMAND FORECAST

ITEM	1974	1975	1976	1977	1978	1983	1988	1993	REMARKS
① INDONESIA POPULATION (MILION)	129.0	132.1	135.1	138.3	141.5	159.1	178.9	201.0	
② GDP AT CONSTANT 1969 PRICES (RP)	3,911.1	4,221.7	4,563.2	4,904.6	5,308.2	7,822.6	11,485.5	16,886.8	
③ PER CAPITA GDPAT CONSTANT 1969 PRICES (RP)	30,320	31,958	33,776	35,463	37,514	49,168	62,007	84,014	
④ PER CAPITA GDP (U S $)	96.3	101.5	107.2	112.6	119.1	156.1	198.8	266.7	
⑤ NATIONAL INCOME AT CONSTANT 1969 PRICES(RP)	3,413.5	3,684.5	3,982.4	4,280.4	4,632.6	6,826.9	10,023	14,737.5	
⑥ PER EAPITA NI AT CONSTANT 1969 PRICES(RP)	26,461	27,891	29,477	30,953	32,739	42,909	56,030	73,321	
⑦ PER CAPTA NI (US $)	81.2	85.6	90.4	94.9	100.4	131.6	171.9	224.9	

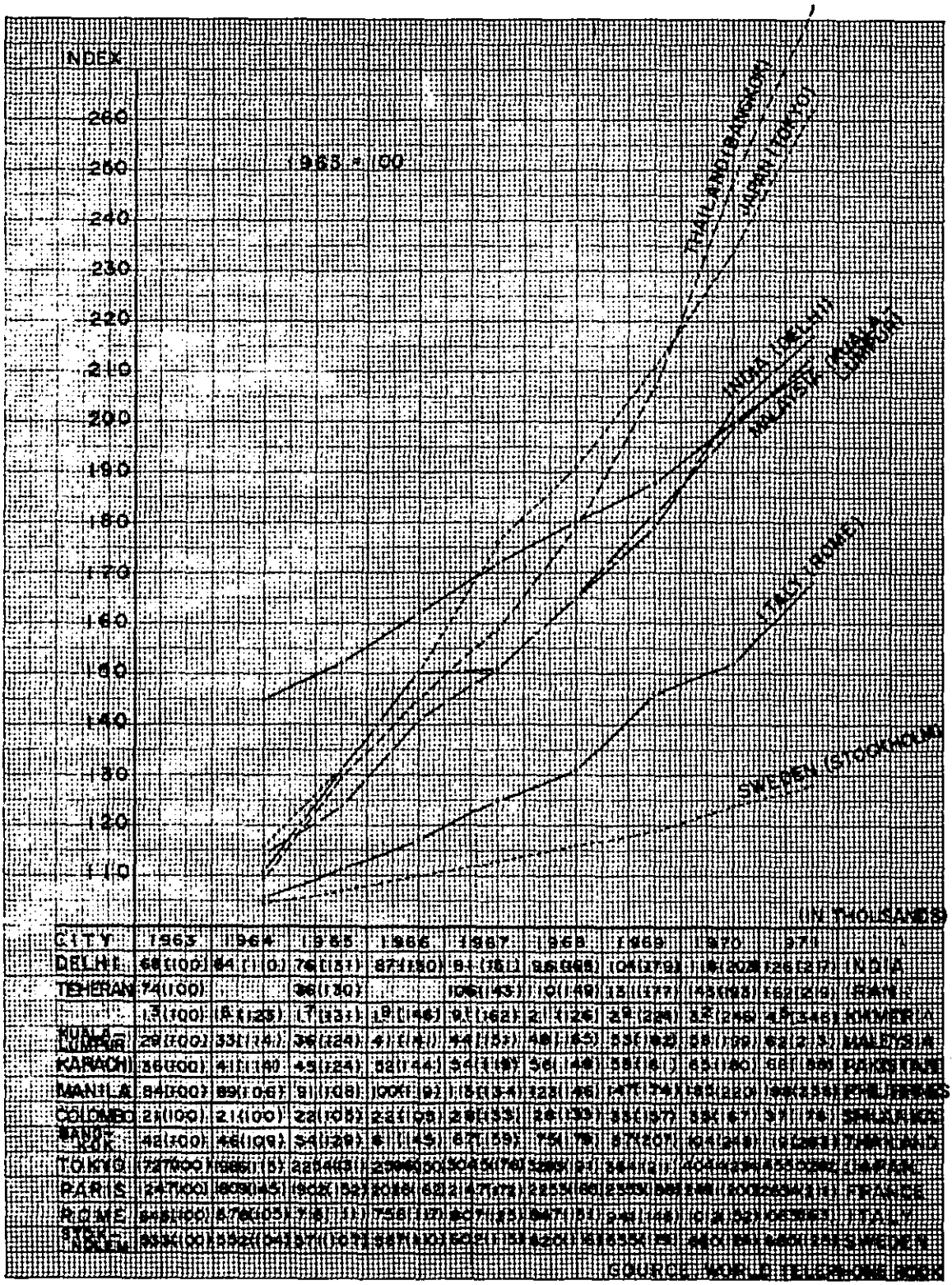
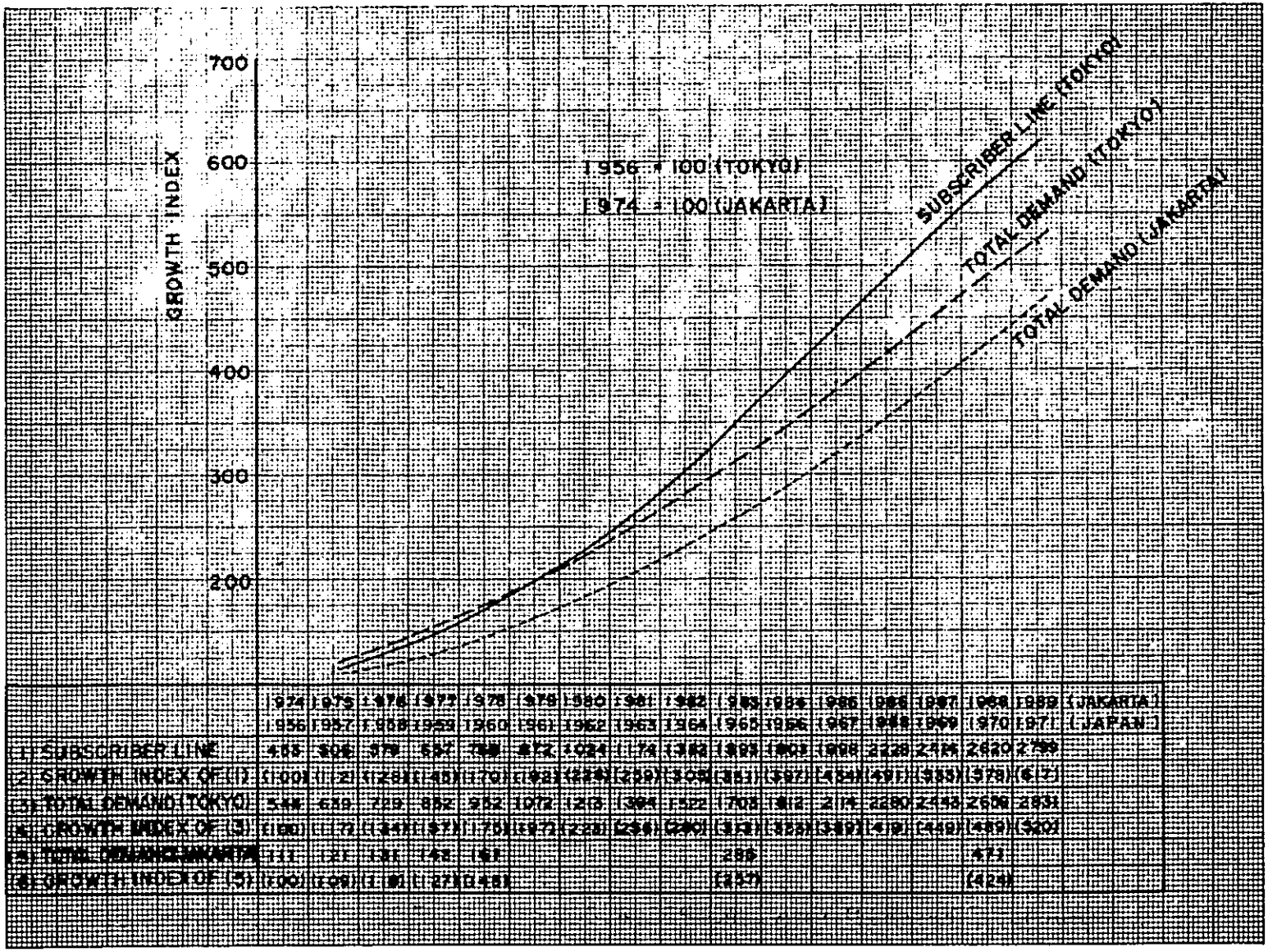


FIG. 2-5-(29) INTERNATIONAL COMPARISON OF SUBSCRIBER LINE INCREASE RATE (1936 = 100)



	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	(JAKARTA)
	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	(JAPAN)
(1) SUBSCRIBER LINE	455	506	579	657	758	872	1024	1174	1382	1595	1803	1998	2228	2444	2620	2799	
(2) GROWTH INDEX OF (1)	(100)	(111)	(128)	(145)	(167)	(192)	(225)	(258)	(304)	(351)	(397)	(439)	(491)	(537)	(576)	(615)	
(3) TOTAL DEMAND (TOKYO)	544	638	729	852	952	1072	1213	1364	1522	1708	1912	2114	2280	2443	2609	2831	
(4) GROWTH INDEX OF (3)	(100)	(117)	(134)	(157)	(175)	(197)	(223)	(251)	(280)	(314)	(352)	(389)	(419)	(449)	(480)	(520)	
(5) TOTAL DEMAND (JAKARTA)	111	121	131	142	161					286					471		
(6) GROWTH INDEX OF (5)	(100)	(109)	(118)	(128)	(145)					(257)					(424)		

FIG. 2-5-(30) INCREASE RATE OF SUBSCRIBER LINE AND TELEPHONE DEMAND