CHAPTER 3 BROADCASTING

3.1 Cost Estimation

Total budget of about 52 million US dollars is necessary for the expansion of broadcasting network of the plan. As for the initial stage of development plan up to 1990, expenditure is limited within a small amount practically, however fairly large amount of budget is necessary to implement the construction work of main stations in Mendoza and San Rafael. Accordingly, it is required to extend the life of old equipment as much as possible to save the budget and to use the saved budget for the construction of broadcasting networks.

Besides, financial investment which could be borne by the local broadcaster is limited to some extent, so public financial aid from the Government of Argentina and the province of Mendoza becomes inevitably necessary. By the reason it is expected to provide the financial aid from the public organizations concerned for the completion of;

    1) access road 2) antenna tower 3) power supply 4) site acquisition
which are the basic investment for the project.

As the future policy of private broadcaster was not released, only the tentative estimation is given. Studio equipment are not included within the scope of the study, however rough estimation is given tentatively, because it is necessary to estimate the whole project to realize the expansion of service. Cost estimation for the studio is made at the minimum scale necessary for ordinary operation.

In Table V−3−1, construction cost for national, public and education/university TV broadcasting is calculated, and in Table V−3−2, construction cost of private broadcasting is tabulated. In Table V−3−3, cost estimation is given roughly for studio equipment.

It should be noted that in the tables of cost estimation, from Table V −3−1 through Table V −3−3, tax, transportation fee, insurance, construction cost and contingency are not included because of the difference of actual contract by each broadcaster. Accordingly, only the F.O.B. price is indicated. If imported facilities are used, increase of several tenth of percentage should be taken into account.

3.2 Operation Cost

Same as in above, in Tables V −3−4, V −3−5, and V −3−6 estimated operation cost for MF, FM and TV broadcasting networks are tabulated.

3.2.1 Rental fee of program transmission lines

1) Television

Construction cost of microwave link is about 1.56 million US dollars.
From the above cost, assume that;

Fixed amount depreciation per annum· · · · · · · · · 0.0778 mil. US$

Interest (5%) · 0.0778 mil. US$

Operation cost, salary, maintenance · · · · · · · · · · 0.0778 mil. US$

Total · 0.2276 mil. US$

Then, rental fee of the microwave link per month becomes 19,000 US$, and 630 US$/day. Estimated income of each TV broadcaster are about 10,000 Austral/day for CH−7 and CH−9 and 4,000 Australs for CH−6 and the rental fee becomes too much expensive.

2) FM

Referring to the ratio of the rental fee of TV and FM in Japan, and considering the initial investment and others, it is estimated that the rental fee of stereophonic transmission line would be about half of television.

The fee is inappropriate to the present state of the province, because advertizing fee of FM is rather cheeper than that of AM. From the fact, it is required to lower the rental fee of FM transmission network politically until diffusion rate of FM receiver becomes to that of AM.

And the rental fee for the case is assumed to be about 2,000 US$/month for stereo.

3) MF

Rental fee of broad band radio program transmission line is assumed to be about 70% of FM. Then rental fee of line for one medium becomes 1,400 US$/month.

3.2.2 Operation cost of MF broadcasting

In Table V −3−4, operation cost of MF station is shown. Rental fee of program transmission line of commercial broadcasting is not included, because it depends on the policy of each broadcaster.

3.2.3 Operation cost of FM broadcasting

In Table V −3−5, operation cost of FM station is shown. As all of the equipment are fully semiconductorized, expense necessary for power supply, the maintenance and other items are only taken into account.

3.2.4 Operation cost of TV broadcasting

Same as the above, policy of the private broadcaster is not shown. Accordingly, estimation of operation cost of national TV broadcasting only is given in Table V −3−6.

Concerning the maintenance, patrol system is applied to each station to save the maintenance cost, however each cost is distributed to each station. No vacuum tube is used for the new installations.

3.2.5 Personnel expense

As it was difficult to get the personnel expenses data, the item is excluded from the operation cost although it is very important.

Table V − 3 − 1 Estimated construction cost (excl. private broadcasting)

	Prephase	First phase	Second phase	Third phase	Total
TV network	113	6,563	438		7,114
FM network		1,250	375		1,625
E/U TV network		1,380	1,500		2,880
MF network		1,000	1,000	400	2,400
Earth stn.		880	810		1,690
Teletext		630			630
Bilingual			630		630
Pub. TV			1,380	1,380	2,760
Maintenance			440	130	570
Intercom.			380		380
Data net.			380	250	630
CATV			125	375	500
Others		500	500	300	1,300
Total	113	12,203	7,958	2,835	23,109

ENTEL LINK		1,560	210	3,400	5,170

Grand total	113	13,763	8,168	6,235	28,279

(in thousand US $)

Table V - 3 - 2 Estimated construction cost of private broadcasters

	First phase	Second phase	Third phase	Total
TV network	2,200	1,100		3,300
FM network	930	930	450	2,310
MF network	410	160	1,200	1,770
Teletext		1,260	630	1,890
Billingual		1,260	630	1,890
Others	3,540	4,710	2,910	11,160

(in thousand US$)

Note: Concerning the construction schedule of private broadcasters, there are many unknown factors. In above table, only a tentative estimation is given.

Table V - 3 - 3 Estimated construction cost of studio facilities

VHF 4 stations (TV)	1,81	in Mendoza
UHF 2 stations (TV)	1,5	ditto
VHF 4 stations (TV)	2,38	in San Rafael
UHF 2 stations (TV)	1,5	ditto
FM 4 stations	0,25	in Mendoza
FM 4 stations	1,5	in San Rafael
MF 25 kW station	0,5	in San Rafael
MF 10 kW station	0,5	in Malargue
O.B VAN, 4 TV stations	2,5	in Mendoza
Total	12,44	

(in mil. US$)

Table V－3－4 Operation cost of MF transmitter station

(in Austral)

Station	output	Electricity	Fuel	Maintenance	Tel.	Transport.	Travel	Print.	Others	Total
National	25 kW	55000	780	6500	1000	400	500	100	500	64,780
Libertador	10	22000	310	4000	1000	400	300	100	500	28,610
Cuyo	25	55000	780	6500	1000	400	300	100	500	64,580
Nihuil	25	55000	780	6500	1000	400	300	100	500	64,580
San Rafael (M)	25	55000	780	6500	600	400	300	100	500	64,580
R. Malargue (N)	10	22000	310	3000	500	400	300	100	500	227,110
R. Malargue	5	11000	180	1450	500	400	300	100	300	14,230
R. Rio Actuei	1	3200	50	800	300	200	200	100	300	5,150
R. Manantiales	1/4	1000	40	700	100	200	150	100	200	2,540
R. San Rafael	25	55000	780	6500	1000	400	300	100	500	64,580
Uspallata	1	3200	50	800	300	200	200	100	300	5,150
Total		337400	4840	43250	7300	3800	3150	1100	4600	405,840

In above table, lental fee of program transmission line is excluded. For national program
transmission in the province, it is estimated to cost about 16800 US$ (= 18480 Austral)

Table V – 3 – 5 Operation cost of FM station

(in Austral)

Station	Electricity	Maintenance	Prog. link	Others	Total
Co. Arco	2700	1500	2,000	300	6,500
Co. Alto	2700	1500	36,000	300	40,500
Uco	125	300		150	575
Paramillos	125	300		150	575
Uspallata	125	300		150	575
unta de Vacas	20	100		100	220
Las Cuevas	20	100		100	220
La Paz	20	300		150	470
Posterillos	20	100		100	220
Cachueta	20	100		100	220
Malargue	125	300		150	575
Ranquil Norte	20	100		100	220
Horqueta	125	300		150	575
Valle Hermoso	20	100		100	220
Rio Chico	20	100		100	220
Co de Ureta	20	100		100	220
Agua del Toro	20	100		100	220
Co. Chinches	20	100		100	220
Punta de Agua	20	100		100	220
Total	6,265	5,900	38,000	2,600	52,765

Table V-3-6 Operation cost of national TV transmitter network

(in Austral)

Station	Electric.	Fuel	Maintenance	Phone	Transportation	Travel	Print	Others	Prog.lent
Co. Arco	15,000	780	2,500	150	Total 4000	2,500	100	5,000	250,000
Co. Alto	15,000	780	2,500	150		1,000	100	5,000	
Uco	250	35	360			200		500	
Paramillos	250	35	360			200		500	
Uspallata	250	35	360			200			
Punta de Vacas	50		360			200			
Las Cuevas	50		360			200			
La Paz	350	35	360			200			
Posterillos	50		320			100			
Cachueta	50		320			100			
Malargue	250	35	400			200	50		
Ranquil Norte	(50)		400			200			
Horqueta	250	35	500			3000		2,000	
Valle Hermoso	50		320			200			
Rio Chico	50		320			200			
Co.de Ureta	(50)		360			400			
Agua del Toro	(50)		360			200			
Co. Chinches	(50)		360			200			
Punta de Agua	(50)		360			200			
Canalejas	(150)		200			200			
Punta de Horqueta	(150)		200			200			
Muxia Luna	(150)		200			200			
Las Sauces	(40)		200			200			
La More	(40)		200			200			
Arrojito	(40)		200			200			
Total	32,620	1,770	12,780	300	4,000	10,900	250	13,000	

Grand total	325,620 A

PART VI EVALUATION OF DEVELOPMENT PLAN
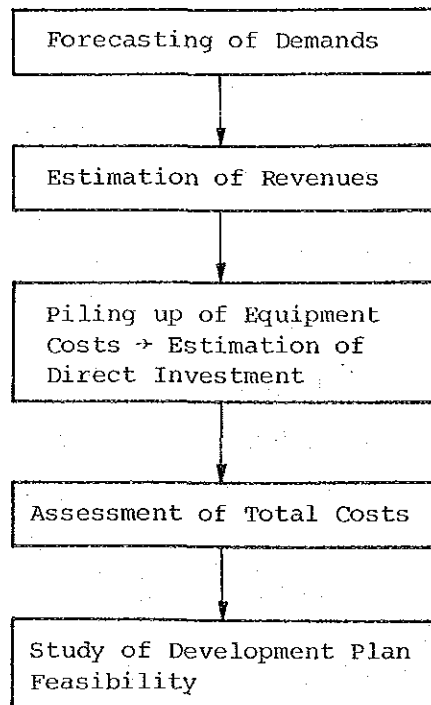
CHAPTER 1 TELECOMMUNICATIONS

1.1 Procedure of Financial Analyses

Appraisal of this development plan should aim at finding out an optimum way of implementation from the point of financial analyses.

As the norm for these analyses, Internal Rate of Return is set as the basic criterion to seek the profitability and stable operation of the telecommunications operating entity.

The economic criterion for the acceptability of the development plan is to estimate the present value of the development plan's benefits net, where the benefits and the costs are defined in incremental terms compared with what the situation would be without the development plan.

Procedures of financial analyses follow the following steps.

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┌──────────────────────────────┐
│    Forecasting of Demands    │
└──────────────────────────────┘
               │
               ▼
┌──────────────────────────────┐
│    Estimation of Revenues    │
└──────────────────────────────┘
               │
               ▼
┌──────────────────────────────┐
│  Piling up of Equipment      │
│  Costs → Estimation of       │
│  Direct Investment           │
└──────────────────────────────┘
               │
               ▼
┌──────────────────────────────┐
│  Assessment of Total Costs   │
└──────────────────────────────┘
               │
               ▼
┌──────────────────────────────┐
│  Study of Development Plan   │
│  Feasibility                 │
└──────────────────────────────┘
```

1.2 Cost Classification

Investment costs of the development plan mainly consist of the following four items.

(1) Costs for plants and equipment
(2) Maintenance costs
(3) Operation costs
(4) Working capital

Preliminary conditions for the study are as follows :

(1) Investments of each phase shall be executed by equal amounts every year.

(2) Operation costs : See Part V , Chapter 2, Section 2.1.2.

(3) Maintenance costs : See Part V , Chapter 2, Section 2.1.2.

The ratio of personnel expenses in the maintenance costs is estimated to share 84% experientially.

Investment plan for each phase of the development plan follows Table V −2−1, "Amount of plant and equipment investment for telecommunications".

1.3 Conditions of Financial Analyses

Taking into account the surrounding situation of the province of Mendoza and its social, economic and political circumstances, it would rather be reasonable that the investment for this development plan would be carried out by a certain private sector (entity) and most portion of the investment costs would be covered by making use of borrowed capital . . . Thus the percentage of it should be set at 90% of the total investment capital.

Subsequent conditions of the financial analyses are as follows :

(1) Interest rate shall be estimated at 8% annually.

(2) Principal and interest on borrowed capital of the investment shall be paid back from the next year of the execution of the investment in the 20 years deferred payments.

(3) The rate of corporation tax shall be set at 3%.

Approximately nearly 9.6% of the total investment is to be spent in the area of rural telecommunications in the development plan.

Share of the rural telephone subscribers in the total number of telephone subscribers is only about 1% yet the investment costs for them shall have to come approximately up to 9.6% of the total investment.

Viability of rural telephone from the point of profitability is supposed to be very bad, and thus two different types of analyses should be required in this under the circumstance. That is,

(1) Financial analyses without rural telephone program.

(2) Financial analyses inclusive of rural telephone program.

1.4 Results of the Analyses

The results of analyses of the development plan predict a very fair and stable future for this investment. Table VI—1—1 shows the cash flow of the investment case of the development plan with the following conditions :

(1) Rural telephones included.

(2) The rate of corporation tax is 3%.

(3) Ratio of borrowed capital to total investment is 90%.

In this case, internal rate of return for the total capital comes to 12.00% and in case rural telephones should be excluded from the above, the internal rate of return rises to 14.47% as shown in Table VI—1—2.

Thus, this development plan proves to be a very prominent and profitable business even for private sectors on condition that they can borrow loan capital to as far as 90% of the total sum.

1.5 Sensitivity Analyses – Eligibility of Investment Cost and Rate Level

This development plan is based upon the demand forecasting which has been established on condition that the present rate level and tariff structure should be unchanged until at least the year 2005 . . . the final year of the development plan.

Sensitivity analyses would thus be required to be set from the following two aspects,

(1) Rate level analyses and

(2) Increase and decrease of investment cost.

Thinking of the trend of the share of telephone income in the GDP of the Argentine Republic which has not been increasing remarkably as one of the backlash of hyper inflation and of the existence of pressing demand for telephone in the province of Mendoza it should only be required to study what would happen when substantial raise of the rate level of telephone should take place and can exclude the cases of decrease of rate level.

The other analysis should deal with the studies where investment costs vary from increase to decrease.

The following six cases have been selected for each investment plan . . . investment plan inclusive of rural telephone and investment plan exclusive of rural telephone.

Table VI-1-1 Financial analysis of telecommunications development plan
(Cash flows)

* Rural telephones included
* Tax 3%
* Capital (Internal) 10%
         (Loan) 90%
* Loan interest .... 8.0%   (Yearly)

Year	Number of telephone lines	Revenues	Loan capital	Remaining value	Total revenues	Total investment	Working capital	Operation cost	Tax	Paid principal and interest	Total costs	Total revenues-total costs	Cumulative investment results
1	0	0	14414760	0	14414760	16016400	0	0	0	0	16016400	-1601640	-1601640
2	14777	4713863	14414760	0	19128623	16016400	1414159	3474439	141416	1153181	22199595	-3070972	-4672612
3	29554	9427726	14414760	0	23842486	16016400	1414159	5918738	282832	2306362	25538491	-2096005	-6768617
4	44331	14141589	14414760	0	28556349	16016400	1414159	8363037	424248	3459542	29677386	-1121037	-7889654
5	59108	18855452	14414760	0	33270212	16016400	1414159	10807336	565664	4612723	33416282	-146070	-8035724
6	73885	23569315	14688360	0	38257675	16320400	1414159	13204075	707079	5765904	37411617	846058	-7189666
7	90694	28931386	14688360	0	43619746	16320400	1608621	15795276	867942	6940973	41533212	2086534	-5103132
8	107503	34293457	14688360	0	48981817	16320400	1608621	18386477	1028804	8116042	45460344	3521473	-1581659
9	124312	39655528	14688360	0	54343888	16320400	1608621	20977678	1189666	9291110	49387475	4956413	3374754
10	141121	45017599	14688360	0	59705959	16320400	1608621	23568880	1350528	10466179	53314608	6391351	9766105
11	157930	50379670	23374260	0	73753930	25971400	1608621	26903245	1511390	11641248	67635904	6118026	15884131
12	177716	59881404	23374260	0	83255664	25971400	2850520	31479509	1796442	13511189	75609060	7646604	23530737
13	217502	69383138	23374260	0	92757398	25971400	2850520	36055773	2081494	15381130	82340317	10417081	33947816
14	247288	78884872	23374260	0	102259132	25971400	2850520	40632038	2366546	17251070	89071574	13187558	47135374
15	277074	88386606	23374260	0	111760866	25971400	2850520	45208302	2651598	19121011	95802831	15958035	63093409
16	306860	97888340	0	0	97888340	0	2850520	48058822	2936650	34110297	87956289	9932051	73025460
17	306860	97888340	0	0	97888340	0	0	48058822	2936650	33020749	84056221	13832119	86857579
18	306860	97888340	0	0	97888340	0	0	48058822	2936650	32011202	83006674	14881666	101739245
19	306860	97888340	0	0	97888340	0	0	48058822	2936650	30961654	81957126	15931214	117670459
20	306360	97888340	0	0	97888340	0	0	48058822	2936650	29912107	80907579	16980761	134651220
21	306360	97888340	0	0	97888340	0	0	48058822	2936650	28862559	79858031	18030309	152681529
22	292083	93174477	0	0	93174477	0	-1414159	45614523	2795234	27813011	74808609	18365868	171047397
23	277306	88460614	0	0	88460614	0	-1414159	43170224	2513818	26763464	71173347	17287267	188334664
24	262529	83746751	0	0	83746751	0	-1414159	40725925	2124035	25713916	67538085	16208666	204543330
25	247752	79032888	0	0	79032888	0	-1414159	38281626	2370987	24664369	63902823	15130065	219673395
26	232975	74319025	0	0	74319025	0	-1414159	35837328	2229571	23614821	60267561	14051464	233724859
27	216166	68956954	0	0	68956954	0	-1608621	33246126	2068709	22565273	56271487	12685467	246410326
28	199357	63594883	0	0	63594883	0	-1608621	30654925	1907846	21515726	52469876	11125007	257535333
29	182548	58232812	0	0	58232812	0	-1608621	28063724	1746984	20466178	48668265	9564547	267099880
30	165739	52870741	0	0	52870741	0	-1608621	25472522	1586122	19416631	44866654	8004087	275103967
31	148930	47508670	0	0	47508670	0	-1608621	22881321	1425260	18367085	41065043	6443627	281547594
32	119144	38006936	0	0	38006936	0	-2850520	18305057	1140208	17317535	33912280	4094656	285642250
33	89358	28505202	0	0	28505202	0	-2850520	13728793	855156	16267988	28001417	503785	286146035
34	59572	19003468	0	0	19003468	0	-2850520	9152528	570104	15218440	22905552	-3087084	283058951
35	29786	9501734	0	0	9501734	0	-2850520	4576264	285052	14168893	16179689	-6677955	276380996
36	0	0	0	0	0	0	-2850520	0	0	0	-2850520	-2850520	279231516

* IRR   12.00%

Table VI-1-2 Financial analysis of telecommunications development plan
(Cash flows)

* Rural telephones excluded
* Tax 3%
* Capital (Internal) 10%
        (Loan) 90%
* Loan interest 8.0% (Yearly)

Year	Number of telephone lines	Revenues	Loan capital	Remaining value	Total revenues	Total investment	Working capital	Operation cost	Tax	Paid principal and interest	Total costs	Total revenues-total costs	Cumulative investment results
1	0	0	12620340	0	12620340	14022600	0	0	0	0	14022600	-1402260	-1402260
2	14613	4661547	12620340	0	17281887	14022600	1398464	3059984	139846	1009627	19630521	-2348634	-3750894
3	29226	9323094	12620340	0	21943434	14022600	1398464	5289208	279693	2019254	23009219	-1065785	-4816679
4	43839	13984641	12620340	0	26604981	14022600	1398464	7518432	419539	3028882	26387917	217064	-4599615
5	58452	18646188	12620340	0	31266528	14022600	1398464	9747656	559386	4038509	29766615	1499913	-3099702
6	73065	23307735	13858020	0	37165755	15397800	1398464	12036441	699232	5048136	34580073	2585682	-514020
7	89803	28647157	13858020	0	42505177	15397800	1601827	14528587	859415	6156778	38544407	3960770	3446750
8	106541	33986579	13858020	0	47844599	15397800	1601827	17020734	1019597	7265419	42305377	5539222	8985972
9	123279	39326001	13858020	0	53184021	15397800	1601827	19512880	1179780	8374061	46066348	7117673	16103645
10	140017	44665423	13858020	0	58523443	15397800	1601827	22005027	1339963	9482702	49827319	8696124	24799769
11	156755	50004845	20937420	0	70942265	23263800	1601827	25061838	1500145	10591344	62018954	8923311	33723080
12	186370	59452030	20937420	0	80389450	23263800	2834156	29350977	1783561	12266338	69498832	10890618	44613698
13	215985	68899215	20937420	0	89836635	23263800	2834156	33640117	2066976	13941331	75746380	14090255	58703953
14	245600	78346400	20937420	0	99283820	23263800	2834156	37929256	2350392	15616325	81993929	17289891	75993844
15	275215	87793585	20937420	0	108731005	23263800	2834156	42218396	2633808	17291318	88241478	20489527	96483371
16	304830	97240770	0	0	97240770	0	2834156	45052551	2917223	30820257	81624187	15616583	112099954
17	304830	97240770	0	0	97240770	0	0	45052551	2917223	30871941	78841715	19399055	131499009
18	304830	97240770	0	0	97240770	0	0	45052551	2917223	28923626	76893400	20347370	151846379
19	304830	97240770	0	0	97240770	0	0	45052551	2917223	27975310	75945084	21295686	173142065
20	304830	97240770	0	0	97240770	0	0	45052551	2917223	27026995	74996769	22244001	195386066
21	304830	97240770	0	0	97240770	0	0	45052551	2917223	26078679	74048453	23192317	218578383
22	290217	92579223	0	0	92579223	0	-1398464	42823327	2777377	25130363	69332603	23246620	241825003
23	275604	87917676	0	0	87917676	0	-1398464	40594103	2637530	24182048	66015217	21902459	263727462
24	260991	83256129	0	0	83256129	0	-1398464	38364879	2497684	23233732	62697831	20558298	284285760
25	246378	78594582	0	0	78594582	0	-1398464	36135655	2357837	22285417	59380445	19214137	303499897
26	231765	73933035	0	0	73933035	0	-1398464	33906431	2217991	21337101	56063059	17869976	321369873
27	215027	68593613	0	0	68593613	0	-1601827	31414284	2057808	20388785	52259050	16334563	337704436
28	198289	63254191	0	0	63254191	0	-1601827	28922137	1897626	19440470	48658406	14595785	352300221
29	181551	57914769	0	0	57914769	0	-1601827	26429991	1737443	18492154	45057761	12857008	365157229
30	164813	52575347	0	0	52575347	0	-1601827	23937844	1577260	17543839	41457116	11118231	376275460
31	148075	47235925	0	0	47235925	0	-1601827	21445698	1417078	16595523	37856472	9379453	385654913
32	118460	37788740	0	0	37788740	0	-2834156	17156558	1133662	15647207	31103271	6685469	392340382
33	88845	28341555	0	0	28341555	0	-2834156	12867419	850247	14698892	25582402	2759153	395099535
34	59230	18894370	0	0	18894370	0	-2834156	8578279	566831	13750576	20061530	-1167160	393932375
35	29615	9447185	0	0	9447185	0	-2834156	4289140	283416	12802261	14540661	-5093476	388838899
36	0	0	0	0	0	0	-2834156	0	0	0	-2834156	2834156	391673055

* IRR   14.47%

Other than the fundamental investment plans, six cases of sensitivity analyses are as follows :

Case 1. Investment plan with 5% substantially increased tariff.

Case 2. Investment plan with 10% substantially increased tariff.

Case 3. Investment plan with 10% substantially cost decrease.

Case 4. Investment plan with 5% substantially cost decrease.

Case 5. Investment plan with 5% substantially cost increase.

Case 6. Investment plan with 10% substantially cost increase. .

From the past experience of tariff hike in Japan, 5% price elasticity on traffic with the duration of one year has been set for the Case 1 where the tariff hike is 5%, and 8% price elasticity with the duration of one year for the Case 2, where the tariff hike is 10%.

The results of these analyses are shown in Fig. VI−1−1 and the conclusion of them guarantees that even in the case of 10% increase of investment cost I.R.R. stands at 10.1% with rural telephone included; thus under no circumstances I.R.R. decreases less than 10% in the development plan.

1.6 Economic Analysis by an Estimation of Production Inducement Value

1.6.1 Merit of this methodology

Economic analysis by an estimation of production inducement value can be applied as one of the substitute economic analysis. This methodology is useful especially when there should be many projects competing with one another (developing countries always face this type of situation).
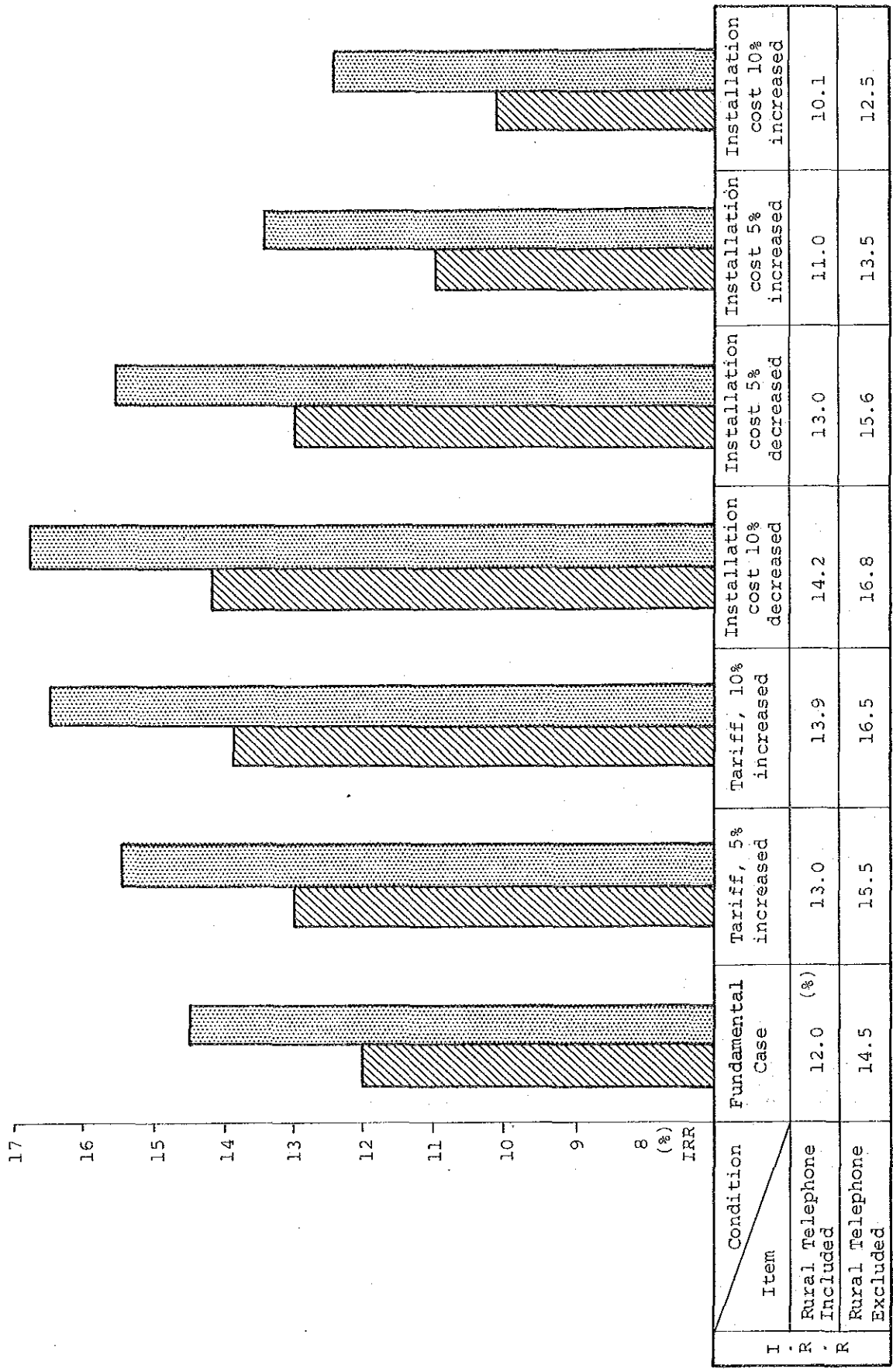
Condition Item	Fundamental Case	Tariff, 5% increased	Tariff, 10% increased	Installation cost 10% decreased	Installation cost 5% decreased	Installation cost 5% increased	Installation cost 10% increased
R. Rural Telephone Included	12.0 (%)	13.0	13.9	14.2	13.0	11.0	10.1
R. Rural Telephone Excluded	14.5	15.5	16.5	16.8	15.6	13.5	12.5

Fig. VI – 1 – 1   Results of sensitivity analyses

Because production inducement value analysis makes it possible to calculate the output of a country generated by the final demand (investment) for each industrial sector, as described later, and therefore presents data closely corresponding to the entire national development project. As a result, it can supply objective criteria for selection to the policy makers.

1.6.2 How to estimate production inducement values

(1) Production inducement values

Fig. VI—1—2 shows the flow for calculating production inducement values, using intra industries input output tables.

Production inducement values have direct and indirect effects as shown in this figure. The direct effect is the total demand (production) generated by product linkage. In the case of a telecommunications facilities construction project, for example, switching equipment, transmission system, terminal equipment like telephone sets, and engineering service for installation are required firstly. Secondly, these telephone facilities are composed of components such as LSIs, PC boards, and connectors. Thirdly, materials and water are to be furnished to the production of such components. Fig. VI—1—3 shows the flow of multiplied effects.

Through linking production inducement by direct effects, a part of profit flows to added—value sectors, such as employees' income and capital consumption allowance, so that household consumption expenditures and fixed capital formation are generated. They result in new demand, thereby providing an inducement for production. The indirect effect is the total of these production values called "production inducement value by consumption." In addition to consumption, this is induced by fixed capital formation, extra—household consumption, and government expenditure.
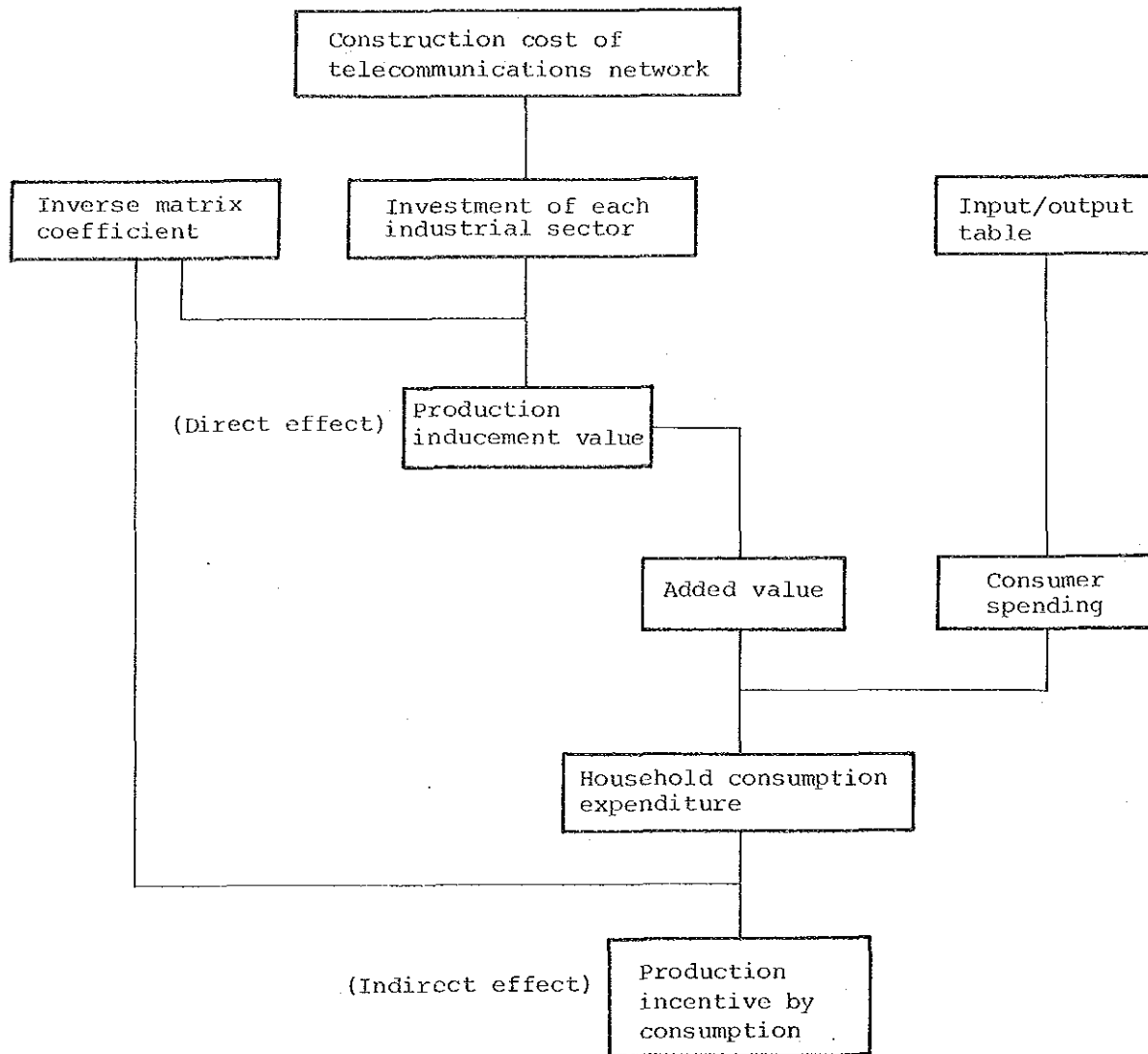
Note: In addition to household consumption expenditure,
the indirect effect includes production generated by
fixed capital formation, extra-household consumption
expenditure, and government expenditure.

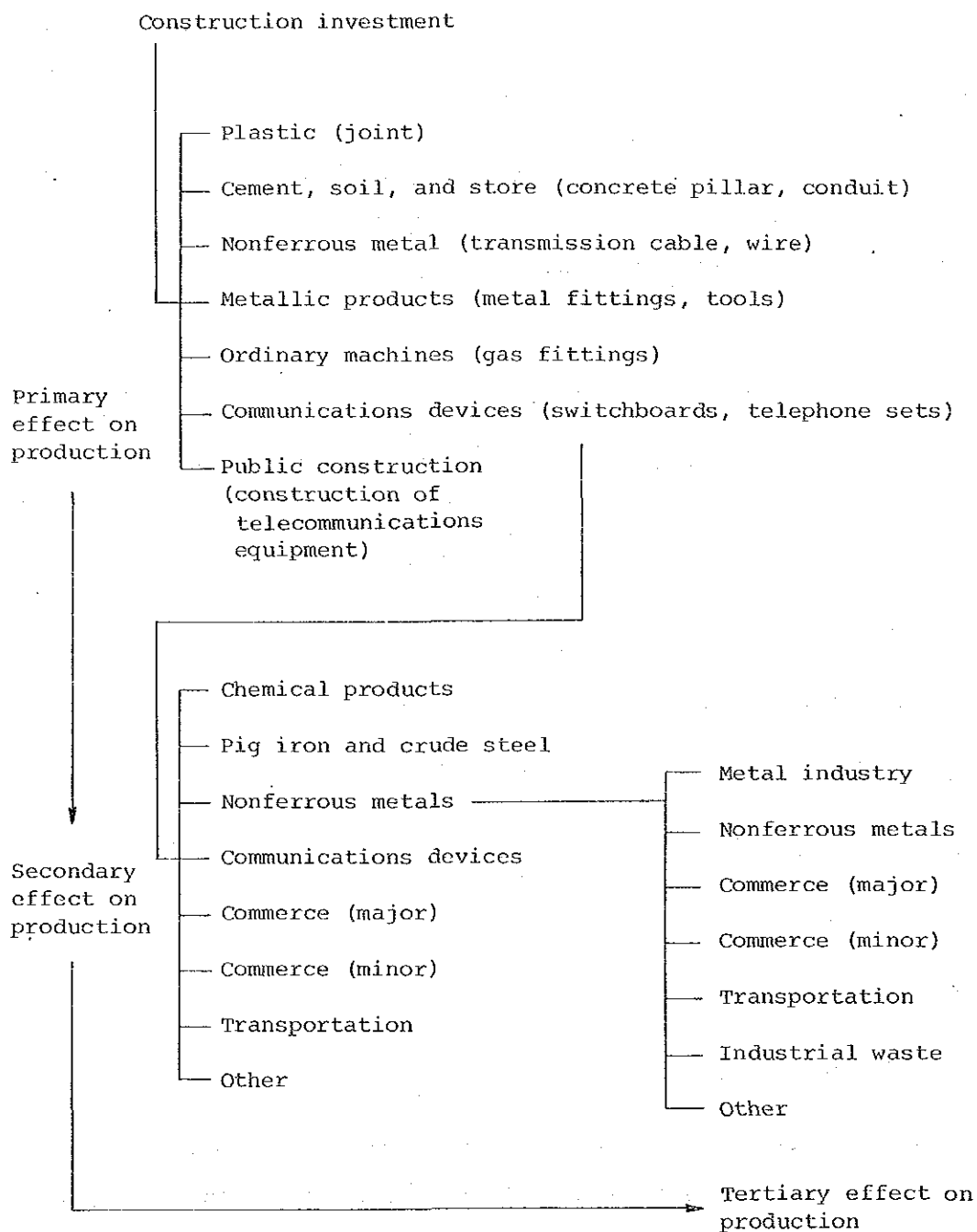Fig. VI – 1 – 2 Flow of calculation of production inducement value

Construction investment

```
                   ┌─ Plastic (joint)
                   ├─ Cement, soil, and store (concrete pillar, conduit)
                   ├─ Nonferrous metal (transmission cable, wire)
                   ├─ Metallic products (metal fittings, tools)
                   ├─ Ordinary machines (gas fittings)
Primary            ├─ Communications devices (switchboards, telephone sets)
effect on          └─ Public construction
production            (construction of
                       telecommunications
                       equipment)
```

```
                   ┌─ Chemical products
                   ├─ Pig iron and crude steel                    ┌─ Metal industry
                   ├─ Nonferrous metals ──────────────────────────┤
                   ├─ Communications devices                      ├─ Nonferrous metals
Secondary          ├─ Commerce (major)                            ├─ Commerce (major)
effect on          ├─ Commerce (minor)                            ├─ Commerce (minor)
production         ├─ Transportation                              ├─ Transportation
                   └─ Other                                       ├─ Industrial waste
                                                                  └─ Other
```

Tertiary effect on
production

Fig. VI – 1 – 3   Flow of multiplied effects on production by investment in
telecommunications equipment (direct effect)

(2) Formula for calculation of production inducement values

Production inducement value can be calculated by the following two formulas.

① $(I - A)^{-1} F$

This formula is used when no product is imported or only products which cannot be manufactured domestically are imported in accordance with the industry import substitution policy. In this case, imports are calculated as an input.

② $[I - (I - M) A]^{-1} [(I - M) F + E]$

This formula assumes that imports are induced by domestic demand, excluding exports, while the final demand is divided into domestic final demand F and exports E. This formula is usually used in Japan.

Where :

    $(I - A)^{-1}$: inverse coefficient matrix

    $[I - (I - M) A]^{-1}$: inverse coefficient matrix

    F : final demand vector

    M: import vector

    E : Export vector

1.6.3 Production inducement values in Argentina

(1) The characteristic of Argentina's intra—industry input output table is that imports are calculated as an input sector, which means that only products which are not manufactured domestically are imported. This shows the strength of the import substitution industry policy of Argentina.

Appendix 8 shows the intra—industry input output table (purchase price table, input coefficient table, inverse matrix coefficient table, import table) of Argentina in 1973.

(2) Formula for production inducement values

Due to the above characteristic of the intra—industry input output table of Argentina, formula (1) is used for the direct effect, and formula (2), for the indirect effect.

$$X = (I - A)^{-1} F \dots\dots\dots(1)$$

$$X = (I - A)^{-1} (I - A)^{-1} CLF \dots\dots(2)$$

Where:

X : production inducement value

F : final demand vector

$(I - A)^{-1}$: inverse matrix coefficient

C: Consumer spending index (or expenditure coefficient in the case of fixed capital formation)

L : Input coefficient to employees' income (or operating income in the case of fixed capital formation)

(3) Final demand (construction cost)

Table VI—1—3 lists the construction costs for each industrial sector in accordance with 57 sectors of intra—industry input output table of Argentina.

For telecommunications equipment, communications devices and construction cover over 80% of the final demand.

When adding the nonferrous metal sector (transmission cable and wire), 95% of the construction cost is accounted for by these sectors.

(4) Production inducement value

Table VI-1-4 shows the calculation of the production inducement value. This table classifies Argentina's industries into nine sectors and shows each value with the final demand (construction cost) as 100. The following conclusions were drawn from Table VI-1-4:

*   The production inducement value in all is expected to be 289 (including construction cost of 100), of which 190 comes from direct effect (including the construction cost of 100), 75 comes from household consumption, and 24 comes from the fixed capital formation although here the relationship is not so clear.

*   Of the direct effects, the manufacturing sector receives the greatest multiplied effect of 113 (including the final demand of 61), followed by construction with 39 (the effect of this sector is all final demand), commerce with 12, and transportation/communications with 11.

*   The household consumption expenditure gives the greatest effect of 29 to the manufacturing sector, followed by the agriculture/forestry, communications, and service sector with 9 respectively, and finally finance, security, and commerce.

*   For the total of the production inducement values, production of over 10% of the construction cost is generated in almost every sector. Therefore, it can be concluded that investment in telecommunications equipment produces a global impact on society.

Table Ⅵ – 1 – 3 Details of construction cost

Item	Investment value (Thousand US$)	Ratio of material to construction costs		Demand in each sector (Thousand US$)		
		Materials cost	Construc-tion cost	(37)	(44)	Other
Subscriber telephone	28,588	50	50	14,294	14,294	
Public telephone	7,407	50	50	3,704	3,703	
Rural telepohne	28,119	70	30	19,683	8,436	
Switching equipment	91,532	70	30	64,072	27,460	
Subscriber lines	101,344	50	50		50,672	
						608 (27)
						6,131 (28)
						35,521 (31)
						7,550 (32)
						862 (34)
Junction lines	2,963	70	30	2,074	889	
Trunk lines	26,593	70	30	18,615	7,978	
Mobile telepohne	4,875	70	30	3,413	1,462	
Telegraph	119	70	30	83	36	
Sum	291,540			125,938	114,930	50,672

Symbol 27: Plastic products   (Joint)
        28: Cement, lime   (Concerte pillar, conduits)
        31: Nonferrous metals   (Transmission cable, wire)
        32: Metallic products   (Metal fittings for cable and tools)
        34: Ordinary machines   (Gas fittings)
        37: Communications devices (Switchboards, transmission equipment, telephone sets)
        44: Public construction   (Construction of telecommunications equipment)

Table Ⅵ－1－4 Production inducement value

| Item | Direct effect | Indirect effect | | Sum |
		Household consumption expenditure	Fixed capital formation	
Agriculture, forestry, and fishery	0.46	9.51	0.16	10.13
Mining	1.73	0.7	0.14	2.57
Manufacturing	113.07 (60.6)	28.56	14.19	155.83 (60.6)
Electricity, gas, and water supply	2.62	2.62	0.26	5.48
Construction	39.42 (39.4)	0	5.62	45.04 (39.4)
Commerce	12.23	7.02	1.65	20.9
Transportation and communication	11.05	9.41	1.29	21.75
Finance and security	4.41	7.98	0.48	12.86
Service	5.39.	9.25	0.26	14.91
Sum	190.37 (100)	75.05	24.05	289.47 (100)

The figures in parentheses are construction costs.

CHAPTER 2 BORADCASTING

As aforementioned in the previous section, study on the present state of broadcasting in the province of Mendoza has been made in order to establish the development plan of broadcasting network up to 2005 including inauguration of new service to meet with the present state and future trend of the society.

Broadcasting in the province restarted several years ago after the internal confusion for about more than ten years as the new broadcasting of democratic society although it has a long history since 1935. The request asking for formulating the expansion plan of broadcasting network together with telecommunications in the province, to the Government of Japan is particularly significant for making more close relationships between the two countries.

The province of Mendoza is expected to develop as one of the most economically prosperous province in Argentina with its blessed natural resources, and is recognized as the one of the most important provinces of the country.

However, concerning the broadcasting in the province, it seems rather inferior than that of other infrastructures such as electricity, road, school education etc., and also broadcasting of other major provinces.

Program transmission lines are not yet facilitated enough so that the broadcasters are receiving programs through limited number of transmission lines.

Major objectives of the plan are aimed at upgrading the broadcasting comparable with that of the present advanced countries in Europe and so on, and it is convinced that the plan is very ambitious and furthermore practical for the present to cope with the future development.

The plan is made by the modification of existing plans of the Secretary of Communications, COMFER and the Government of the province of Mendoza based on the survey and analysis of the present state of broadcasting, reflecting the opinion of counterparts those participated in the survey and the opinion of authorities and enterprises concerned, while imaging the future of Argentina's broadcasting to catch up with the developed countries.

The classification and the role of each broadcaster will be presumably shared among national, public, education/university and private broadcasting through the establishment of their own philosophy and policy, resulting full of variety in broadcasting.

Equipment plan for the studio is exempted from the development plan, however it is believed that the introduction of some equipment will be necessary for live service.

Since it is not able to clarify the each role and characteristics of national, public, education/university and private broadcasting, there are some questions left in the plan, however intensions of the Governments of the Argentine Republic and the province of Mendoza are reflected in many points.

Some proposals for solving the technical problems of which the broadcasters are facing now, will be effective for establishing the future plan. For the execution of the plan, a lot of elaborate works and provision are required, however it is convinced that the principal directioning has been formulated.

Education of the human resources will be the fundamental requirement for the democratic Argentine Republic. It also requires enormous time and expenses for training of instructors and trainees. In the sense, education/university broadcasting is given the priority than public broadcasting. Of course, programs will be mainly produced in the key stations in Buenos Aires, and the Ministry of Education has been planning to modernize the education to cope with the recent tendency. This will reflect for establishing nationwide educational broadcasting system in the very near future. In fact, such movement is seen in some released news.

Concerning the public broadcasting, the policy of the Government of the province of Mendoza is reflected, so it is expected that the final determination for the public broadcasting will be made after the submission of this Report.

Concerning the total expenditure for the expansion and improvement of broadcasting network in the province, it necessiates the total expenditure of about 52 million US dollars including the cost for minimum studio facilities, about 2.2 US dollars/capita/year, equivalent to 0.08% of GNP/capita/year during the period of about 18 years, resulting the continuation of idealistic broadcasting service, then it is pointed out that it is not so expensive compared with the expenses for other infrastructures.

Concerning the definite effect of broadcasting upon the society, it is strongly related to almost all of the society and needless to say, it contributes to all of the human society. Especially, effect on the education holds the key of the future development of broadcasting, so it is strongly required to complete the construction of broadcasting network which will be comparable with that of other infrastructures like electricity and traffic service.

Technological innovation in electronics will continue a progress with rapid stride even in the middle of 1990's, and other new services than the present teletext and bilingual broadcasting will be developed and the necessity of taking new look will be required. Nevertherless, it can be directly applied in any way, without modifying the network which is proposed in the report except for studio equipment, perhaps in the field of extended definition TV, facsimile and/or still picture broadcasting.

CHAPTER 3 BENEFITS FROM IMPROVED TELECOMMUNICATIONS AND BROADCASTING

Many telecommunications and broadcasting professionals or development experts have observed, but have not well documented, individual cases in which specific benefits of improved communications and broadcasting have been associated with changes in telecommunications and broadcasting infrastructure.

Still, there seem to be many cases where constructions of telecommunications and broadcasting networks have been so beneficial to exchange information in the form of personal and public communication, dealing with market information for expansion of sales and prices, encouraging to give rise to new economic activities especially in rural areas, expanding the literate stratum of society, furnishing better level of medical service to every part of the province, giving better chances of participation in national economy because closer relationships between rural and central areas should be possible, mitigating torrential inflow of population to city areas, enhancing social ties of communities, reducing transportation costs, strengthening emergency precautions of society and giving both local and central governments better chances of penetration of administrative policies to society.

Thus, construction of modern and efficient telecommunications and broadcasting system means direct acceleration to the speed of social and economic growth of the province.

Table VI－3－1 has been arranged to give clearer ideas to people innumerable benefits from improvement of telecommunications and broadcasting in every part and sector of the province.

Table VI－3－1 Benefits of telecommunications and broadcasting development in the province of Mendoza

	Item	Direct effects	Indirect effects
1	Food supply	(1) Increase in agricultural products (2) Supporting management of large－scale organization and administrative structure (3) Enhanced efficiency and productivity in agricultural sector being supported by smooth flow of market information	(1) Stabilized national income (2) Foreign currency earning
2	Diversified economy	(1) A way of supporting economic development (Scale expansion, modernization and moneymaking)	(1) Development and diversificaion of industries from sightseeing, manufacturing and wholesale to tertiary (including service) industry
3	Employment in rural areas	(1) Infrastructure to rise new economic activities	(1) Increased chances of employment in rural areas
4	Illiteracy rate and skills of workers	(1) Improved national standard of living and worker skill development	(1) Cost reduction by decreasing the number of teachers (2) Cost reduction by decreasing the number of educational facilities
5	Medical service level	(1) Increased chances of diagnosis and treatment by doctors of rural clinics and hospitals (2) Wide range medical network adjustment	(1) Cost reduction in hospitals (2) Solution of doctor shortage

	Item	Direct effects	Indirect effects
6	Participation in national economy	(1) Closer relationships between rural and central areas	(1) Orders from coustomers and communication between suppliers and customers (2) Acquisition of market information at low cost
7	Reduction of migration flow	(1) Reduced migraions of workers	(1) Reduced population inflow to cities by increased chances of employment in rural areas (2) Improved standard of living by telephone services and broadcasting
8	Closer relationship between provincial communities	(1) Enhanced social ties of communities	
9	Geographical and climatological conditions	(1) Reductin of transportaion system cost by telecommunications featuring no physical distance (2) Quick actions for natural calamities (3) Prevention of disasters	(1) Strengthened emergency service systems such as police
10	Contact with government	(1) Closer administrative contacts between provinces and the central government by the changed means of communications (change from physical means to tele-communicaions)	(1) Involvement of rural inhabitants in national policy, influence on national-consciousness, and influence on governmental programs

APPENDIX

Appendix 1 Data used to forecast macro telephone demand

Shown below are the income elasticity model equation, the number of main lines, cross—national data of population and GNP, population of Argentina and the forecast of its economic growth rate, all necessary for forecasting macro telephone demand.

(1) Income elasticity model equation

By applying cross—national data on the number of main lines per 100 persons and GNP per capita to the income elasticity model (refer to Section III 5.1), the income elasticity model equation is obtained by method of least squares. The model equation and data used for it are indicated in Fig. A—1—1, Tables A—1—1 and A—1—2. In Fig. A—1—1, the point AR corresponds to the telephone density (installed main lines per 100 persons) of Argentina in 1983.

Telephone demand is defined as the number of main lines + waiting list. Fig. A—1—1 also shows the telephone demand per 100 persons in Argentina, that is, lines A—B'and A—B".

Point A is the point that corresponds to the telephone demand per 100 persons of 11.13 and the GNP per capita of US$ 2,510, which are the figures for Argentina in the year 1983.

Point B' is the result of moving the point A in parallel with the line of the model equation to the point which corresponds to the GNP per capita for the final forecast year (US$ 4,510).

Point B" is an alternative for the point B'. Point B" is obtained by modifying the inclination of line A—B' which is parallel to the line of model equation based on the installed main lines, with the assumption that the waiting ratio (defined as the waiting list per telephone demand) at the stage with the telephone demand per 100 persons of around 20 would become half of that at the stage with the telephone demand of around 10. This assumption is derived from experiences.

After discussion on the demand estimation with the officials of the Communications Director's Office, the line A—B' is selected for the estimation of the telephone demand.

Main lines
per 100
persons

$\log y = -4.036738 + 1.151954 \log x$
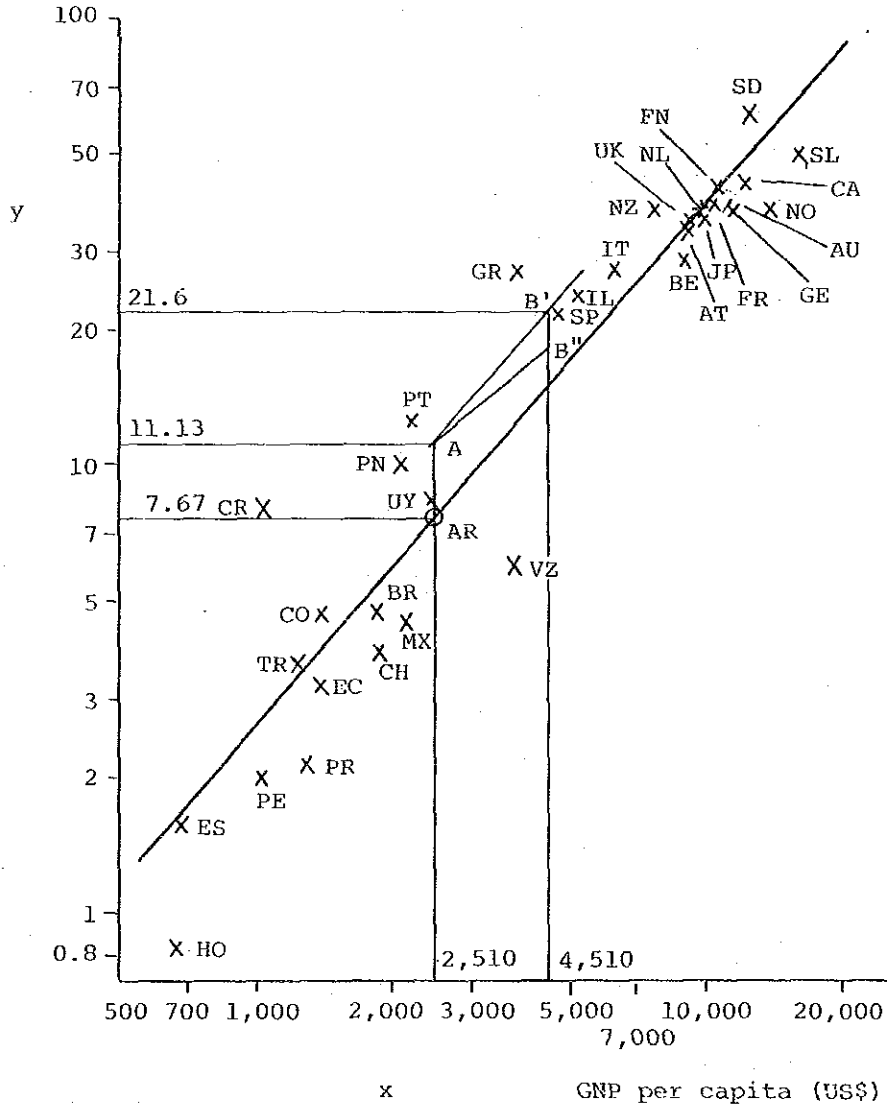
$y = 0.000918887 \times x^{1.151954}$

y

21.6

11.13

7.67

x   GNP per capita (US$)

Fig. A – 1 – 1 Relation between GNP per capita and main lines per 100 persons

Table A−1−1 GNP per capita and main lines per 100 persons

$Y = ax^b$ End of the year 1983

X(i)	Y(i)	Difference	Nation	Nomenclature
2,510	7.66870	0.09112472	Argentina	AR
11,460	37.03560	−6.54135816	Australia	AU
9,230	33.75280	−0.20915702	Austria	AT
9,130	28.84540	−4.69305074	Belgium	BE
1,870	4.67680	−0.72170716	Brazil	BR
12,280	42.02830	−5.15968563	Canada	CA
1,890	3.74080	−1.72426633	Chile	CH
1,410	4.72110	0.82151966	Colombia	CO
1,070	8.19670	5.35895475	Costa Rica	CR
1,420	3.22540	−0.70605513	Ecuador	EC
680	1.58640	−0.09698200	El Salvador	ES
10,710	41.55870	1.25033684	Finland	FN
10,480	38.31880	−0.99398886	France	FR
.11,400·	38.34190	−4.97233192	Germany Fed. Rep.	GE
3,910	27.58130	14.95473551	Greece	GR
670	0.83070	−0.82419640	Honduras	HO
5,270	23.84670	6.03861574	Israel	IL
6,390	27.44920	5.21482934	Italy	IT
10,100	35.57720	−2.09812910	Japan	JP
2,180	4.45530	−1.98655370	Mexico	MX
9,870	38.03090	1.34221118	Netherland	NL
7,710	37.40240	9.79851646	New Zealand	NZ
13,990	36.72880	−18.10573395	Norway	NO
2,110	10.03050	3.82634812	Panama	PN
1,320	2.11770	−1.49656758	Paraguay	PR
1,040	2.02490	−0.72138797	Peru	PE
2,230	12.36760	5.75524794	Portugal	PT
4,770	22.12250	6.24630871	Spain	SP
12,440	60.22090	12.32398966	Sweden	SD
16,250	47.74760	−17.41105362	Switzerland	SL
1,250	3.53860	0.14422273	Turky	TR
9,180	34.70370	0.95358227	United Kingdom	UK
2,470	8.35300	0.91437000	Uruguay	UY
3,830	5.91640	−6.41302487	Venezuela	VZ

a = 0.000918887
b = 1.151954157

X(i): GNP per capita (US$)

Y(i): No. of main lines per 100 persons $= \dfrac{\text{No. of main lines}}{\text{Population}} \times 100$

Source

    GNP per capita and population: World Bank Atlas 1985

    Main lines: Yearbook of Common Carrier Telecommunication Statistics, 1986

Table A-1-2   Population, GNP per capita, main lines, telephone sets and waiting list (1/2)

End of the year 1983

Nation	Population (10³)	GNP per capita (US$)	Main lines (10³)	Telephone sets (10³)	Waiting list (10³)
Argentina	29,627	2,510	2,272	3,108	1,026
Australia	15,369	11,460	5,692	8,298	50
Austria	7,549	9,230	2,548	3,469	85
Belgium	9,856	9,130	2,843	4,111	16
Brazil	129,662	1,870	6,064	9,856	-
Canada	24,907	12,280	10,468	16,618	-
Chile	11,682	1,890	437	629	115
Colombia	27,515	1,410	1,299	1,894	315
Costa Rica	2,379	1,070	195	292	11
Ecuador	8,216	1,420	265	318	-
El Salvador	5,232	680	83	116	11
Finland	4,863	10,710	2,021	2,777	1
France	54,652	10,480	20,942	31,483	104
Germany Fed. Rep.	61,421	11,400	23,550	35,137	33
Greece	9,840	3,910	2,714	3,313	901
Honduras	4,093	670	34	35	-
Israel	4,097	5,270	977	1,430	197
Italy	56,836	6,390	15,601	22,992	480
Japan	119,259	10,100	42,429	61,208	110
Mexico	75,011	2,180	3,342	6,414	-
Netherland	14,362	9,870	5,462	8,272	46
New Zealand	3,203	7,710	1,198	1,939	2
Norway	4,133	13,990	1,518	2,395	13
Panama	1,964	2,110	197	220	8
Paraguay	3,211	1,320	68	78	-
Peru	17,877	1,040	362	543	205
Portugal	10,099	2,230	1,249	1,685	119
Spain	38,228	4,770	8,457	13,345	296
Sweden	8,331	12,440	5,017	7,410	-
Switzerland	6,482	16,250	3,095	5,113	4
Turkey	47,279	1,250	1,673	2,665	1,825

Table A – 1 – 2   Population, GNP per capita, main lines, telephone sets and waiting list (2/2)

End of the year 1983

Nation	Population (10³)	GNP per capita (US$)	Main lines (10³)	Telephone sets (10³)	Waiting list (10³)
United Kingdom	56,334	9,180	19,550	29,062	3
Uruguay	2,969	2,470	248	322	66
Venezuela	17,257	3,830	1,021	1,021	107

Source: Population, GNP per capita: World Bank Atlas 1985

Main lines, telephone sets   Yearbook of Common Carrier
and waiting list: Telecommunication Statistics, 1986

(2) Population

For the population of the forecast year, the forecast value by the Statistics Bureau (INDEC) is used as shown in Table A – 1 – 3.

(3) Economic growth rate

Since no material applicable to this plan is available for a long – term forecast of the growth rate of GNP per capita, it is estimated with the following equation:

Growth rate for GNP per capita
= GNP growth rate – population growth rate
= 4*1 – 1 · 3*2 = 2.7 (%/year)

Where *1 : Value shown in the "Economic Development and Growth Project for 1985 ~ 1989"

*2 : Average value for population growth ratio for the years 1985 through 2005 shown in Table A – 1 – 3.

Therefore, GNP per capita for the year 2005 is obtained as follows:

GNP per capita at the year 2005
$$= 2,510 \times 1.027^{22} = 4,510 \text{ US dollars}$$

(4) Telephone demands for the forecast years

As shown in Fig. III−5−1, the telephone demand densities for the forecast years are primarily obtained by applying GNP per capita for the forecast years to the income elasticity model equation. Then, for the telephone demands for the forecast years, the above result are multiplied by the population.
These telephone demands are shown in Fig. A−1−2.

Table A − 1 − 3 Population

Year	Population	Urban population	Rural popuration
1970	23,962,313	18,797,173	5,165,141
1975	26,051,685	21,033,802	5,017,883
1980	28,237,149	23,435,154	4,801,995
1985	30,563,833	25,874,899	4,688,936
1990	32,879,877	28,244,887	4,654,991
1995	35,072,698	30,554,419	4,518,278
2000	37,196,714	32,740,518	4,456,196
2005	39,348,500	34,948,936	4,399,561
2010	41,507,493	37,088,690	4,418,799
2015	43,593,877	39,159,514	4,434,360
2020	45,564,691	41,079,084	4,485,610
2025	47,420,931	42,887,057	4,533,874

Source: INDEC

$(\times 10^3)$

(Chart with y-axis labeled 9,000 down to 0, and curves labeled "Demand 1", "2", "Waiting list", "Trend", "Main lines")
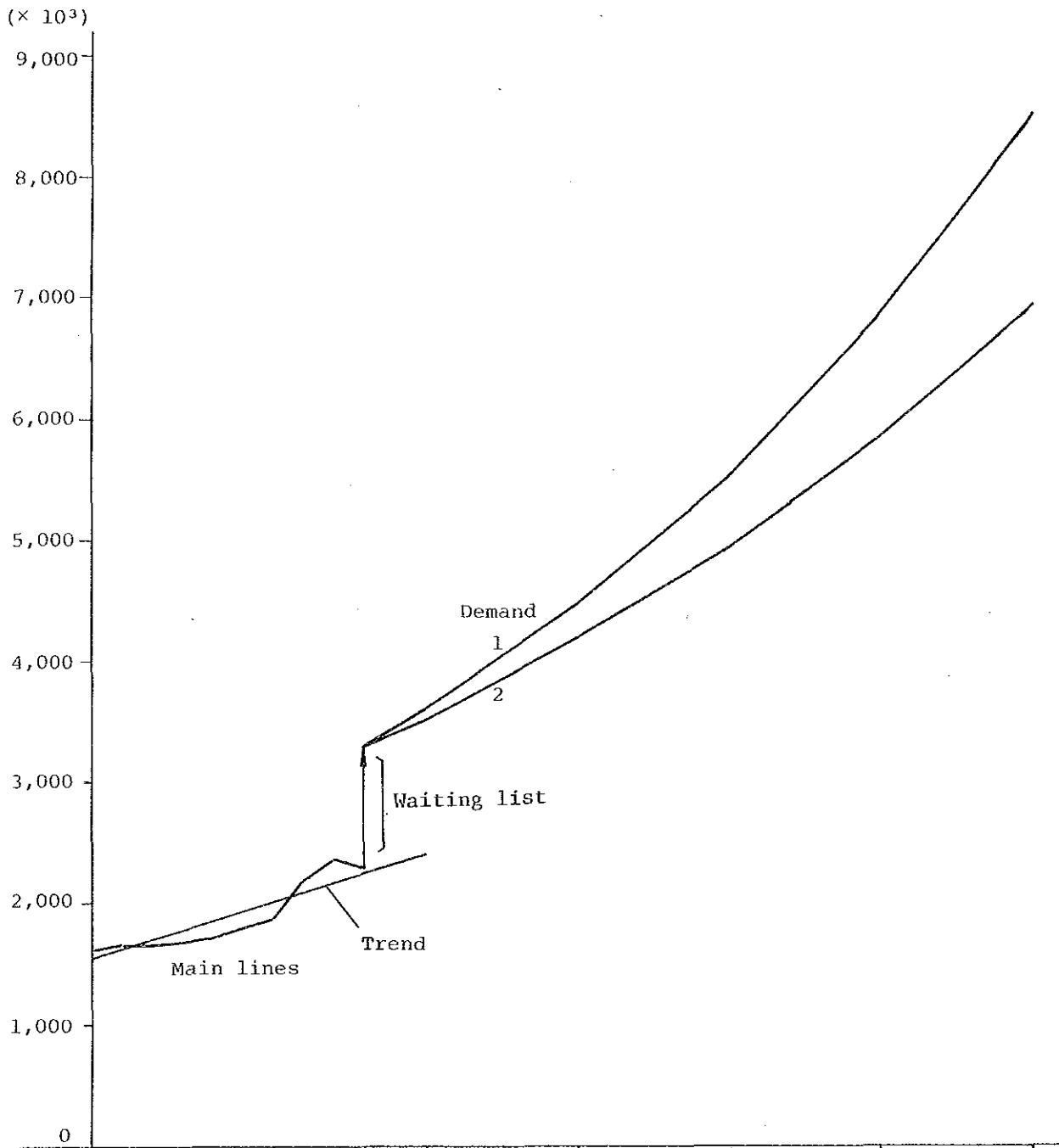
Year	1975	1980	1983	1985	1990	1995	2000	2005
Main lines	1651	1879	2272					
Waiting list			1026					
Demand forecast	Alternative 1 (4.4%/y)		3298	3595	4458	5529	6857	8499
	Alternative 2 (3.4%/y)			3528	4176	4943	5851	6925

Unit: Thousand

Fig. A – 1 – 2 Telephone demand on the nation

Appendix 2 Distribution coefficients

Shown below are the calculation bases of distribution coefficient that distribute the national macro telephone demand to the province of Mendoza.

Since the national macro telephone demand is calculated based on the income elasticity model, the same model is applied to distribute the telephone demand to the province of Mendoza as per the following procedures :

● Obtain the ratio of GDP of the province to the nation.

● Obtain GDP per capita for the nation and the province.

● Obtain main lines per 100 persons for the nation and the province.

● Obtain the number of main lines by multiplying each main lines per 100 persons for the nation and for the province by the respective population, then obtain their ratio, which is the distribution coefficient. Table A−2−1 shows the values of the above calculation.

For the share of the province of Mendoza compared to the nation, there are population and main lines ratios besides GDP per capita. Therefore, in addition to the value based on the income elasticity model, the alternatives based on *population ratio and main lines ratio are also considered for the distribution coefficient.* Table A−2−2 shows the distribution coefficients including those alternatives.

Fig. A−2−1 shows the result of distribution of the national macro telephone demand to the province of Mendoza based on these distribution coefficients.

Table A-2-1 Telephone demand distribution coefficient

Item	Share of the GDP (%)	GNP per capita (US$)	Main lines per 100 persons	Population (10³)	Main lines (10³)	Tel. demand distribution coefficient
Argentina	100	2,510	7.58	30,564	2,317	–
Mendoza	Max. 4.6	2,710	8.28	1,302	108	4.7
	Mean 3.91	2,304	6.87		89	3.8
	Min. 3.24	1,909	5.53		72	3.1

Source: Share of the GDP: P229 ANUARIO ESTADISTICO MENDOZA 1981 ~ 1984
            TOMO I

No. of main lines per 100 persons =
            $0.00091887*(GNP\ per\ capita)^{1.151954}$: Fig. B-1-1

Table A-2-2 Alternatives of the telephone demand distribution coefficient

Item	Telephone demand distribution coefficient	Note
Alternative a	3.8%	Demand distribution using in-come elasticity model
Alternative b	4.3%	Demand distribution depend on the population
Alternative c	3.3%	Demand distribution using the main lines' ratio between the nation and the province

x 10³

Demand
b

a

c

Existed demand
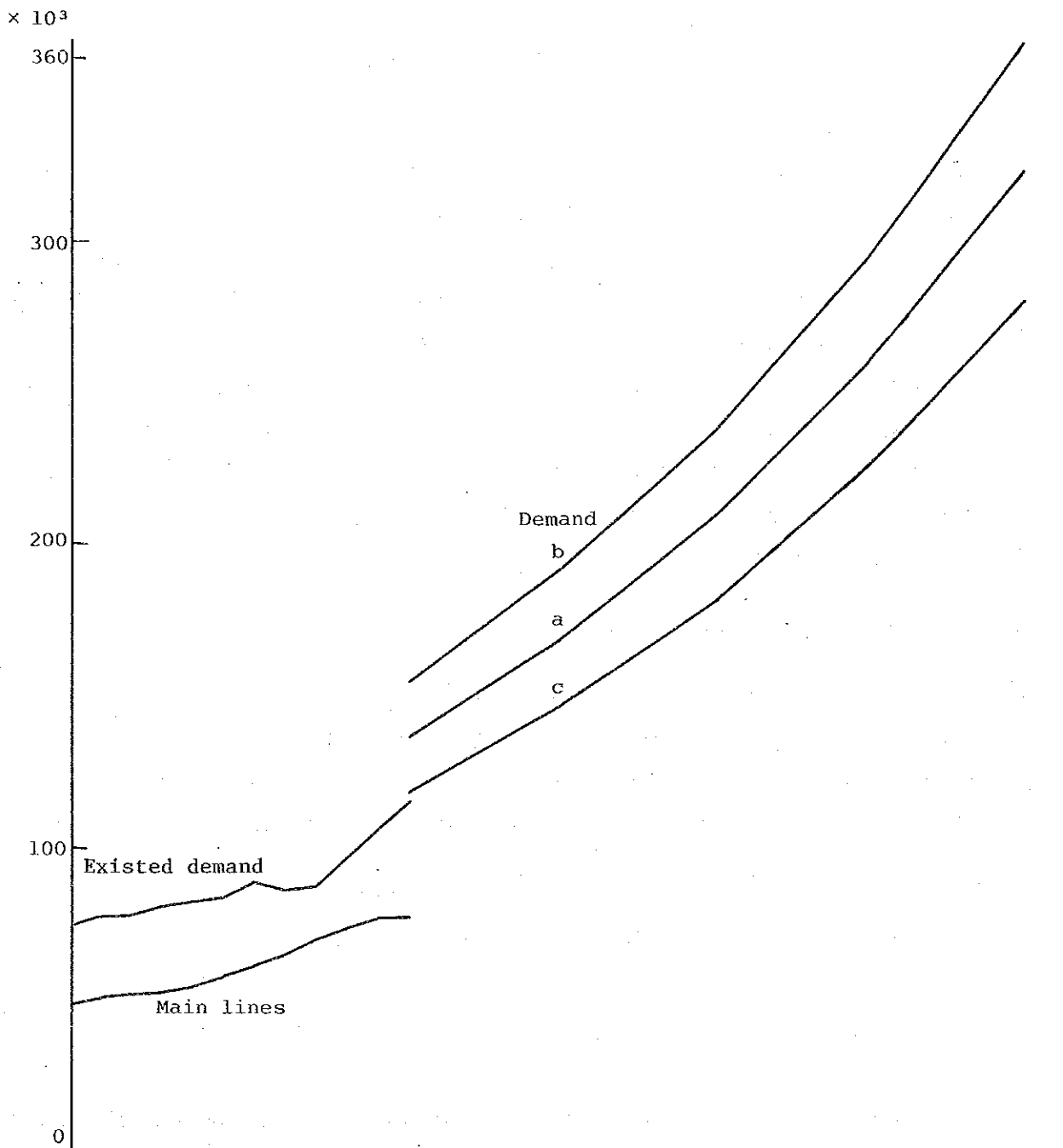
Main lines

End of year	1975	1980	1985	1990	1995	2000	2005
Main lines	50,593	61,250	78,296				
Total demand	77,845	89,035	115,852				
Demand forecast (10³) Alternative a (3.8%)			137	169	210	261	323
Demand forecast (10³) Alternative b (4.3%)			155	192	238	295	365
Demand forecast (10³) Alternative c (3.3%)			119	147	182	226	280

Unit: Thousand

Fig. A – 2 – 1 Telephone demand in the province of Mendoza

Appendix 3 Distribution coefficients by exchange

The telephone demand depends on the quality of telephone service presently provided to the public. That is, it is known that the telephone damand increases with the improvements of service such as automatization of manual exchanges, and the provision of general subscriber's service to areas where the service is provided only with public telephone booths. With regard to this effect of improvements in services on the telephone demand, data from the year 1971 through 1985 are analyzed. Although only approximate, the ratio of increase in telephone demand according to the pattern of service improvement is determined as shown below. Using those ratios, the distribution coefficients by individual exchange is obtained for the final forecast year when every exchange becomes automatic.

(1) Effect by the improvement of service

Table A—3—1 shows the results, which are classified into exchanges with remarkable increase of telephone demand, exchanges without obvious effects apart from spontaneous increase, and others. Figs. A—3—1 through A—3—6 show examples of data analyzed on individual exchanges and the effect of improvements of services.

(2) Rate of increase of telephone demand

The effect of the improvement in telephone service differs by individual exchange as stated above, and may be summarized as follows :

If a manual exchange is replaced to an automatic exchange, the telephone demand doubles, and if new exchange areas, that are served by public telephone booths, are established by manual exchange, telephone demand occurs twenty.

(3) Distribution coefficients by exchange

In the final forecast year when every exchange becomes automatic, if the telephone demand occurs as described in the preceding Section (2), the ratio of telephone demand by individual exchange, or distribution coefficients by exchange, become as shown in Table A—3—2.

Table A – 3 – 1   Service improvement effect

Unit: Central office and public
telephone service station

| Item | Type of service improvement | | | | | |
| | Increase of exchange capacity | | Change of exchange type | | | Unchanged |
	Auto. ex.	Manual ex.	Manual to auto.	Local bat. to common bat. (BL–BC)	Public phone to manual ex.	
Total	7	5	8	6	8	11
P*1	2*4	2*7	5*10	6*13	8*14	
Q*2	4*5	2*8	2*11			9*15
R*3	1*6	1*9	1*12			2*16

*1   Central offices where the telephone demand increased remarkably.

*2   Central offices where the telephone demand did not increase more than

*3   Others

*4   Maipu, San Rafael

*5   Chacras de Coria, Lujan de Cuyo, Rivadavia, San Martin

*6   Rodeo del Medio

*7   Junin, Vista Flores

*8   La Consulta, La Paz

*9   Monte Coman

*10   Rodeo de la Cruz, Palmira, E. Bustos, Malargue, Lavalle

*11   Tunuyan, Tupungato

*12   F.L. Beltran

*13   F.L. Beltran, Rodeo de la Cruz, Palmira, Malargue, Cruz de Piedra, Medrano

*14   Agrelo, Campamentos, Chapanay, Tres Portenas, Chilecito, Pareditas, 25 de Mayo, Costa de Araujo

*15   Potrerillos, Canada Seca, El Nihuil, Gouge, La Llave, Las Malvinas, Rama Caida, Santa Rosa, Las Catitas

*16   Campo los Andes, La Dormida

Note: Because of the frequent change of the exchange service area on the multiple exchange area, the exchange offices on that area are excluded in this analysis.

$$Y = A + B \times T$$

$$A = 733.4 \qquad B = 201.525$$
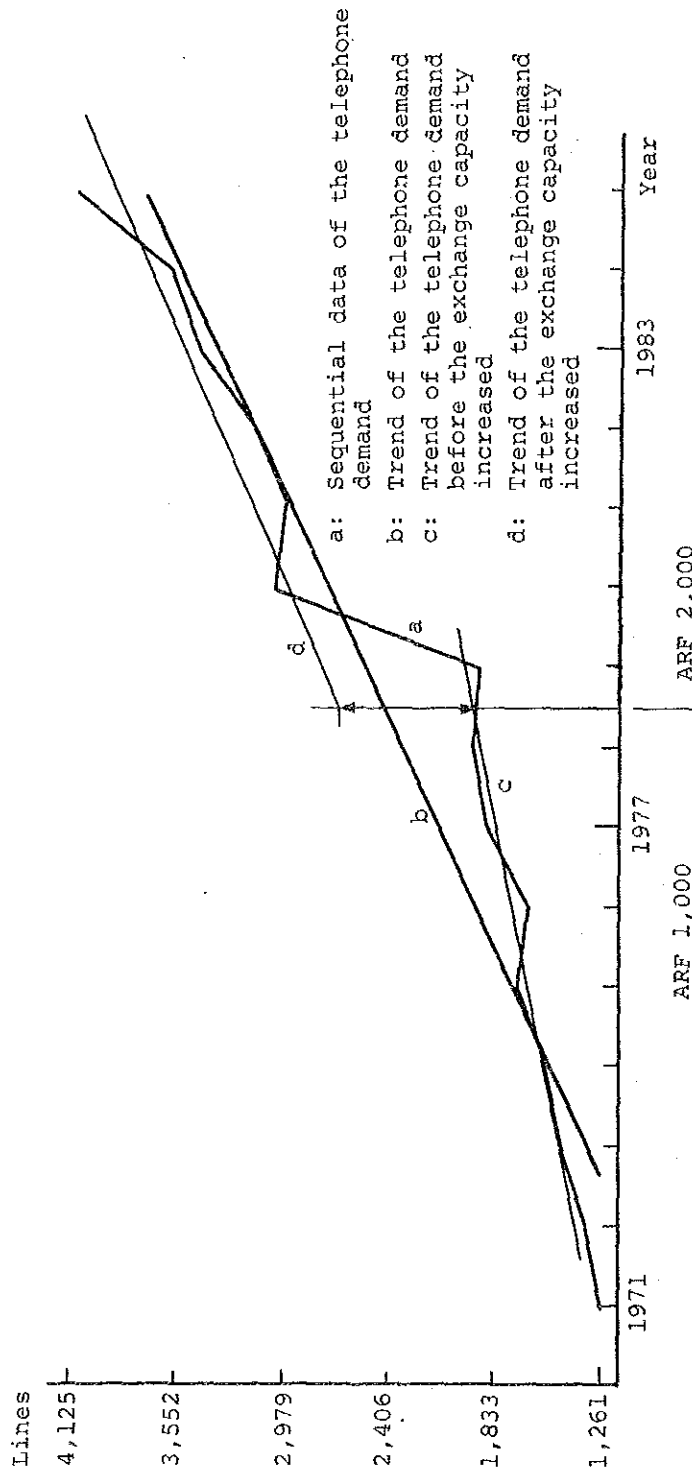
a: Sequential data of the telephone demand

b: Trend of the telephone demand

c: Trend of the telephone demand before the exchange capacity increased

d: Trend of the telephone demand after the exchange capacity increased

Year	+0	+1	+2	+3	+4
1971	1,261	1,349	1,477	1,568	1,710
1976	1,667	1,890	1,959	1,935	3,057
1981	2,977	3,151	3,448	3,610	4,125

Fig. A − 3 − 1 Telephone demand increase in Maipu

$$Y = A + B \times T$$

$$A = 118.619 \qquad B = 70.5393$$

a: Sequential data of the telephone demand

b: Trend of the telephone demand

c: Trend of the telephone demand before the exchange capacity increased

d: Trend of the telephone demand after the exchange capacity increased

Year	+0	+1	+2	+3	+4
1971	313	355	405	419	444
1976	471	426	601	684	833
1981	799	878	914	1,270	1,432
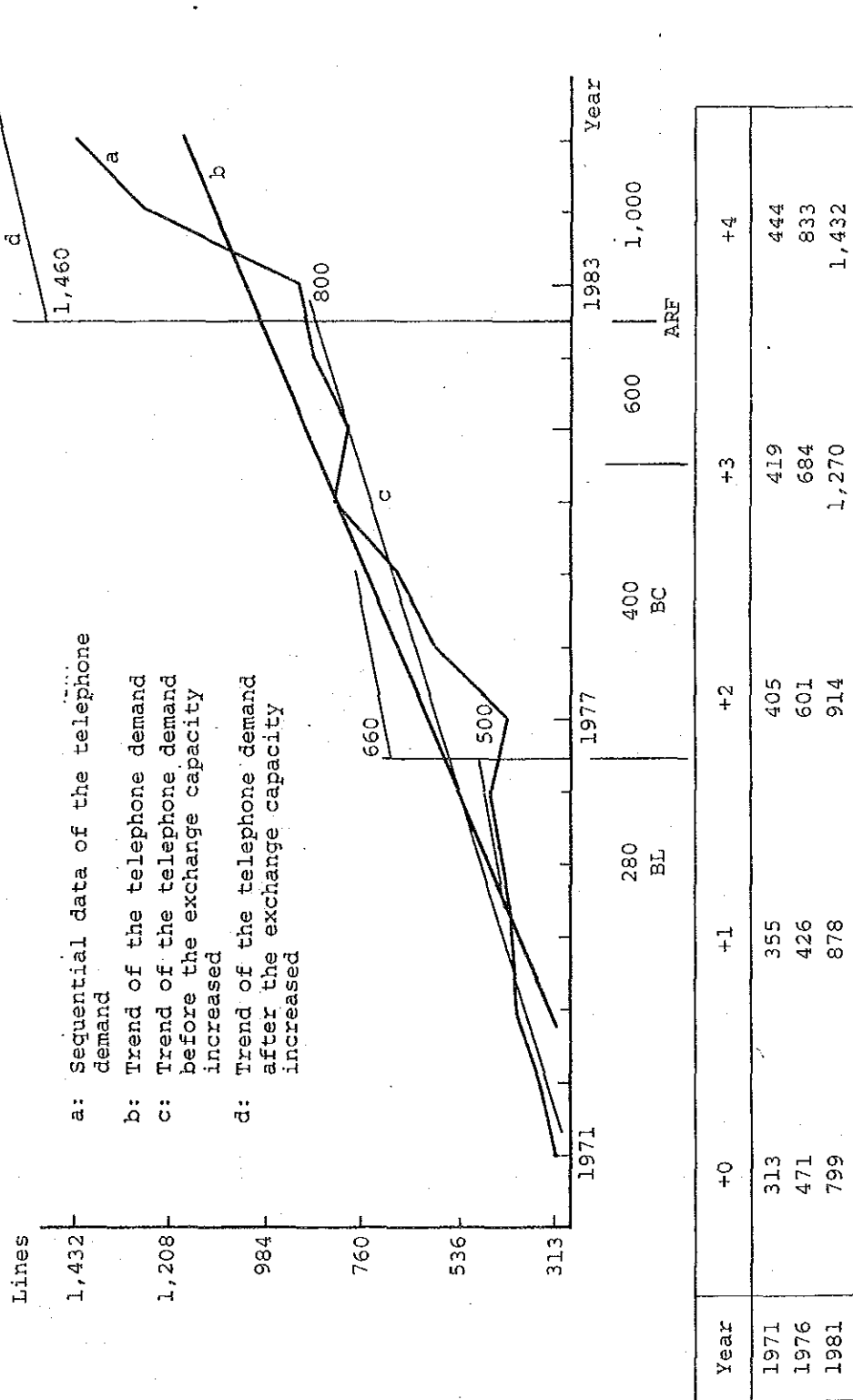
Fig. A-3-2 Telephone demand increase in Palmira

$$Y = A + B \times T$$

$$A = -155.419 \qquad B = 73.5357$$
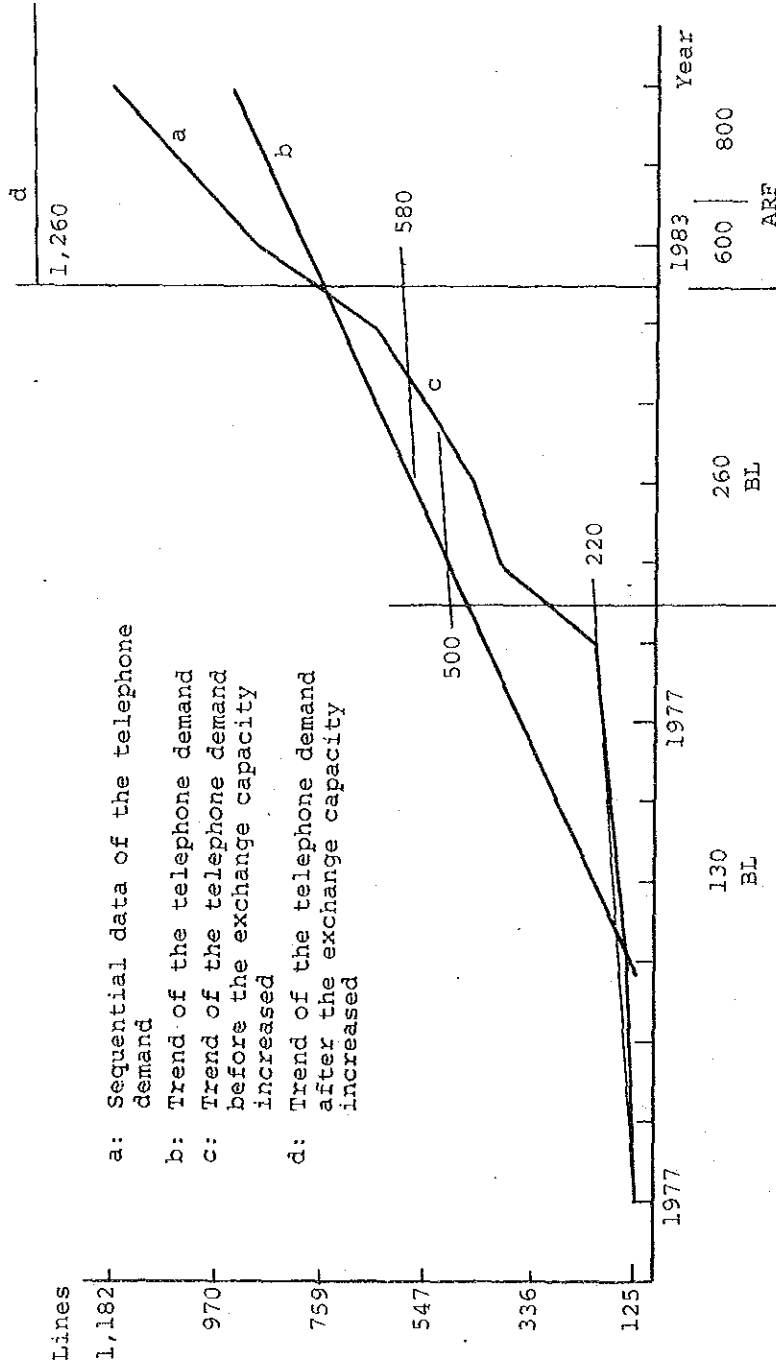
a: Sequential data of the telephone demand
b: Trend of the telephone demand
c: Trend of the telephone demand before the exchange capacity increased
d: Trend of the telephone demand after the exchange capacity increased

Year	+0	+1	+2	+3	+4
1971	125	136	142	144	162
1976	188	191	215	404	454
1981	549	661	897	1,043	1,182

Fig. A－3－3 Telephone demand increase in Malargue

$$Y = A + B \times T$$

$$A = 16.2762 \qquad B = 4.60714$$

Lines axis: 93, 80, 67, 54, 41, 29

a: Sequential data of the telephone demand
b: Trend of the telephone demand
c: Trend of the telephone demand before the exchange capacity increased
d: Trend of the telephone demand after the exchange capacity increased

Year	+0	+1	+2	+3	+4
1971	29	31	34	33	31
1976	34	41	45	81	68
1981	72	71	71	93	87
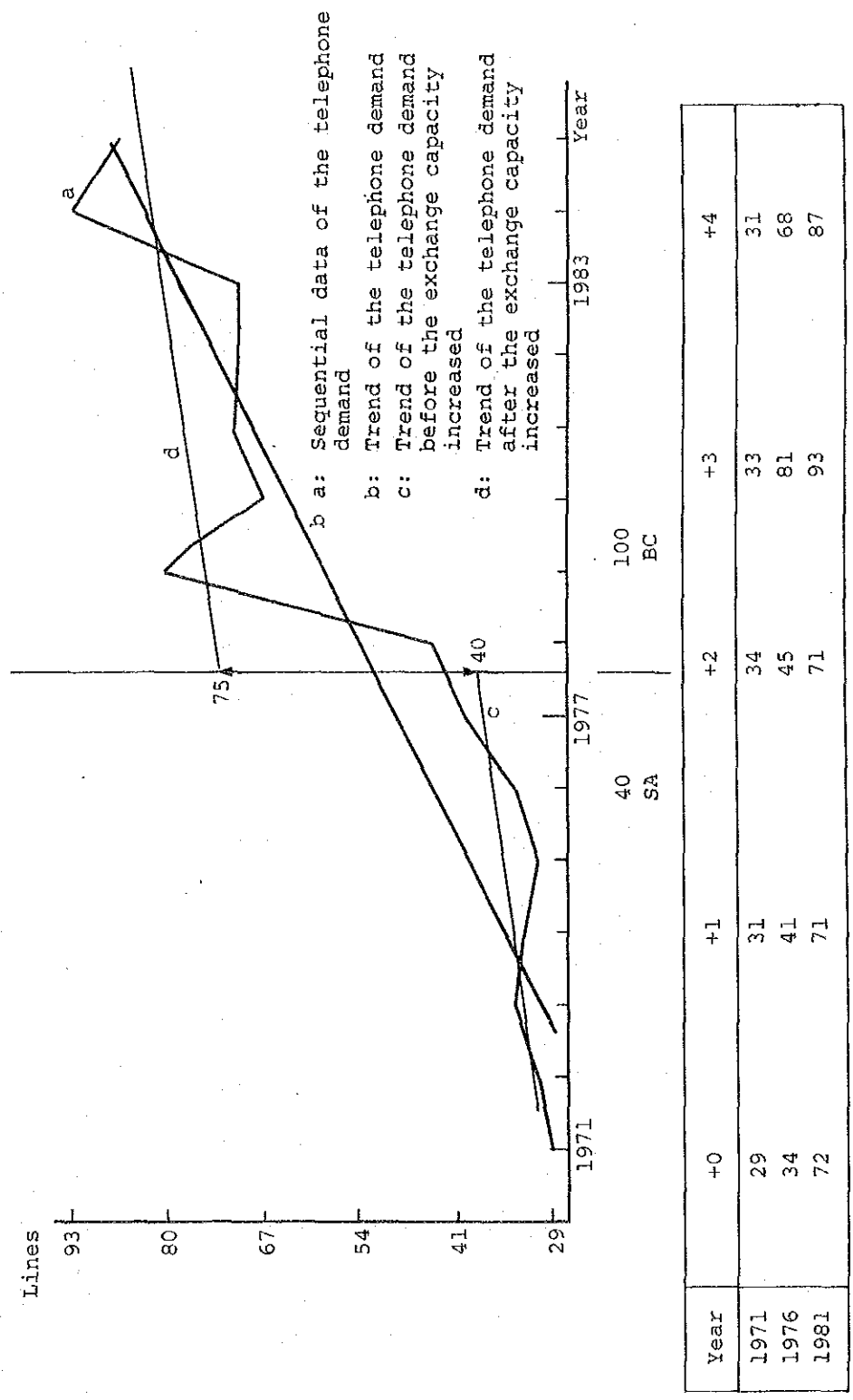
Fig. A−3−4 Telephone demand increase in Cruz de Piedra

$$Y = A + B \times T$$

$$A = -6.75 \qquad B = 1.41176$$
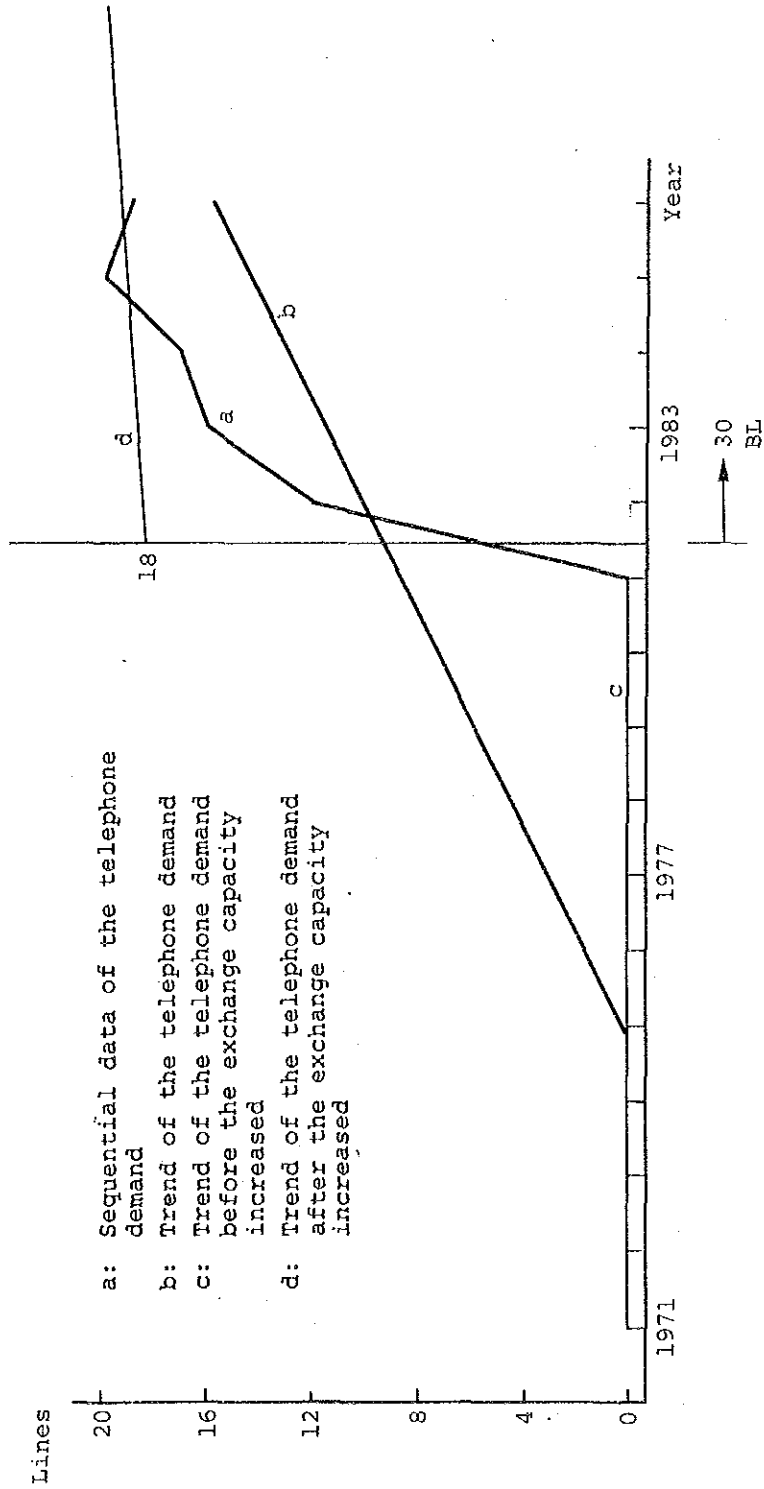
a: Sequential data of the telephone demand
b: Trend of the telephone demand
c: Trend of the telephone demand before the exchange capacity increased
d: Trend of the telephone demand after the exchange capacity increased

Year	+0	+1	+2	+3	+4
1971	0	0	0	0	0
1976	0	0	0	0	0
1981	0	12	16	17	20
1986	19				

Fig. A−3−5. Telephone demand increase in Campamentos

$$Y = A + B \times T$$

A = 1,071.64 B = 98.3786

a: Sequential data of the telephone demand
b: Trend of the telephone demand
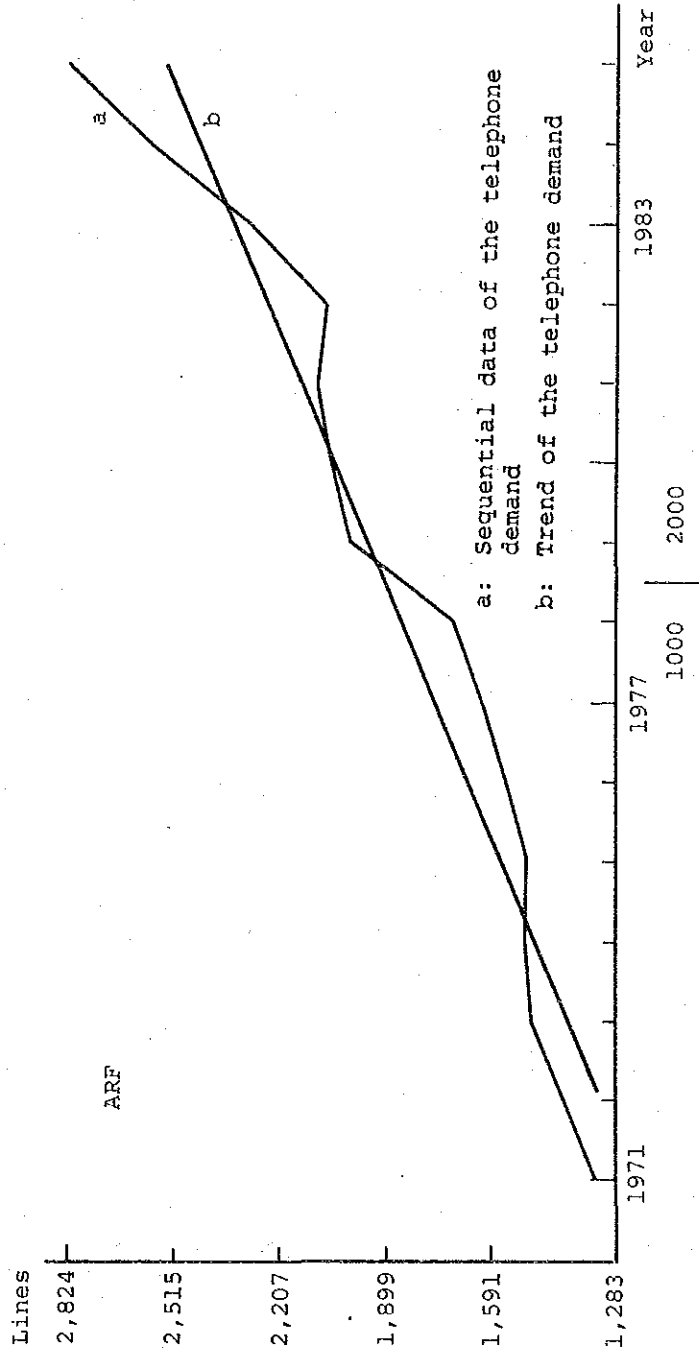
Year	+0	+1	+2	+3	+4
1971	1,283	1,378	1,473	1,494	1,494
1976	1,555	1,617	1,695	1,994	2,048
1981	2,083	2,057	2,300	2,585	2,824

Fig. A – 3 – 6 Telephone demand increase in Lujan de Cuyo

Table A-3-2 Telephone demand distribution coefficient to the zone and exchange area (1/4)

Zone or exchange area	Telephone demand		Distribution coefficient
	1985	Adjusted value	
Province	119,547	122,830	1
1. Gran Mendoza	93,115	93,535	0.7614
1.1 Multiple exchange area	82,876	82,876	0.6748
Gral. Paz	19,099	–	0.1555
Correo	15,108	–	0.123
Dorrego	4,897	–	0.0399
Godoy Cruz	12,345	–	0.1005
Hipodromo	5,291	–	0.0431
Las Heras	11,020	–	0.0897
Loria	4,416	–	0.036
Villa Nueva	10,700	–	0.0871
1.2 Gran Mendoza	10,239	10,659	0.0866
Chacras de Corea	1,219	–	0.0099
Lujan de Cuyo	2,833	–	0.0231
Agrelo	16	32	0.0003
Blanco Encalada	45	40	0.0003
El Carrizal	4	40	0.0003
Ugarteche	15	40	0.0003
Rodeo de la Cruz	1,090	–	0.0089
Flay L. Beltran	321	–	0.0026
Maipu	4,145	–	0.0337
Rodeo del Medio	393	–	0.0032
Cruz de Piedra	87	174	0.0014
El Pastral	1	40	0.0003
La Primavera	1	40	0.0003
Col. Segovia	1	40	0.0003
Puente de Hierro	1	40	0.0003
Potrerillos	49	98	0.0008
Uspallata	17	34	0.0003
Las Cuevas	1	40	0.0003

Table A – 3 – 2 Telephone demand distribution coefficient to the zone and exchange area (2/4)

Zone or exchange area	Telephone demand		Distribution coefficient
	1985	Adjusted value	
2. Este	9,181	9,726	0.0789
Junin	295	590	0.0048
Medrano	64	128	0.001
Rivadavia	1,900	–	0.0155
Campamentos	20	40	0.0003
Reduccion	14	28	0.0002
San Martin	5,219	–	0.0425
Palmira	1,441	–	0.0117
Chapanay	13	26	0.0002
Tres Portenas	57	114	0.0009
La Central	44	40	0.0003
Philipps	39	40	0.0003
Alto Verde	13	40	0.0003
N. California	60	40	0.0003
Rodrigues Pena	1	40	0.0003
Ing. Giagnoni	1	40	0.0003
3. Noreste	652	1,264	0.0102
Lavalle	178	–	0.0015
Costa de Araujo	27	54	0.0004
Gustavo Andre	1	40	0.0003
Jocoli	3	40	0.0003
Tres de Mayo	6	40	0.0003
Santa Rosa	64	128	0.001
La Dormida	85	170	0.0014
Las Catitas	53	106	0.0009
La Paz	234	468	0.0038
Desaguadero	1	40	0.0003

Table A − 3 − 2 Telephone demand distribution coefficient to the zone and exchange area (3/4)

Zone or exchange area	Telephone demand		Distribution coefficient
	1985	Adjusted value	
4. Centro Oeste	2,720	3,468	0.0281
E. Bustos	286	−	0.0023
Chilecito	26	52	0.0004
La Consulta	422	844	0.0069
Pareditas	28	56	0.0005
Tunuyan	1,295	−	0.0105
Campo los Andes	37	74	0.0006
Vista Flores	87	174	0.0014
San Pablo	1	40	0.0003
Zapata	1	40	0.0003
Tupungato	527	−	0.0043
El Zampal	9	40	0.0003
San J. de Tupungato	1	40	0.0003

Table A – 3 – 2 Telephone demand distribution coefficient to the zone and exchange area (4/4)

Zone or exchange area	Telephone demand		Distribution coefficient
	1985	Adjusted value	
5. Sur	13,879	14,837	0.1205
San Rafael	9,656	-	0.0786
Canada Seca	39	78	0.0006
25 de Mayo	19	38	0.0003
El Nihuil	11	22	0.0002
Gouge	9	18	0.0001
La Llave	26	52	0.0004
Las Malvinas	4	8	0.0001
Monte Coman	65	130	0.0011
Rama Caida	18	36	0.0003
Cuadro Benegas	29	40	0.0003
El Chacay	1	40	0.0003
El Sosneado	1	40	0.0003
Villa Atuel	156	312	0.0025
Real del Padre	87	174	0.0014
Gral. Alvear	2,323	-	0.0189
Bowen	176	352	0.0029
Carmensa	37	74	0.0006
Jaime Prats	27	54	0.0004
Andes	1	40	0.0003
Escandinava	1	40	0.0003
La Guevarina	1	40	0.0003
La Materina	1	40	0.0003
Las Aguaditas	1	40	0.0003
Malargue	1,190	-	0.0097

Source: NOMIVA DE CENTRALES Y CABINAS CON INDICACION
DE SISTEMA, LINEAS INSTALADAS, LINEAS Y APARATOS
EN SERVICIO Y PEDIDOS PENDIENTES REGISTRADOS AL
31 de diciembre de 1985

Appendix 4 Estimation of telephone demand by sequential data and input-output table and economic and population data

1. Estimation of telephone demand over time

Based on the trends from the years 1971 through 1985, the telephone demands for the province of Mendoza and for each area are estimated. Table A—4—1 shows the result. Figs. A—4—1 through A—4—7 show the transitions of telephone demand by area.

The transition of the number of main lines is calculated with the following equation :

$$y = 40{,}529.6 \times 1.0449^{t}$$

Where y : Number of main lines

$t = T - 1970$

Where T : Year

The following conclusions are obtained based on the result of the estimation over time :

— The province macro telephone demand has been increasing at an annual average rate of 3.5%.

— The average annual rate of increase of main lines is 4.5%.

— Since the increase rate for main lines exceeds that of telephone demand, waiting list have been gradually decreasing. However, at the present pace, an equilibrium of demand and supply will not be reached until around the year 2020, even later if the demand increases more rapidly than the present average.

Table A – 4 – 1 Telephone demand estimation by sequential data

Area	Estimation formula	Telephone demand (1,000)		
		1995	2000	2005
Province	$y = 62959.1 \times 1.03543^t$	150	179	213
Multiple exchange area	$y = 50916.9 \times 1.02696^t$	99	113	129
Gran Mendoza	$y = 3196.99 \times 1.07662^t$	20	29	42
East	$y = 3499.01 \times 1.06042^t$	15	20	27
Northeast	$y = 223.257 \times 1.07181^t$	1.3	1.8	2.5
Centro-west	$y = 1360.81 \times 1.04243^t$	3.8	4.7	5.8
South	$y = 3953.74 \times 1.06261^t$	18	24	33

$t = T-1970$

T: Year

Tel. demand

$Y = A \times B^T$

$A = 62,959.1$ $B = 1.03543$

a: Sequencial data of the telephone demand

b: Trend of the sequential data
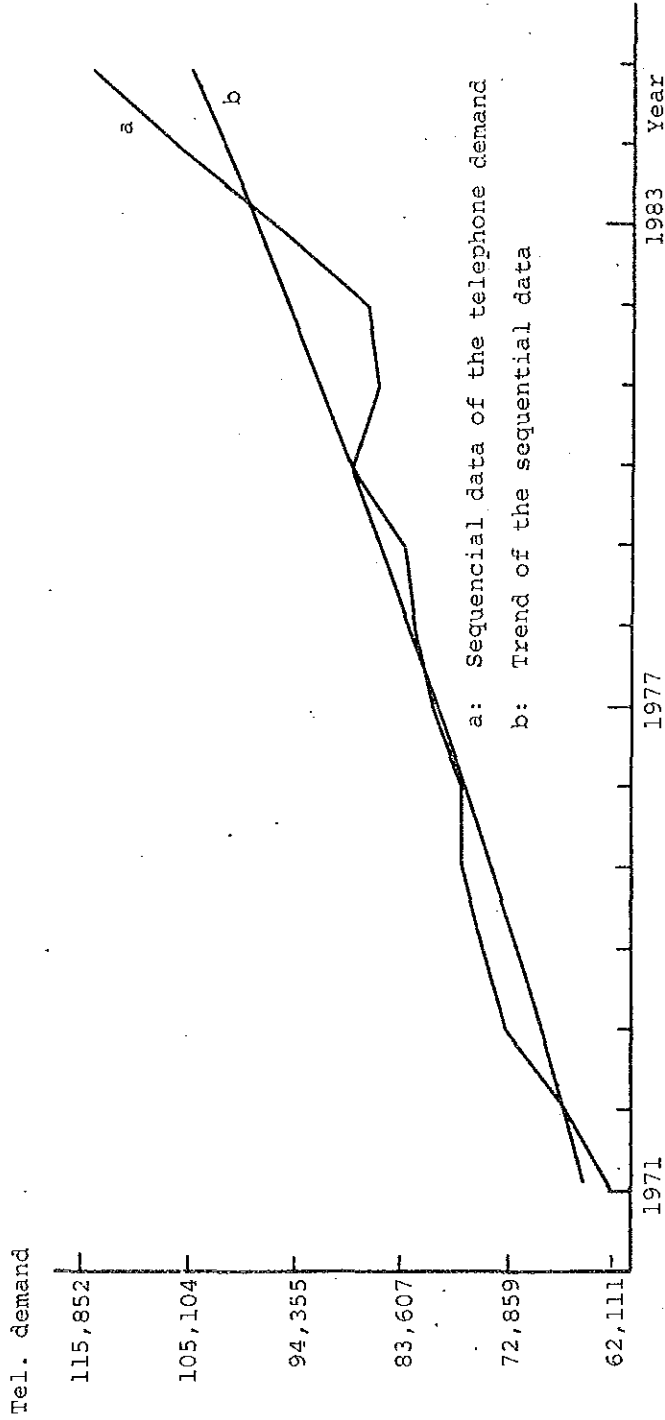
Year	+0	+1	+2	+3	+4
1971	62,111	67,209	73,252	75,565	77,845
1976	77,862	80,804	82,536	83,866	89,035
1981	86,223	87,449	96,643	107,218	115,852

Fig. A-4-1 Telephone demand in the province of Mendoza

$$Y = A \times B^T \qquad A = 50{,}916.9 \qquad B = 1.02696$$

Tel. demand

a: Sequencial data of the telephone demand

b: Trend of the sequential data
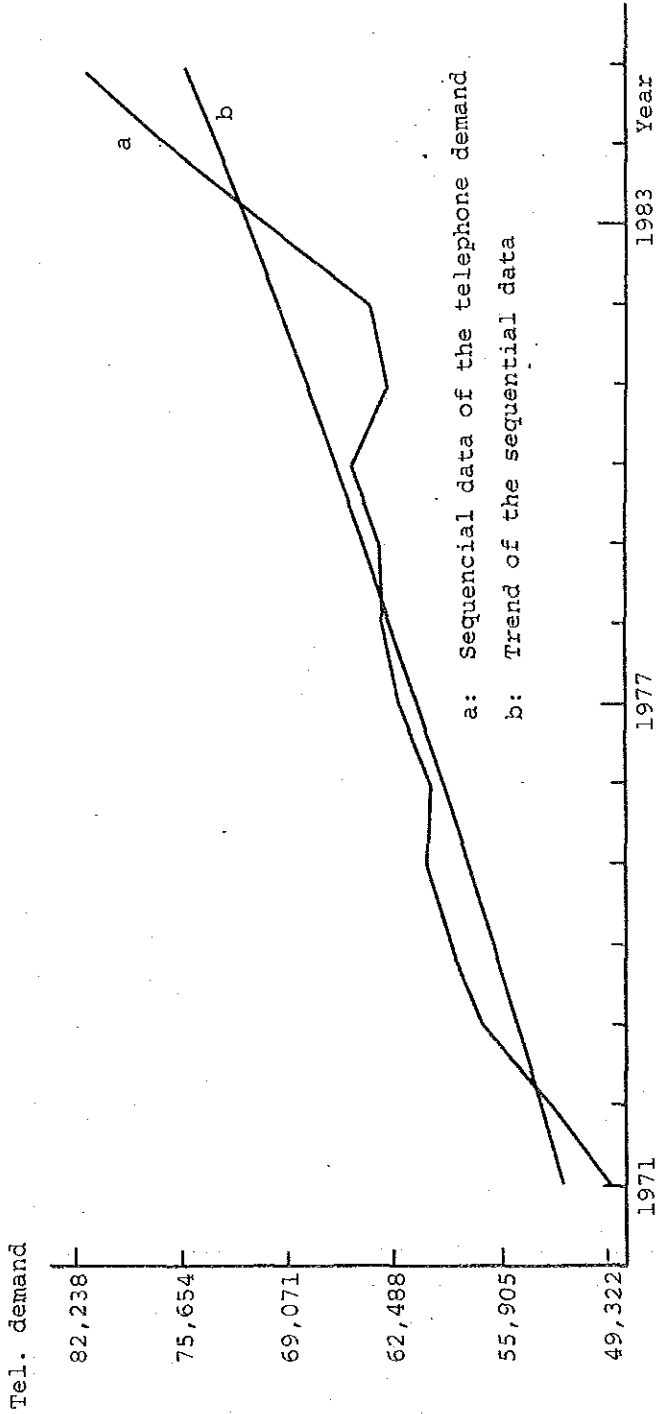
Year	+0	+1	+2	+3	+4
1971	49,322	53,013	57,351	59,341	60,719
1976	60,628	62,466	63,385	63,510	65,449
1981	63,169	64,212	70,553	76,865	82,238

Fig. A−4−2 Telephone demand in the multiple exchange area

$$Y = A \times B^T$$

$$A = 3{,}196.99 \qquad B = 1.07662$$

a: Sequencial data of the telephone demand

b: Trend of the sequential data
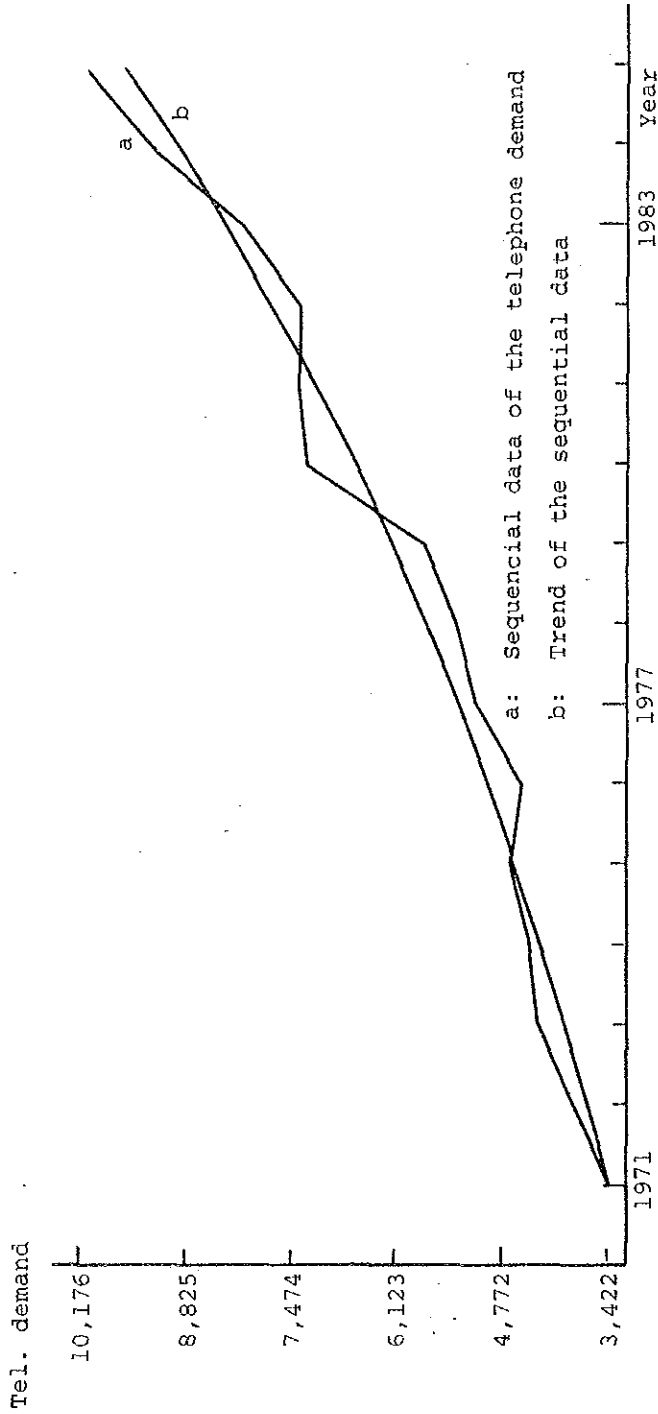
Year	+0	+1	+2	+3	+4
1971	3,422	3,850	4,287	4,406	4,669
1976	4,527	5,139	5,401	5,805	7,306
1981	7,438	7,393	8,124	9,312	10,176

Fig. A – 4 – 3 Telephone demand in the area "Gran Mendoza"
(Excluding multiple exchange area)

$$Y = A \times B^T$$

$$A = 3,499.01 \qquad B = 1.06042$$

a: Sequencial data of the telephone demand

b: Trend of the sequential data
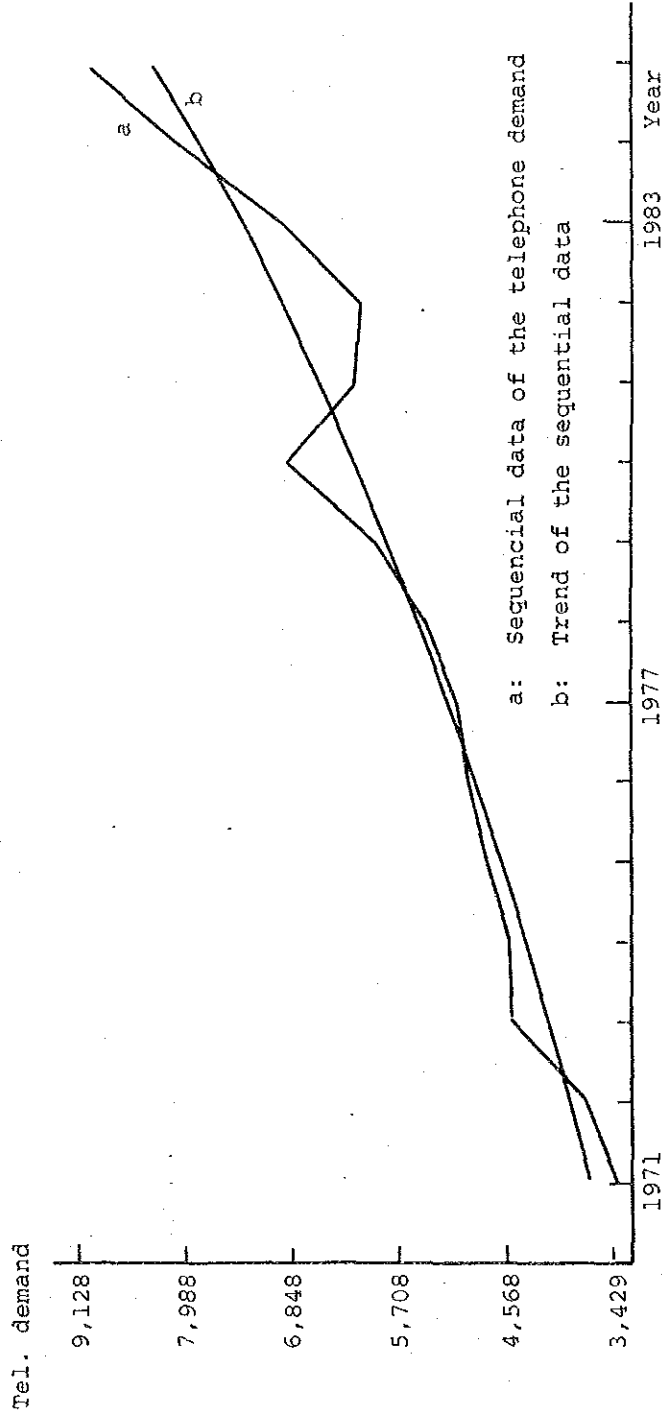
Year	+0	+1	+2	+3	+4
1971	3,429	3,788	4,565	4,600	4,841
1976	5,027	5,191	5,521	6,038	6,991
1981	6,279	6,228	7,046	8,154	9,128

Fig. A-4-4 Telephone demand in the area "Este"

Tel. demand

$Y = A \times B^T$

$A = 223.257 \qquad B = 1.07181$

a: Sequencial data of the telephone demand

b: Trend of the sequential data
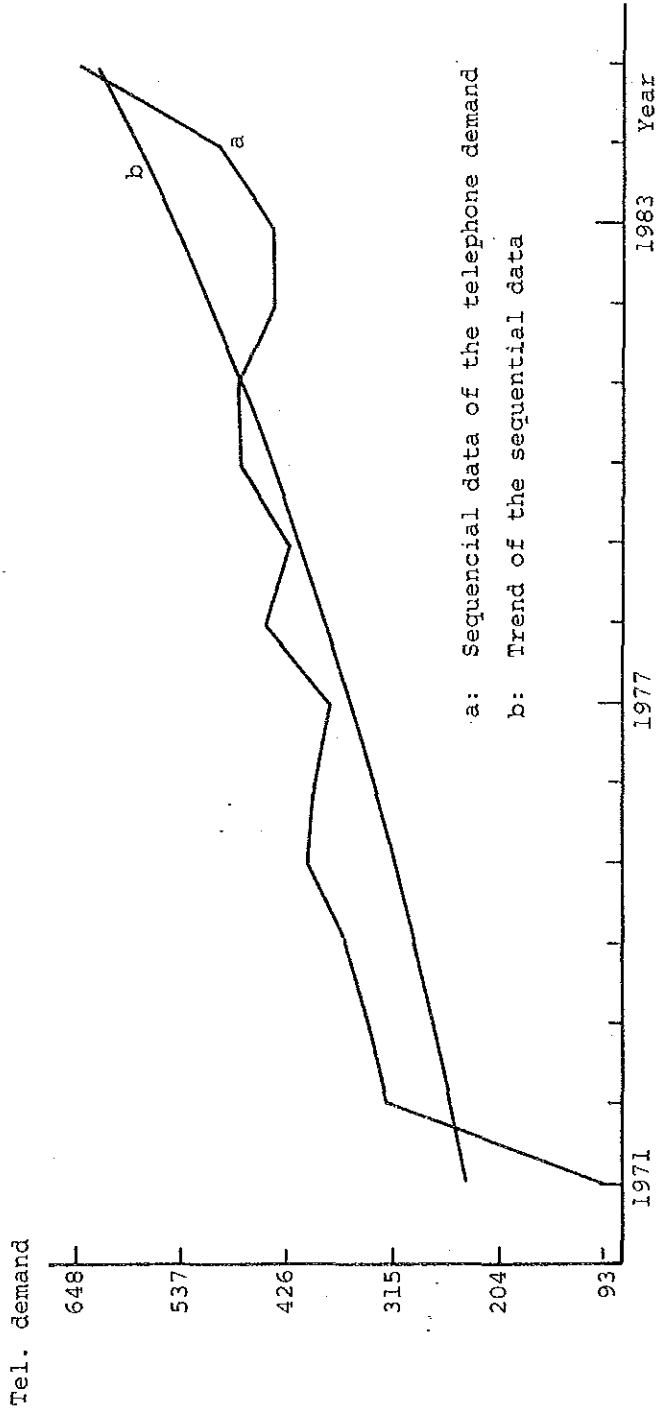
Year	+0	+1	+2	+3	+4
1971	93	325	342	367	406
1976	398	383	453	430	482
1981	485	446	449	506	648

Fig. A–4–5 Telephone demand in the area "Nor Este"

$$Y = A \times B^T \qquad A = 1{,}360.81 \qquad B = 1.04243$$

Tel. demand

2,700
2,419
2,138
1,858
1,577
1,297

1971   1977   1983 Year

a: Sequencial data of the telephone demand

b: Trend of the sequential data
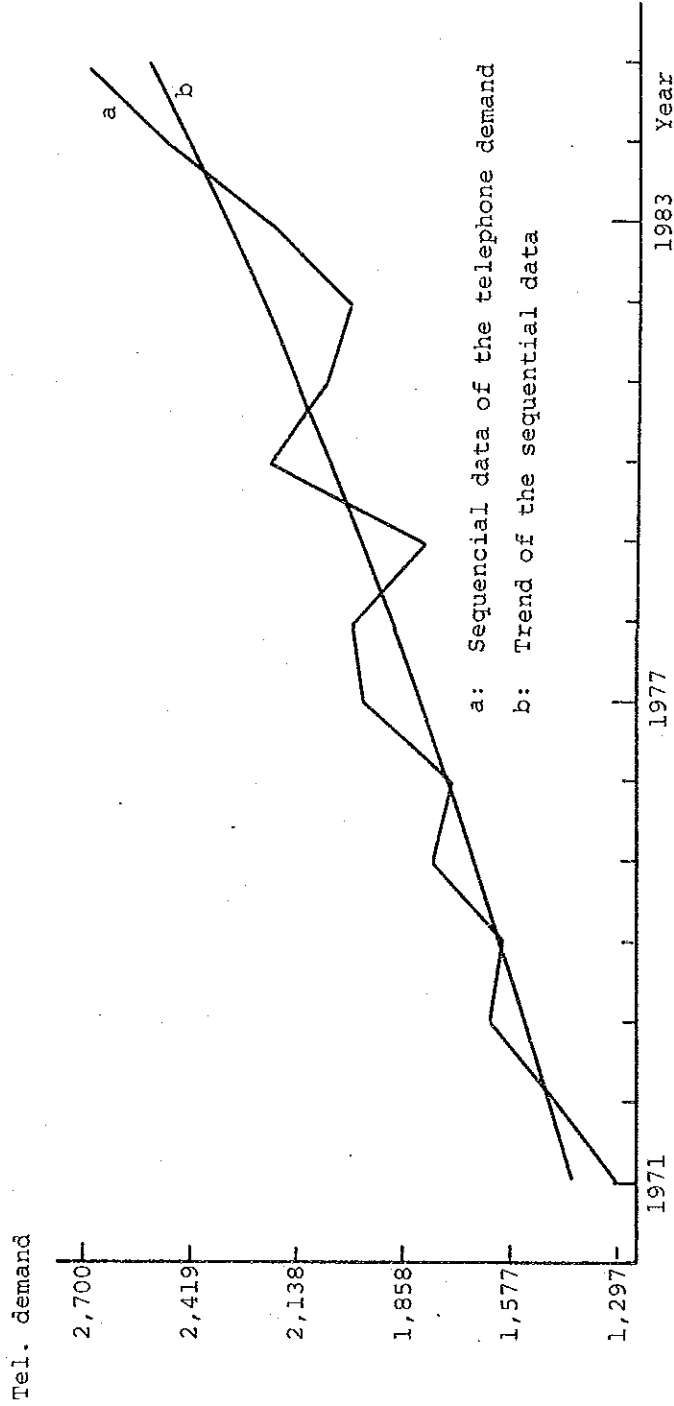
Year	+0	+1	+2	+3	+4
1971	1,297	1,456	1,634	1,599	1,781
1976	1,736	1,963	2,001	1,808	2,220
1981	2,074	2,006	2,217	2,483	2,700

Fig. A–4–6 Telephone demand in the area "Centro Oeste"

$$Y = A \times B^T \qquad A = 3,953.74 \qquad B = 1.06261$$

a: Sequencial data of the telephone demand

b: Trend of the sequential data

Year	+0	+1	+2	+3	+4
1971	4,534	4,765	5,056	5,249	5,427
1976	5,536	5,661	5,825	6,419	6,588
1981	6,838	7,143	8,253	9,911	13,741
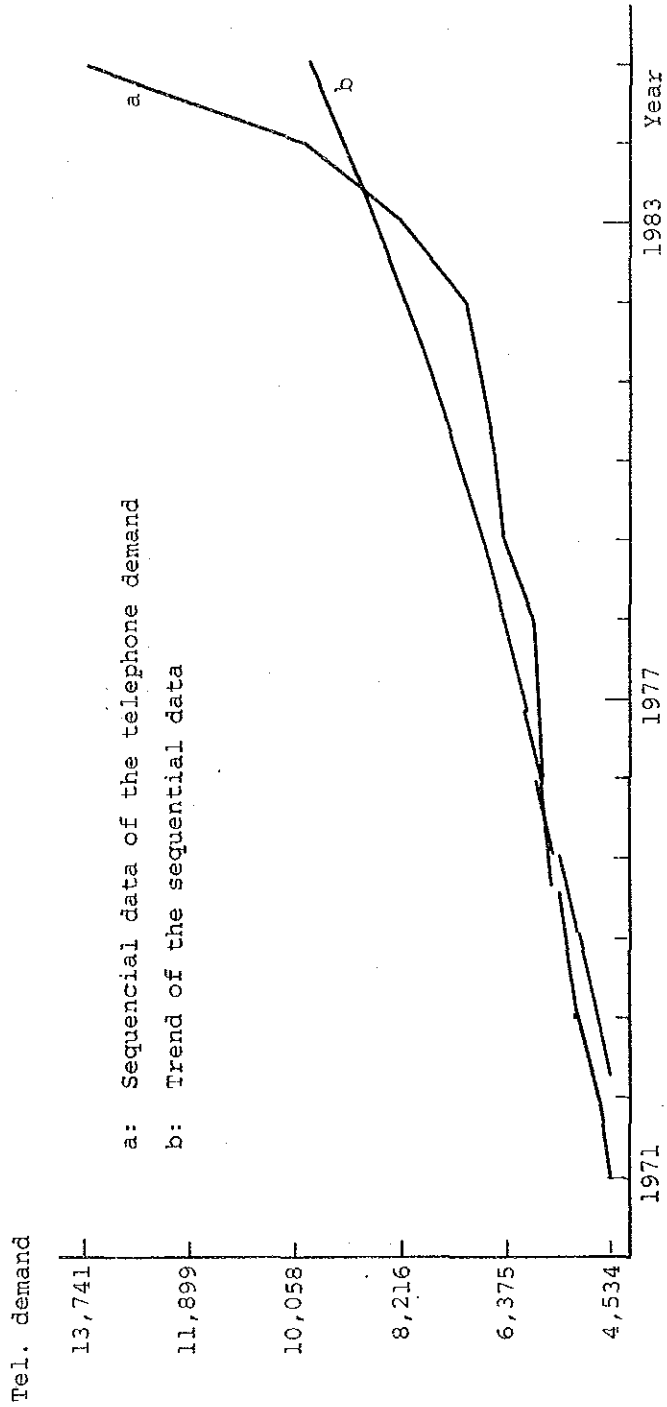
Fig. A－4－7 Telephone demand in the area "Sur"

2. Estimation of the national macro telephone demand according/ to input — output table

Telephone demand is estimated based on two input—output (hereinafter denoted to as I/O) tables for the years 1963 and 1973 according to the following procedures :

1) Creation of large classification

The I/O table for 1963 is classified into 23 divisions and the I/O table for 1973 into 57 divisions. Those are too detailed to use for estimation of macro demand, so the data is regrouped in a large classification table with nine divisions, often used for Argentina's economic statistics. (Since the items of transportation and communication are further divided into transportation, mail and telegram, and telephone in accordance with the purpose of use, the total number of divisions increased from nine to 11).

2) Correction of input coefficients

According to the I/O table for 1963, the transportation and communication divisions are integrated, and according to the I/O table for 1973 the mail and telegram division is integrated with the telephone division. Since the transportation division occupies approximately 90% of the total of those divisions, the input coefficients are altered based on the experience in Japan to lessen the influence of the transportation division.

3) Estimation of the GDP by kind of economic activity in the forecast year

Since no long—term forecast data on Argentina's GDP applicable to the development plan is available, the data, as shown in the "Economic Divelopment and Growth Project 1985—1989", is applied to calculate the GDP by kind of economic activity for the forecast year, by assuming that the growth rate would continue after the base year.

4) Telephone incomes for demand estimation

Telephone incomes are estimated based on the individual GDPs by kind of economic activity, input coefficients, value—added coefficients and family consumptions.

The telephone incomes for demand estimation are shown in Table A—4—2. In order to use this demand estimation method, the I/O tables of the large classification, and input coefficients tables are shown in Tables A—4—3 and A—4—4. Numerical values used for the telephone income estimation and estimated GDP values for the forecast years are also shown in Tables A—4—5 and A—4—6.

The following conclusion is obtained from the result of the estimation.

— The average annual rate of increase of telephone income is 5.5%.

Note : If average telephone income (converted into 1970 constant prices) per main line in the year 1985 is available, the telephone demands for the forecast years are made by dividing the telephone income by the average telephone income per main line.

Table A - 4 - 2 Telephone income for demand estimation

Unit: Thousands pesos

	Item	1985	1995	2000	2005
1.	Agriculture	3.248	4.408	5.134	5.981
2.	Mining	1.224	1.994	2.545	3.248
3.	Manufacturing	16.718	28.020	36.276	46.963
4.	Electricity	.967	1.575	2.010	2.565
5.	Construction	2.208	3.955	5.293	7.083
6.	Commerce	5.836	8.075	9.498	11.172
7.	1 Transport	6.968	10.315	12.550	15.268
7.	2 Mail	.041	.060	.073	.089
7.	3 Telephone	.329	.486	.592	.720
8.	Finance	4.141	5.730	6.740	7.928
9.	Services	9.249	13.691	16.658	20.267
	Subtotal	50.930	78.310	97.368	121.285
10.	Family consum.	33.193	60.224	86.649	122.368
	Total	84.123	138.534	184.017	243.653

At constant prices of 1970

Table A-4-3 Input-output table (1/2)

Unit: Million pesos

in 1963

Item	1	2	3	4	5	6	7	8	9	10	15
1	37,678	0	209,273	0	0	116	299	13	24	12	247,416
2	125	343	38,614	3,052	1,298	9	338	15	27	26	43,447
3	33,654	8,628	415,809	12,491	45,821	20,649	68,016	3,057	5,350	14,431	627,904
4	0	384	12,884	5,148	88	8,399	2,237	101	176	10,809	40,225
5	0	0	0	0	0	0	0	0	0	0	0
6	51,083	268	202,889	80	0	7,761	3,838	173	302	3,839	270,132
7	31,803	3,515	118,852	784	236	10,381	957	43	75	5,289	163,035
8	1,429	158	5,342	35	11	467	43	2	3	238	7,327
9	2,501	276	9,348	62	19	817	75	3	6	416	12,823
10	7,488	351	29,803	742	6,956	24,756	14,781	664	1,163	1,568	88,271
15	165,761	13,923	1,032,312	22,394	54,428	73,354	90,585	4,071	7,125	36,628	1,500,581
20	2,070	0	77,984	185	12,938	2,343	27,198	1,222	2,139	15,304	141,383
30	167,831	13,923	1,110,296	22,579	67,365	75,697	117,783	5,294	9,264	51,932	1,641,963
40	291,588	32,412	621,019	36,442	67,535	315,656	114,209	5,133	8,983	235,592	1,728,568
41	60,301	8,993	173,149	17,194	48,931	72,030	71,819	3,228	5,649	63,970	525,263
42	231,287	23,419	447,870	19,248	18,604	243,626	42,390	1,905	3,334	171,622	1,203,305
50	459,418	46,335	1,731,315	59,020	134,900	391,353	231,992	10,427	18,247	287,524	3,370,531

Item	43	44	45	46	47	48	50
1	135,175	1,246	16,056	-8,294	67,819	212,002	459,418
2	2,805	374	0	-1,029	738	2,888	46,335
3	855,266	21,494	115,364	-7,985	119,272	1,103,411	1,731,315
4	17,414	1,090	0		292	18,796	59,020
5	0	0	134,900	0	0	134,900	134,900
6	38,214	0	0	0	83,108	121,221	391,353
7	51,323	2,939	0	0	14,696	68,957	231,992
8	2,307	132	0	0	660	3,099	10,427
9	4,037	231	0	0	1,156	5,424	18,247
10	196,838	533	0	0	1,882	199,253	287,524
15	1,303,277	28,039	266,320	-17,308	289,622	1,869,950	3,370,531
20	18,720	3,112	63,467	21,361	0	106,659	248,042
30	1,321,997	31,150	329,787	4,054	289,622	1,976,609	3,618,571
40	0	143,679	0	0	0	143,679	1,872,247
41		143,679	0	0	0	143,679	668,942
42	0	0	0	0	0	0	1,203,305
50	1,321,997	174,829	329,787	4,054	289,622	2,120,288	5,490,819

For item numbers, refer to the attached note.

Table A-4-3 Input-output table (2/2)

Item	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
A1	3,852,625	260	42,611,470	0	247,367	154,807	16,494	0	0	0
A2	2	204,987	5,076,774	184,753	0	0	6,835	0	0	0
A3	7,054,700	365,028	84,314,380	1,595,610	18,295,359	6,338,498	13,999,508	128,914	252,489	2,900,617
A4	34,665	55,203	3,270,146	771,792	132,174	1,076,222	321,614	12,786	25,043	984,359
A5	0	0	0	0	0	0	0	0	0	0
A6	11,589,817	36,045	36,496,946	12,547	0	1,174,697	406,434	9,266	18,149	104,871
A7	3,700,098	1,269,617	19,515,283	221,140	483,038	3,876,198	1,347,377	37,119	72,701	317,903
A8	43,191	6,699	255,058	9,825	22,337	78,631	69,386	2,072	4,058	91,743
A9	84,593	13,122	499,552	19,242	43,750	154,005	135,897	4,058	7,948	179,687
A10	140,552	146,383	5,043,864	117,251	598,820	1,590,730	2,020,895	16,828	32,958	9,448,992
A11	32,791	52,729	409,825	26,934	0	143,831	383,477	289	565	190,167
A58	26,533,034	2,149,073	197,493,298	2,959,094	19,822,845	14,587,619	18,707,917	211,332	413,911	14,218,339
A59	456,174	17,652	19,540,230	394,924	817,977	426,948	1,650,102	6,943	13,597	167,314
A60	26,989,208	2,166,725	217,033,428	3,354,018	20,640,822	15,014,567	20,358,019	218,275	427,508	14,385,653
A70	51,982,219	3,495,824	90,691,928	7,490,790	18,883,307	48,244,663	29,406,787	958,231	1,876,773	28,212,422
A71	14,731,593	966,099	31,160,395	4,619,135	15,072,592	11,203,329	13,368,802	1,095,885	2,146,378	7,715,385
A72	37,249,626	2,529,725	59,531,533	2,871,655	3,810,715	37,041,334	16,037,985	-137,654	-269,605	20,497,037
A80	78,971,427	5,662,549	307,725,456	10,844,808	39,524,129	63,259,230	49,764,806	1,176,506	2,304,281	42,598,075

Item	A11	A58	A61	A62	A63	A64	A65	A66	A67	A80
A1	819	46,883,842	19,945,769	161,207	20,106,976		3,514,901	8,465,708	32,087,585	78,971,427
A2	0	5,473,351	8,158	0	8,158	0	157,862	23,178	189,198	5,662,549
A3	1,697,972	136,943,075	117,470,684	4,627,827	122,098,511	24,402,927	3,714,915	20,566,028	170,782,381	307,725,456
A4	232,567	6,916,571	3,502,146	426,091	3,928,237	0		0	3,928,237	10,844,808
A5	0	0	0	0	0	39,524,129	0	0	39,524,129	39,524,129
A6	10,965	49,859,737	3,838,478	266,126	4,104,604	0		9,294,889	13,399,493	63,259,230
A7	152,367	30,991,841	14,089,165	654,281	14,743,446	0		4,029,519	18,772,965	49,764,806
A8	29,232	612,233	454,917	59,028	513,945	0	0	50,328	564,273	1,176,506
A9	57,254	1,199,107	890,991	115,611	1,006,602	0	0	98,572	1,105,174	2,304,281
A10	428,905	19,586,178	21,589,178	773,301	22,362,479	0	0	649,418	23,011,897	42,598,075
A11	536,867	1,777,475	15,058,253	298,663	15,356,916	0	0	205,010	15,561,926	17,339,401
A58	3,146,948	300,243,410	196,847,739	7,382,135	204,229,874	63,927,056	7,387,678	43,382,650	318,927,258	619,170,668
A59	102,059	23,593,920	4,515,288	686,865	5,202,153	4,836,215	619,541	986,224	11,644,133	35,238,053
A60	3,249,007	323,837,330	201,363,027	8,069,000	209,432,027	68,763,271	8,007,219	44,368,874	330,571,391	654,408,721
A70	14,090,394	295,333,338	0	35,136,400	35,136,400	0	0	0	35,136,400	330,469,738
A71	9,009,000	111,089,593	0	35,136,400	35,136,400	0	0	0	35,136,400	146,225,993
A72	5,081,394	184,243,745	0	0	0	0	0	0	0	184,243,745
A80	17,339,401	619,170,668	201,363,027	43,205,400	244,568,427	68,763,271	8,007,219	44,368,874	365,707,791	984,878,459

For item numbers, refer to the attached note.

Table A-4-4 Input coefficient table

in 1963

Item	1	2	3	4	5	6	7	8	9	10	15
1	.0820115	0	.1208754	.0000051	0	.0002972	.0012902	.0012902	.0012902	.0000421	.0734057
2	.0002730	.0074091	.0223031	.0517109	.0096227	.0000222	.0014582	.0014582	.0014582	.0000911	.0128804
3	.0732526	.1861987	.2401696	.2116387	.3396672	.0527626	.2931803	.2931803	.2931803	.0501910	.1862224
4	0	.0082832	.0074415	.0872224	.0006531	.0214609	.0096434	.0096434	.0096434	.0375931	.0119343
5	0	0	0	0	0	0	0	0	0	0	0
6	.1111897	.0057818	.1171875	.0013605	0	.0198312	.0165453	.0165453	.0165453	.0133533	.0801453
7	.0692252	.0758523	.0686482	.0132790	.0017464	.0265270	.0041262	.0041262	.0041262	.0183960	.0483708
8	.0031112	.0034091	.0030853	.0005968	.0000785	.0011922	.0001854	.0001854	.0001854	.0008268	.0021740
9	.0054447	.0059659	.0053993	.0010444	.0001374	.0020864	.0003245	.0003245	.0003245	.0014469	.0038044
10	.0162978	.0075796	.0172142	.0125668	.0515604	.0632135	.0637135	.0637135	.0637135	.0054517	.0261889
15	.3608057	.3004798	.5952591	.3794247	.4034655	.1874371	.3904671	.3904671	.3904671	.1273920	.4452060
20	.0045057	0	.0450432	.0031345	.0959044	.0059869	.1172365	.1172365	.1172365	.0532255	.0419467
30	.3653114	.3004798	.6413022	.3825593	.4993699	.1934240	.5077036	.5077036	.5077036	.1806175	.4871527
40	.6346886	.6995202	.3586978	.6174407	.5006301	.8065760	.4922964	.4922964	.4922964	.8193825	.5128473
41	.1312551	.1940870	.1000098	.2913230	.3627205	.1840537	.3095730	.3095730	.3095730	.2224861	.1558397
42	.5034335	.5054333	.2586879	.3261177	.1379096	.6225222	.1827235	.1827235	.1827235	.5968964	.3570076
50	1	1	1	1	1	1	1	1	1	1	1

in 1973

Item	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	All	A58
A1	.0487850	.0000459	.1384724	0	.0062586	.0024472	.0003314	0	0	0	.0000472	.0757204
A2	2.533e-8	.0362005	.0164977	.0170361		0	.0001373	0	0	0	0	.0088398
A3	.0893323	.0644635	.2739922	.1471312	.4628909	.1001988	.2813134	.1095738	.1095738	.0680927	.0979256	.2211718
A4	.0004390	.0097488	.0106268	.0711670	.0033441	.0170129	.0064627	.0108679	.0108679	.0231081	.0134126	.0111707
A5	0	0	0	0	0	0	0	0	0	0	0	0
A6	.1467596	.0063655	.1186023	.0011570	0	.0185696	.0081671	.0078761	.0078761	.0024619	.0006324	.0805266
A7	.0468536	.2240364	.0634178	.0203913	.0122213	.0612748	.0270749	.0315503	.0315503	.0074628	.0087873	.0500538
A8	.0005469	.0011831	.0008288	.0009059	.0005652	.0012430	.0013943	.0017611	.0017611	.0021537	.0016859	.0009888
A9	.0010712	.0023172	.0016234	.0017743	.0011069	.0024345	.0027308	.0034492	.0034492	.0042182	.0033019	.0019366
A10	.0017798	.0258511	.0163908	.0108117	.0151507	.0251462	.0406089	.0143031	.0143031	.2218173	.0247359	.0316329
A11	.0004152	.0093119	.0013318	.0024836	0	.0022737	.0077058	.0002453	.0002453	.0044642	.0309623	.0028707
A58	.3359827	.3795240	.6417841	.2728581	.5015378	.2306006	.3759267	.1796269	.1796269	.3337789	.1814912	.4849122
A59	.0057764	.0031173	.0634989	.0364160	.0206956	.0067492	.0331580	.0059010	.0059010	.0039277	.0058860	.0381057
A60	.3417592	.3826413	.7052827	.3092741	.5222334	.2373498	.4090847	.1855279	.1855279	.3377066	.1873771	.5230179
A70	.6582408	.6173587	.2947170	.6907259	.4777666	.7626502	.5909153	.8144721	.8144721	.6622934	.8126229	.4769821
A71	.1865433	.1706120	.1012604	.4259305	.3813517	.1771019	.2686397	.9314741	.9314741	.1811205	.5195681	.1794168
A72	.4716849	.4467467	.1934566	.2647954	.0964149	.5855483	.3222756	-.117002	-.117002	.4811728	.2930548	.2975654
A80	1	1	1	1	1	1	1	1	1	1	1	1

For item numbers; refer to the attached note.

Note

1, A1: Agriculture, forestry and fishing

2, A2: Mining and quarrying

3, A3: Manufacturing

4, A4: Electricity, gas and water

5, A5: Construction

6, A6: Commerce, restaurants and hotels

7, A7: Transport

8, A8: Mail and telegraph

9, A9: Telephone

10, A10: Finance and insurance

10, A11: Services

15, A58: Subtotal

20, A59: Imports

30, A60: Subtotal and import

40, A70: Gross aggregated value

41, A71: Wages and salaries of employees

42, A72: Remuneration of retained earnings

43, A61: Private consumption

44, A62: Government consumption

A63: Subtotal of final consumption

45, A64: Gross fixed investment

46, A65: Variations of existence and statistic discrepancy

47, A66: Exports

48, A67: Subtotal of final demand

50, A80: Gross domestic products value

Table A - 4 - 5 Numerical values used for the telephone income estimation

Item	GDP 1985	GDP growth rate (%)	Percentage of agregated value				Input coefficients (%)			
			1985	1995	2000	2005	1985	1995	2000	2005
1. Agriculture	1,487.6	3.1	60	60	60	60	.131	.131	.131	.131
2. Mining	262.0	5.0	55	55	55	55	.257	.257	.257	.257
3. Manufacturing	2,308.7	5.3	29	29	29	29	.210	.210	.210	.210
4. Electricity	423.4	5.0	60	60	60	60	.137	.137	.137	.137
5. Construction	378.9	6.0	35	35	35	35	.204	.204	.204	.204
6. Commerce	1,215.9	3.3	70	70	70	70	.336	.336	.336	.336
7. Transport & tel.	1,077.2	4.0	60	60	60	60	.350	.350	.350	.350
7.1 Transport*	962.5	4.0	50	50	50	50	.362	.362	.362	.362
7.2 Mail*	24.3	4.0	80	80	80	80	.134	.134	.134	.134
7.3 Telephone*	90.4	4.0	85	85	85	85	.309	.309	.309	.309
8. Finance	723.4	3.3	80	80	80	80	.458	.458	.458	.458
9. Services	1,606.6	4.0	70	70	70	70	.403	.403	.403	.403
Subtotal	10,560.9		46	46	46	46	.236	.236	.236	.236
10. Family consum.	-	4.0	(70)	(70)	(70)	(70)	.500	.600	.700	.800

Note ( ): Ratio between private consumption and GDP.

* : Detail of the "Transport & tel." division.

Table A – 4 – 6 GDP

Unit: Thousands pesos at 1970 constant prices

Item	1985	1995	2000	2005
1. Agriculture	1,487.6	2,018.7	2,351.6	2,739.4
2. Mining	262.0	426.8	544.7	695.2
3. Manufacturing	2,308.7	3,869.5	5,009.5	6,485.4
4. Electricity	423.4	689.7	880.2	1,123.4
5. Construction	378.9	678.6	908.1	1,215.2
6. Commerce	1,215.9	1,682.3	1,978.8	2,327.6
7. Transport & tel.	1,077.2	1,594.5	1,940.0	2,360.3
7.1 Transport*	962.5	1,424.7	1,733.4	2,108.9
7.2 Mail & telegram*	24.3	36.0	43.8	53.3
7.3 Telephone*	90.4	133.8	162.8	198.0
8. Finance	723.4	1,000.9	1,177.3	1,384.8
9. Services	1,606.6	2,378.2	2,893.4	3,520.3
Total	10,560.9	14,339.0	17,683.5	21,851.5

Note *: Detail of the "Transport & tel." division.

3. Various economic and population data

The data used for the telephone demand estimation are shown as follows. Table A—4—7 shows Geographic Gross Domestic Products at constant prices, Table A—4—8 Population, Table A—4—9 Establishment and employment of industry, Table A—4—10 Establishment and employment of commerce and services, Tables A—4—11 and A—4—12 Estimation of population of Argentina and the province of Mendoza by department, Table A—4—13 Rural and urban population by departments, Tables A—4—14 and A—4—15 Establishment and employment of industry, commerce and service in the province of Mendoza.

Table A – 4 – 7 Geographic gross domestic products at constant prices

Thousand Pesos (Law, 1970)

Year = 1980

Province	Div. 1	Div. 2	Div. 3	Div. 4	Div. 5	Div. 6	Div. 7	Div. 8	Div. 9	Total
Cap. Fed.	0.0	0.0	7,155,900.0	997,200.0	1,294,500.0	7,936,900.0	2,358,600.0	4,021,600.0	3,589,580.9	27,354,261.0
Buenos Aires	2,782,500.0	131,901.6	14,663,859.0	1,197,600.0	1,673,100.0	3,943,000.0	2,161,200.0	2,039,217.4	3,078,300.0	31,670,678.0
Catamarca	76,640.0	6,706.0	70,636.0	23,324.0	57,206.0	34,153.0	14,973.0	17,584.0	142,292.0	443,516.0
Cordoba	1,395,838.0	85,005.0	1,724,342.0	163,549.0	396,236.0	1,236,144.0	383,443.0	1,168,896.0	954,126.0	7,512,579.0
Corrientes	341,045.0	18,200.0	308,580.0	23,838.0	140,700.0	146,400.0	73,849.0	116,200.0	236,838.9	1,405,650.9
Chaco	308,345.0	3,430.0	128,840.0	23,856.0	176,242.0	218,779.0	72,744.0	106,062.0	214,194.0	1,254,492.0
Chubut	62,400.0	196,938.0	205,540.0	191,270.0	170,000.0	316,900.0	181,750.0	79,800.0	220,600.0	1,655,198.0
Entre Rios	556,439.0	29,766.0	330,607.0	294,061.0	263,656.0	415,681.0	174,101.0	213,578.0	325,792.0	2,623,681.0
Formosa	89,839.0	1,058.0	37,572.0	11,265.0	55,020.0	41,410.0	27,067.0	20,712.0	72,339.0	356,832.0
Jujuy	230,330.0	59,885.0	199,878.0	21,122.0	142,458.0	153,659.0	42,339.0	47,176.0	455,809.0	1,352,656.0
La Pampa	402,449.0	39,277.0	31,565.2	5,135.0	129,532.0	71,943.0	22,792.0	63,682.4	44,459.0	815,834.6
La Rioja	61,121.0	10,342.0	21,356.0	6,137.0	24,002.0	26,907.0	20,780.0	12,776.0	102,850.0	286,171.6
Mendoza	403,731.0	321,531.0	1,287,292.0	118,843.0	285,970.0	454,968.0	213,967.0	569,707.0	663,782.0	4,319,791.0
Misiones	203,874.0	1,332.0	163,756.0	26,771.0	195,097.0	103,170.0	111,435.0	60,889.0	374,497.0	1,240,821.0
Neuquen	60,703.0	364,071.0	79,943.0	243,675.0	149,629.0	445,645.0	54,895.0	145,198.0	158,020.0	1,691,884.0
Rio Negro	244,581.0	153,626.0	187,001.0	165,552.0	106,805.0	198,977.0	49,534.0	63,421.0	178,009.0	1,297,506.0
Salta	296,029.4	42,586.4	140,892.5	30,912.7	161,486.1	326,000.0	32,211.0	60,217.3	304,258.7	1,444,394.1
San Juan	222,100.0	54,606.0	113,752.0	14,240.0	80,249.0	121,740.0	32,100.0	75,667.4	271,316.0	985,770.4
San Luis	181,999.0	22,064.0	104,254.0	3,096.4	32,073.0	73,086.0	27,476.0	78,673.0	101,021.0	623,742.4
Santa Cruz	70,450.0	167,085.0	13,206.0	117,150.0	148,600.0	80,850.0	29,900.0	30,050.0	170,130.0	827,421.0
Santa Fe	1,785,000.0	4,000.0	2,987,000.0	189,000.0	387,000.0	1,703,000.0	1,108,000.0	622,000.0	732,000.0	9,518,000.0
S. del Est.	238,680.0	9,413.0	30,414.0	17,423.0	208,112.0	106,668.0	71,494.0	65,707.0	265,900.0	1,033,811.0
Tucuman	392,140.0	6,187.0	846,048.0	74,680.5	181,623.7	397,445.8	211,371.6	410,869.0	438,198.0	2,887,559.2
T. del Fuego	10,320.0	62,077.0	14,560.0	1,160.0	21,300.0	22,300.0	18,100.0	6,499.1	14,600.0	170,916.1
Total G. Div	10,417,554.0	1,791,089.0	30,853,594.0	3,965,861.2	6,432,596.8	18,557,726.0	7,544,121.6	10,101,182.0	13,109,462.0	102,733,186.0

Note: Div. 1: Agriculture

Div. 2: Mining

Div. 3: Manufacturing

Div. 4: Electricity, Gas and Water

Div. 5: Construction

Div. 6: Commerce, Restrants & Hotels

Div. 7: Transport and Communications

Div. 8: Banking

Div. 9: Government and Other Services

Table A-4-8　Population

Province	Population			Index	Area km²	Inhab-itants per km²	Population		% Population	
	Total	Men	Women				Urban	Rural	Urban	Rural
Total of the nation	27,947,446	13,755,983	14,191,463	96.9	2,780,091.5	10.1	23,192,892	4,754,554	83.0	17.0
Capital Federal	2,922,829	1,327,409	1,595,420	83.2	199.5	(2)	2,922,829		100.0	
Buenos Aires	10,865,408	5,382,182	5,483,226	98.2	307,571.0	35.3	10,122,513	742,895	93.2	6.8
Catamarca	207,717	102,668	105,049	97.7	100,967.0	2.1	119,513	88,204	57.5	42.5
Cordoba	2,407,754	1,184,813	1,222,941	96.9	168,766.0	14.3	1,943,557	464,197	80.7	19.3
Corrientes	661,454	327,744	333,710	98.2	88,199.0	7.5	425,880	235,574	64.4	35.6
Chaco	701,392	355,593	345,799	102.8	99,633.0	7.0	426,844	274,548	60.9	39.1
Chubut	263,116	136,608	126,508	108.0	224,686.0	1.2	214,049	49,067	81.4	18.6
Entre Rios	908,313	449,894	458,419	98.1	78,781.0	11.5	625,304	283,009	68.8	31.2
Formosa	295,887	149,782	146,105	102.5	72,066.0	4.1	164,703	131,184	55.7	44.3
Jujuy	410,008	205,348	204,660	100.3	53,219.0	7.7	301,943	108,065	73.6	26.4
La Pampa	208,260	107,277	100,983	106.2	143,440.0	1.5	135,110	73,150	64.9	35.1
La Rioja	164,217	81,495	82,722	98.5	89,680.0	1.8	101,247	62,970	61.7	38.3
Mendoza	1,196,228	586,805	609,423	96.3	148,827.0	8.0	824,430	371,798	68.9	31.1
Misiones	588,977	298,528	290,449	102.8	29,801.0	19.8	297,095	291,882	50.4	49.6
Neuquen	243,850	126,048	117,802	107.0	94,078.0	2.6	185,608	58,242	76.1	23.9
Rio Negro	383,354	195,532	187,822	104.1	203,013.0	1.9	275,373	107,981	71.8	28.2
Salta	662,870	329,847	333,023	99.0	154,775.0	4.3	476,153	186,717	71.8	28.2
San Juan	465,976	227,514	238,462	95.4	89,651.0	5.2	335,376	130,600	72.0	28.0
San Luis	214,416	108,258	106,158	102.0	76,748.0	2.8	150,170	64,246	70.0	30.0
Santa Cruz	114,941	64,439	50,502	127.6	243,943.0	0.5	99,776	15,165	86.8	13.2
Santa Fe	2,465,546	1,213,739	1,251,807	97.0	133,007.0	18.5	2,022,790	442,756	82.0	18.0
Santiago del Estero	594,920	296,326	298,594	99.2	135,254.0	4.4	308,945	285,975	51.9	48.1
Tucuman	972,655	481,536	491,119	98.0	22,524.0	43.2	689,444	283,211	70.9	29.1
Tierra del Fuego	27,358	16,598	10,760	154.3	21,263.0	1.3	24,240	3,118	88.6	11.4

Source: Censo Nacional de Población y Vivienda 1980

Table A – 4 – 9 Establishment and employment of industry
(Total of the nation)

Jurisdiction	1974		1985	
	No. of establishment	No. of employment	No. of establishment	No. of employment
Total	126,388	1,525,221	111,767	1,359,519
Capital Federal	23,838	338,683	16,099	228,854
Buenos Aires	46,600	680,718	41,391	597,044
19 Partidos del Gran Bs. As.	30,033	499,552	28,615	424,109
Demas Partidos	16,567	181,166	12,776	172,935
Catamarca	522	2,052	451	4,100
Cordoba	13,441	123,249	10,967	100,182
Corrientes	1,333	9,580	1,299	10,931
Chaco	2,141	15,737	2,429	19,691
Chubut	630	10,329	623	13,844
Entre Rios	3,151	23,673	3,387	26,186
Formosa	758	4,116	923	5,136
Jujuy	707	15,120	791	17,744
La Pampa	1,185	4,388	842	5,408
La Rioja	403	1,848	503	5,999
Mendoza	5,330	44,721	5,163	58,181
Misiones	2,688	16,273	4,158	30,539
Neuquen	390	2,693	539	5,401
Rio Negro	1,100	9,133	1,156	10,938
Salta	1,436	12,992	1,288	12,707
San Juan	1,027	8,451	1,523	11,855
San Luis	888	4,680	700	10,116
Santa Cruz	198	1,481	180	1,379
Santa Fe	15,103	145,596	13,667	136,483
Santiago del Estero	1,152	6,836	1,234	7,487
Tierra del Fuego	60	581	154	6,279
Tucumán	2,307	42,291	2,300	33,035

Source: P11, Censo Nacional Economico 1985

Table A – 4 – 10   Establishment and employment of commerce and services (Total of the nation)

Jurisdiction	1974		1985	
	No. of establishment	No. of employment	No. of establishment	No. of employment
Total	696,910	1,845,488	787,279	2,183,157
Capital Federal	113,284	498,442	111,029	523,838
Buenos Aires	255,290	541,570	282,267	683,463
19 Partidos del Gran Bs. As.	139,507	283,627	158,107	377,473
Demas Partidos	115,783	257,943	124,160	305,990
Catamarca	3,940	8,393	4,623	9,013
Cordoba	66,708	166,201	78,979	201,657
Corrientes	13,328	28,682	16,009	34,979
Chaco	11,001	27,953	15,277	33,693
Chubut	5,446	15,300	7,557	22,505
Entre Rios	23,724	52,413	25,899	54,819
Formosa	4,809	11,040	6,511	11,805
Jujuy	7,546	15,700	10,730	24,419
La Pampa	6,845	14,606	8,388	18,632
La Rioja	3,510	7,043	4,091	8,399
Mendoza	27,264	68,349	33,431	88,827
Misiones	9,117	21,584	12,531	32,189
Neuquen	4,200	11,532	6,379	19,537
Rio Negro	8,446	23,768	11,047	35,597
Salta	12,295	30,330	13,751	35,384
San Juan	8,582	21,047	10,380	24,389
San Luis	5,509	11,835	5,674	12,815
Santa Cruz	2,321	6,070	3,113	8,466
Santa Fe	73,736	183,558	84,914	220,392
Santiago del Estero	12,443	34,523	13,553	23,300
Tierra del Fuego	449	1,388	967	3,086
Tucuman	17,117	44,161	20,179	51,953

Source: P45, Censo Nacional Economico 1985

Table A-4-11 Estimation of population of the nation and the province of Mendoza

Item	Argentina			Mendoza Total
	Total	Urban	Rural	
1970	23,962,313	18,797,173	5,165,141	
1975	26,051,685	21,033,802	5,017,883	
1980	28,237,149	23,435,154	4,801,995	1,189,595
1985	30,563,833	25,874,899	4,688,936	1,301,639
1990	32,879,877	28,224,887	4,654,991	1,417,784
1995	35,072,698	30,554,419	4,518,278	1,526,365
2000	37,196,714	32,740,518	4,456,196	1,632,240
2005	39,348,500	34,948,936	4,399,561	
2010	41,507,493	37,088,690	4,418,799	
2015	43,593,877	39,159,514	4,434,360	
2020	45,564,691	41,079,084	4,485,610	
2025	47,420,931	42,887,057	4,533,874	
Note	*1	*1	*1	*2

*1: Proyecciones de la Poblacion 1970-2025

*2: Poblacion segun proyeccion (hip. media)

Table A-4-12 Population by the departments

Departments (Gran Mendoza)	1985	1990	1995	2000
Capital	125,554	133,619	140,695	147,533
Godoy Cruz	151,488	163,247	174,896	187,373
Guaymallen	199,113	216,678	234,446	253,495
Las Heras	130,986	143,114	155,970	170,693
Lujan de Cuyo	67,806	74,235	81,107	88,765
Maipu	106,012	116,321	125,635	137,520
Total	780,959	847,214	912,749	985,379

Source: DEIE

Table A-4-13 Population: Rural and Urban by departments, Mendoza (1/2)

Departments	1947			1960		
	Rural	Urban	Total	Rural	Urban	Total
Mendoza	291,656	296,575	588,231	269,615	527,421	824,036
Capital	–	97,496	97,496	–	109,122	109,122
Gral. Alvear	19,801	5,952	25,753	15,166	20,048	35,214
Godoy Cruz	–	54,480	54,480	5,564	80,024	85,588
Guaymallen	22,164	44,894	67,058	17,180	92,673	109,853
Junin	17,189	–	17,189	17,028	3,899	20,927
La Paz	5,536	–	5,536	3,436	2,502	5,938
Las Heras	18,369	14,933	33,302	19,843	44,124	63,967
Lavalle	12,431	–	12,431	13,249	4,007	17,256
Lujan de Cuyo	20,765	7,042	27,807	23,635	14,949	38,584
Maipu	30,094	14,076	44,170	31,682	27,079	58,761
Malargue	–	–	–	4,785	4,523	9,308
Rivadavia	18,879	5,643	24,522	19,954	14,358	34,312
San Carlos	14,346	–	14,346	10,784	7,556	18,340
San Martin	22,048	13,967	36,015	24,766	32,111	56,877
San Rafael	61,398	35,655	97,053	61,294	56,949	118,243
Santa Rosa	7,593	–	7,593	9,653	–	9,653
Tunuyan	13,393	2,437	15,830	12,457	9,781	22,238
Tupungato	7,650	–	7,650	6,139	3,716	9,855

Source: Censo Nacional de Población y Vivienda, 1980, Mendoza

Table A – 4 – 13 Population: Rural and Urban by departments, Mendoza (2/2)

Departments	1970			1980		
	Rural	Urban	Total	Rural	Urban	Total
Mendoza	332,154	640,921	973,075	350,353	844,038	1,194,391
Capital	–	118,568	118,568	–	118,706	118,706
Gral. Alvear	19,206	20,000	39,206	14,725	27,200	41,925
Godoy Cruz	–	112,481	112,481	3,907	138,236	142,143
Guaymallen	19,484	118,995	138,479	23,405	157,616	181,021
Junin	16,281	5,771	22,052	17,581	7,786	25,367
La Paz	2,868	3,533	6,401	2,722	4,604	5,326
Las Heras	13,834	70,655	84,489	18,087	102,341	120,428
Lavalle	15,387	2,091	17,478	20,525	3,738	24,263
Lujan de Cuyo	21,936	25,138	47,074	25,506	36,589	62,095
Maipu	36,760	34,839	71,599	33,331	63,836	97,167
Malargue	5,965	5,462	11,427	7,651	8,926	16,577
Rivadavia	24,297	13,072	37,369	27,953	14,906	42,859
San Carlos	17,064	2,678	19,742	14,780	6,449	21,229
San Martin	35,300	30,506	65,806	49,795	37,796	87,591
San Rafael	67,869	63,370	131,239	53,329	91,621	144,950
Santa Rosa	10,727	–	10,727	10,586	4,116	14,702
Tunuyan	13,965	10,813	24,778	13,216	16,151	29,367
Tupungato	11,211	2,949	14,160	13,254	3,421	16,675

Source: Censo Nacional de Población y Vivienda, 1980, Mendoza

Table A – 4 – 14 Establishment and employment of industry
(The province of Mendoza)

Department	1974		1985	
	No. of establishment	No. of employment	No. of establishment	No. of employment
Total	5,330	44,721	5,163	58,181
Capital	542	4,347	369	2,684
General Alvear	248	1,680	229	2,365
Godoy Cruz	575	5,642	514	7,618
Guaymallen	969	6,716	942	8,276
Junin	160	641	170	1,315
La Paz	20	51	15	37
Las Heras	336	3,171	399	2,864
Lavalle	35	174	57	663
Lujan de Cuyo	203	3,592	209	2,405
Maipu	419	5,770	449	7,588
Malargue	19	185	29	363
Rivadavia	240	1,536	222	1,126
San Carlos	86	405	85	396
San Martin	467	3,100	465	5,201
San Rafael	778	6,703	775	12,018
Santa Rosa	70	251	76	904
Tunuyan	110	619	114	1,935
Tupungato	53	138	44	423

Source: P30, Censo Nacional Economico 1985

Table A – 4 – 15 Establishment and employment of commerce and services
(The province of Mendoza)

Department	1974		1985	
	No. of establishment	No. of employment	No. of establishment	No. of employment
Total	27,264	68,349	33,431	88,827
Capital	5,511	23,418	6,030	23,936
General Alvear	1,186	2,438	1,295	2,279
Godoy Cruz	3,034	6,761	3,612	11,981
Guaymallen	3,917	8,303	5,207	11,845
Junin	529	1,075	648	1,218
La Paz	147	241	205	310
Las Heras	1,849	3,158	2,422	4,213
Lavalle	217	499	362	672
Lujan de Cuyo	921	1,945	1,264	2,961
Maipu	1,660	3,052	2,277	7,672
Malargue	267	495	443	1,153
Rivadavia	956	1,732	1,154	1,769
San Carlos	479	969	465	900
San Martin	1,989	4,223	2,531	5,348
San Rafael	3,436	7,552	4,125	8,910
Santa Rosa	209	360	276	449
Tunuyan	670	1,638	807	2,557
Tupungato	233	490	308	654

Source: P64, Censo Nacional Economico 1985