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## Relatively Low Activities of the Hokkaido Economy and Regional Development Strategies

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### Abstract

This paper presents some factors in the relatively low activity of the Hokkaido economy and regional development policies to improve these factors, especially using the strategies for adding higher value to products of primary industry.

The factors in the relatively low level of economic activity in Hokkaido are based on (1) insufficiently competitive conditions of Hokkaido primary industry in the world market, (2) small proportion of high tech industries in the manufacturing industry in Hokkaido and (3) low labor productivity and high distribution costs in tertiary industry. Moreover, central government subsidies have given only little inducement to encourage the competitive and creative powers of the enterprises in Hokkaido.

Concrete development strategies from product market aspect are to invite high tech industries from other prefectures. Invitation of such industries is more advantageous if they include related enterprises and subcontractors. At the same time, it is much more important to add high value to agricultural, forest and marine products. On the other hand, major strategy from factor market aspect is to educate and settle enterprising businessmen and technical experts.

**Key Words:** Developing Area in Japan, Deficit in Balance of Payment, High Proportion of Government Investment.

### 1. Object of the Analysis

International trade friction and fiscal rigidity in the Japanese economy have and are leading to decreases in financial assistance to Hokkaido. At present the level of economic activity in Hokkaido is relatively low compared with the national average, despite much financial assistance.

This report aims to explain some factors in the relatively low activity of the Hokkaido economy and regional development strategy, to improve these factors, especially a strategy for adding higher value to products of primary industry.

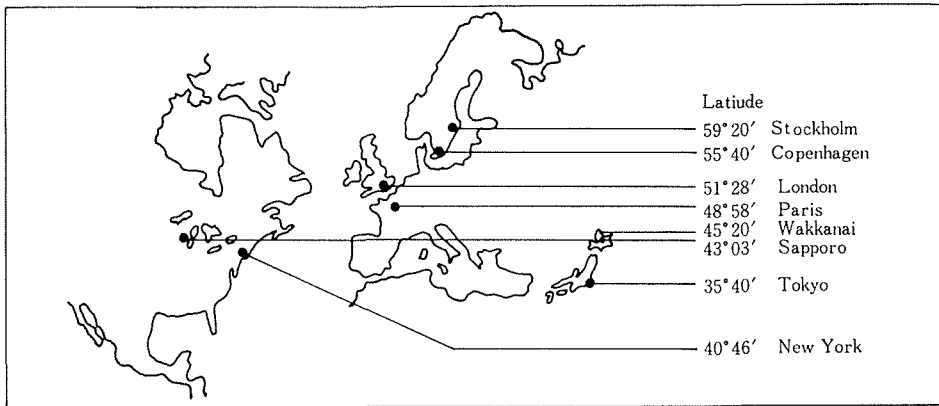
Factors in the relatively low level of activity of the Hokkaido economy were analyzed with considerations of the industrial structure, public finance, and social conditions. However, the financial and social factors, included in the tentative theory, have not been verified. For a regional development strategy it is proposed that technological innovation must be adopted in the Hokkaido economy, based on

the success this strategy has had in Denmark. This expresses some of the limitations of this paper.

## 2. Outline and Characteristics of the Development in Hokkaido

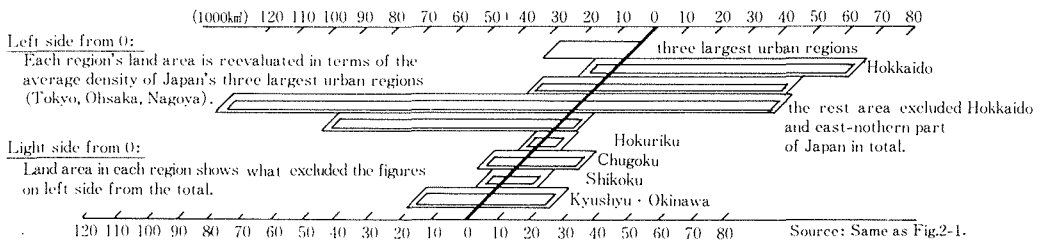
### 1) Outline of Hokkaido

- (1) Location (Fig. 2-1): The latitude of Sapporo is almost the same as Milwaukee in the United States and Marseilles in France.
- (2) Area (Fig. 2-2): The left value shows areas of regions computed by the density of population in the Tokyo, Osaka, and Nagoya areas. The right hand value is the area that remains when removing the converted area from the actual area.
- (3) Change in population (Fig. 2-3): The population of Hokkaido was about 50,000 in 1870s, 3,000,000 in 1930 and 5,700,000 in 1985, 4.7% of the national total.
- (4) Monthly mean air temperatures (Fig. 2-4): The temperature in Sapporo is lower than that in Tokyo, 5°C in summer and 10°C in winter.
- (5) Industrial structure (Table 2-1): It is a characteristic of Hokkaido that primary and tertiary industries are dominating and that the contribution of secondary industry is remarkably smaller than the national average.



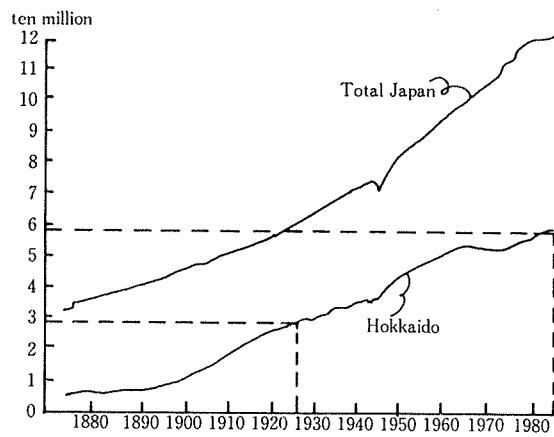
Source: Hokkaido Development Bureau, "Development in Hokkaido" 1983.

Figure 2-1. Location of Hokkaido.



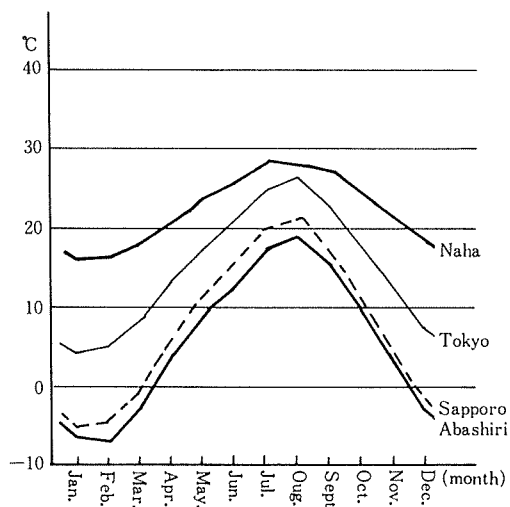
Source: Same as Fig.2-1.

Figure 2-2. Area of Hokkaido Region.



Source: Hokkaido Development Bureau, "Development in Hokkaido" 1986.

Figure 2-3. Long Term Trend of Population.



Source: Same as Fig.2-1.

Figure 2-4. Temperature: Monthly mean.

Population		(1985)
Japan (A)	12,104 thousand	
Hokkaido (B)	5670	
(B/A)	4.7%	

Density		(1985)
Japan (A)	3,3210/km <sup>2</sup>	
Hokkaido (B)	72	
(B/A)	22.4%	

Table 2-1. Net Product in Hokkaido

	1947	1960	1972	1984	1983 Japan
I Primary Industry	36.9	21.8	12.2	8.3	3.2
1) Agriculture	25.6	13.9	7.7	4.9	
2) Forestry	3.3	5.2	1.8	1.2	
3) Fishery	8.0	2.7	2.7	2.2	
II Secondary Industry	29.4	29.0	25.8	22.8	37.2
1) Mining	11.0	7.4	2.1	1.2	0.4
2) Construction	4.3	7.3	10.0	9.4	7.6
3) Manufacturing	14.1	14.3	13.7	12.8	29.2
III Tertiary Industry	33.7	49.2	61.9	68.9	59.6
1) Whole sale & Retail	10.1	16.3	21.1	17.9	11.7
2) Finance, Insurance and Real Estate	3.2	4.8	9.2	14.4	16.1
3) Transportation	} 8.0	} 9.2	5.0	} 6.1	} 10.0
4) Communication			1.1		
5) Electricity, Gas & Water			1.0		
6) Services	9.9	13.1	17.0	21.2	17.2
7) Government	2.5	5.8	6.7	6.2	4.6
Total	100.0	100.0	100.0	100.0	100.0

Hokkaido Prefectural Government, "Statistical yearbook of Income in Hokkaido".

The especially important industries are agriculture, construction, wholesale and retail, and service industries. Manufacturing industry is extremely undeveloped.

- (6) The per capita income in Hokkaido is nearly 5% lower than the national average. The national per capita income ranks fourteenth in the world (1983).

2) *Characteristics of Development in Hokkaido by Period*

- (1) Development in Hokkaido was started by the central government around 1868. Up to 1945 the main projects were land development and national defense by the colonists. Particularly agricultural development and increases in food production were stressed.
- (2) 1947-'51 Agricultural land development and emigration.
- (3) 1952-'56 Emigration and development of resources.
- (4) 1958-'70 Modernization of primary industry, and environmental improvements to develop secondary industry.
- (5) 1971-'87 Modernization of industry and development of infrastructure.

3) *Hokkaido's Development Budget*

- (1) The Hokkaido share of the national development budget (Table 2-2) was

**Table 2-2.** Govt. Expenditures to Public Works

(year)	Hokkaido/Total Japan					
	1952	1957	1963	1971	1978	1985
(%)	13.0	17.2	14.5	12.3	11.0	11.0

Source: Hokkaido Development Bureau, "Budget for Development".

**Table 2-3.** The Structure of Public Works in Hokkaido (unit: %)

Expenditures	year							Japan 1984
	1952	1957	1963	1971	1978	1984		
1. Conservation of Forest and River	25.7	13.6	14.2	15.6	17.1	16.8	13.7	
2. Road Improvement Works	21.9	39.9	48.8	45.0	34.2	31.1	34.6	
3. Harbour Improvement Works	11.2	10.3	10.4	10.6	13.1	11.6	7.3	
A. Harbour	5.6	5.4	7.0	6.7	7.4	6.1	3.7	
B. Fishing Port	5.6	4.4	3.0	3.3	4.9	4.1	1.9	
C. Airport	—	0.5	0.4	0.6	0.8	1.4	1.7	
4. Housing Measures	2.7	4.4	2.5	2.9	3.7	4.3	15.5	
5. Improvement of Life Environment	0.1	0.3	0.6	2.2	5.2	7.3	14.0	
6. Improvement of Agricultural Condition	33.8	29.0	21.8	22.1	24.6	25.4	11.9	
7. Construction of Forest Roads	4.5	2.5	1.7	1.6	2.1	3.4	3.1	
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

Source: Hokkaido Development Bureau, "Statistics on the Development in Hokkaido".

17% in 1957 and decreased to 11% in 1985.

- (2) The ratio of the Hokkaido development budget in the Hokkaido income : In 1983, the ratio of the development budget to the income was 10%. The percentage of subsidies in the budget to the income was 6.9%. Nationally the proportion of expenditures for public works to the national income was 5.7%. The proportion of nationwide expenditures for public works to the national income was 2.6%.
- (3) Structure of Hokkaido's development budget (Table 2-3): In 1984 the ratio of expenditures for road improvements and agricultural land improvements were 57% of the total. When expenditures for soil conservation, flood control and harbor improvements were also included, this ratio reached 85%.
- (4) Marginal productivity of development projects in Hokkaido : The marginal productivities of public works expenditures in Hokkaido and nationally during 1961-'75 are found with a simple production function  $Y=AL^{\alpha}K^{\beta}$  ( $L$ = employed population,  $K$ = public works expenditures). The marginal productivity of  $\alpha K$  in Hokkaido was only 41% of the national rate.

### 3. Actual Condition of Nationally Relatively Low Level of the Hokkaido Economy

- 1) The economic growth rate in Hokkaido is low compared with that of the

Table 3-1. Changes of Economic Growth Rate by Region (%)

Region		Period					
		1955~60	1960~65	1965~70	1970~75	1975~80	1980~83
Total Japan		11.4	15.4	18.0	16.6	10.2	5.0
Big Urban Area	Kanto Bay Area	13.9	17.4	19.1	16.1	10.6	6.2
	Kinki urban	10.6	16.9	18.4	14.6	9.6	4.3
Surrounding Area of Big Urban Area	Kanto Inland	10.5	15.2	18.4	17.5	11.2	5.7
	Tokai	13.6	14.0	19.3	15.9	10.5	5.0
	Kinki Local	9.2	15.0	17.4	17.6	10.2	4.9
	Sanyo	11.4	14.7	18.8	15.8	8.9	4.4
Outer Area of Big Urban Area	South Tohoku	9.2	14.4	16.1	19.1	10.0	4.5
	Hokuriku	11.0	13.0	17.3	17.2	9.7	4.5
	Shikoku	9.1	13.6	17.2	16.5	9.5	3.4
	North Kyushu	9.3	12.7	16.5	18.9	10.1	3.9
Depressed Area	Hokkaido	10.2	13.2	15.0	17.3	10.9	3.0
	North Tohoku	9.8	14.5	15.0	18.8	9.0	4.0
	San-in	7.9	12.0	15.7	18.7	10.0	4.4
	South Kyushyu	7.3	15.1	14.2	20.2	10.9	5.0
	Okinawa	—	—	16.1	26.5	9.6	7.1

Source: Economic Planning Board, "Statistical yearbook of Local Economy".  
Economic Planning Board, "Statistical yearbook of prefectural Income".

**Table 3-2.** Index of Structural Instability of Hokkaido Economy 1983

Positive Factors		Negative Factors	
Total Index	108.6	Total Index	156.9
Degree of Richness	84.0	Rate of Unemployment	98.1
Income Difference	93.5	People Disappeared from Home	144.1
Number of Rooms per capita	112.9	Consumer Price Level	103.9
Social Overhead Capital per capita	167.8	Number of the Firm Bankruped	228.2
—	—	Ratio of the people Supported their Lives by the Govt.	168.8
—	—	Receipt of Shared Taxes for Local Government	198.4

Source: Asahi Newspaper Co., LTD. "Minryoku" 1985.

**Table 3-3.** Relative low Level of Living

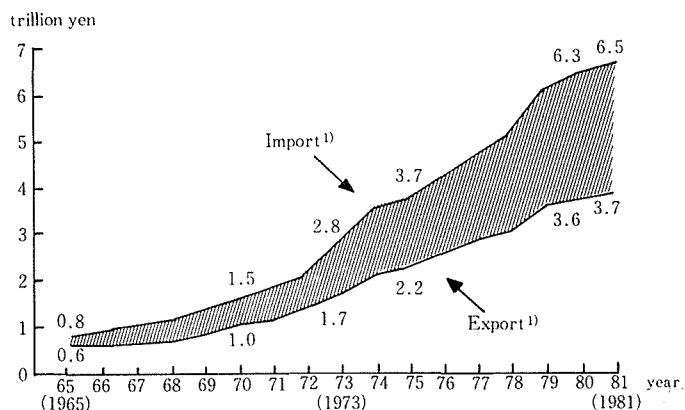
Items		Hokkaido/Total Japan	
		1968 (%)	1983 (%)
Population		5.23	4.74
Personal Income		4.90 (93.7)	4.39 (92.6)
Total Power Index of the Region		4.86 (92.9)	4.46 (94.1)
Private Finance	Bank Deposit	2.59	2.45
	Bank Loan	2.53	2.46
Luxury	Special Class Rice Liquor	1.71	2.04
	Cheap Japanese Liquor	13.89	11.16
	Cheap Japanese Cigarette "Echo"	—	10.72
Consumption	Store's Annual Sales	3.80 (72.7)	3.87 (81.6)
Information	No. of Newspaper	(89.9)	(98.5)
		5.91	4.07
	No. of Mail	(113.0)	(85.9)
		5.45	4.56
	No. of Books & Magazines	(104.2)	(96.2)
Health	No. of Library	3.52	4.23
	No. of Medical Doctors	4.27	4.27 (88.8)
Public	National Taxes	2.71 (51.8)	2.87 (60.5)
Finance	Local Taxes	3.68 (70.4)	6.10 (75.1)
Ownership ratio of Consumer durables		—	(88.6)

Source: Asahi Newspaper Co. LTD "Minryoku" 1985.

The figures in bracket show the index of Hokkaido for 100, the level of total Japan.

nation and it fluctuates with the national fluctuations. Particularly the decreases in the growth rate in Hokkaido are large (Table 3-1).

- 2) The Hokkaido economy is more unstable than the national average because of many bankruptcies, a high consumer price index, and a high proportion of families on welfare (Table 3-2).
- 3) From the per capita income or the relative per capita activity level comprising consumption and cultural factors, the level of living in Hokkaido is lower than the national average (Table 3-3), (Figure 3-1).



Source: Statistical yearbook of Hokkaido Prefectural Income Estimation.

1) Both Concept of Domestic and Oversea Aspect.

Figure 3-1. Annual Changes of Import & Export in Hokkaido.

#### 4. Some Factors in the Relatively Low Level of Economic Activities in Hokkaido

##### 1) Industrial Structure

- (1) Primary industry in Hokkaido is relatively powerful, compared with the rest of Japan, but it is insufficiently competitive in world markets (Table 4-1).
- (2) The manufacturing industry in Hokkaido is mainly light industry (Table 4-2), and the proportion of high tech industries is small (Table 4-3).
- (3) Tertiary industry in Hokkaido has low labor productivity and high distribution costs due to a large number of public workers, and many very small-scale finance, real estate, and commercial enterprises.

##### 2) Public Finances

- (1) Public budgets prepared by politicians and bureaucrats, are generally aimed at people in lower income brackets and producer interest groups, mainly from agriculture and the construction industry (Figure 4-1). Allocations for manufacturing industry is made only as indirect encouragement, and this may have retarded the progress of manufacturing industry.



**Table 4-1.** Labor Productivity, Net Product, Import & Export in Hokkaido (1983)

	Labor Productivity Hokkaido/ Japanese Average	Net Product Hokkaido/ Total Japan	Shipment to Other Prefecture in Total Production	Domestic Import/ Regional Demand	Export/ Total Production	Import/ Total Demand
	%	%	①	%	%	%
Primary Industry	197.2	11.7	34.8	11.4	0.6	11.0
Secondary Industry	92.2	2.8				
Manufacturing Industry	98.5	2.2	(22.0)	(61.0)	( 5.0)	( 2.1)
Tertiary Industry	89.3	5.0				
Wholesale & Retail	97.2	4.4	4.1	4.6	0.3	0.0

Source: Hokkaido Economic White Paper.

Hokkaido Statistical Yearbook of Finance and Economy.

Input-Output Table Analysis of Hokkaido Economy in 1980.

\*The figures in bracket show those of ordinary machinery. ① The Figures in 1983.

**Table 4-2.** Value of Shipment in Light and Heavy Industry (%)

	Light ①			Light ②			Heavy ①			Heavy ②		
	1955	1970	1983	1955	1970	1983	1955	1970	1983	1955	1970	1983
Total Japan	9.5	10.9	12.3	45.8	26.8	23.1	18.0	37.7	40.9	26.7	24.6	23.7
Hokkaido	5.9	7.4	8.6	64.6	63.7	60.9	5.5	12.5	10.9	24.0	16.4	19.6
Kanto Bay Area	15.1	13.5	15.1	30.1	16.0	13.9	27.3	46.8	45.5	27.2	23.0	25.4
Kanto Inland	7.1	5.4	10.6	63.1	26.9	20.7	17.4	45.6	53.4	6.3	16.5	15.2
South Tohoku	6.6	6.6	10.9	51.9	41.7	33.2	11.5	27.4	38.1	29.9	23.1	18.0
North Tohoku	3.7	5.3	8.7	52.7	57.2	49.3	3.9	12.8	27.4	38.3	22.8	14.4

Light ①: Apparel, Furniture and Fixtures, Print and Publication, Leather, Rubber.

Light ②: Food Processing, Textiles, Lumber and Wood Product, Pulp, Paper, Ceramic, Stone and Clay Products.

Heavy ①: Fabricated Metal Product, Ordinary Machinery, Electric Machinery Equipment and Suppliers, Transport Equipment, Precision Instrument, Ordnance and Accessories.

Heavy ②: Chemicals and Allied Products, Petroleum and Coal, Non-Ferrous Metal Product, Product, Iron and Steel.

Source: Ministry of International Trade and Industry. "Industrial Statistics".

(2) The ratio of subsidies covered by public finances is generally large. These subsidies are allocated from the nation to prefectures, from prefecture to municipalities, and from municipalities to various groups. Therefore there is only little inducement to encourage the competitive and creative powers of enterprises in a market economy. As the result there is little income

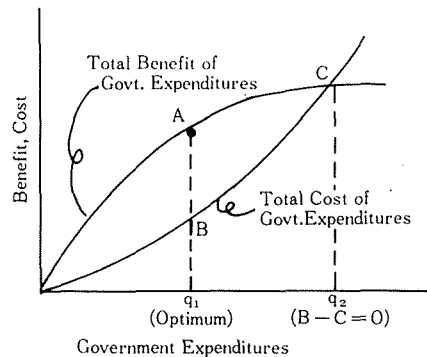
**Table 4-3.** The Share of High Technological Industry in Hokkaido (Billion yen)

	1975	1976	1977	1978	1979	1980	1981	1982	1982/ 1975
Value of Shipment in High Tech. Industry (A)	16	48	47	31	32	48	54	86	5.5
Value of Manufacturing Industry (B)	3646	3987	3978	4035	4449	5082	5128	5141	1.4
(A)/(B) (%)	0.4	1.2	1.2	0.8	0.7	0.9	1.0	1.7	

Source: Hokkaido Takushoku Bank, "Monthly Economic Report,," Aug., 1984.

from private corporations and much compensation of employees in Hokkaido (Table 4-4). The Hokkaido economy has largely been supported by public expenditures for a long time, which may have resulted in poorer inducements for development in Hokkaido than in other prefectures.

- (3) Public finance expenditure for Hokkaido has caused remarkable inducements to production in construction industry, commerce and to domestic import (Table 4-5, 4-6). In this way, financial assistance may have prevented capital accumulation in Hokkaido.



**Figure 4-1.** Benefit & Cost of Govt. Expenditures.

### 3) *Social Conditions*

Hokkaido emigrants were mainly lower-class 'samurais' (warriors) who by the Meiji Restoration could not make a living in their native districts, poor people who came to Hokkaido to work in fishery and mining, and criminals. The extreme natural and economic conditions possibly led to resignation and the resulting unstable social situation. Under these social conditions, constant help from public finances as mentioned above may have prevented the development of free competition in the community, and as a result manufacturing industry may have become retarded.

## 5. Aims of Development in Hokkaido

- 1) *To encourage income growth and employment.....Income growth policy*
- (1) Hokkaido's per capita income can be increased by encouraging the production of high value added products through the industrial structure and by lowering the price of production to establish an independent economy, to move away from public financial expenditures to support import substitu-

Table 4-4. The structure of Income Distribution

		1983 Income Distri- bution ④	(% )											
			1955				1970				1983			
			①	②	③	another	①	②	③	another	①	②	③	another
Total	Japan	2,311	51.3	6.0	37.2	5.5	54.2	14.6	19.7	11.5	68.0	11.5	12.8	7.7
Big Urban Area	Kanto Bay	700	58.6	10.7	24.5	6.2	56.1	17.9	13.2	12.8	68.0	14.2	10.3	7.5
	Kinki Urban	343	58.7	7.0	28.0	6.3	53.1	17.4	16.2	13.3	66.2	11.5	10.3	12.0
Surrounding Area of Big Urban Area	Kanto Inland	164	37.5	3.8	54.7	4.0	51.6	11.8	26.4	10.2	64.7	11.7	16.1	7.5
	Tokai	262	50.4	7.1	36.8	5.7	52.0	17.3	19.1	11.6	68.1	12.3	12.4	7.2
	Kinki Local	59	45.3	3.7	47.1	3.9	52.7	11.3	25.8	10.2	66.8	11.2	13.5	8.5
	Sanyo	116	49.5	4.1	41.7	4.7	55.7	14.5	20.3	9.5	68.2	12.2	11.4	8.2
Outer Area of Big Urban Area	South Tohoku	131	40.6	2.9	50.9	5.6	51.9	9.6	28.1	10.4	69.4	8.8	15.8	6.0
	Hokuriku	55	43.7	4.5	47.4	4.4	52.7	12.8	23.7	10.8	67.7	10.1	14.8	7.4
	Shikoku	67	38.9	4.0	52.3	4.8	49.7	9.6	30.0	10.7	64.9	7.9	18.5	8.7
	North Kyushu	143	55.3	2.2	37.1	5.4	56.5	10.8	23.6	9.1	68.4	10.3	14.4	6.9
Depressed Area	Hokkaido	99	57.0	4.5	33.7	4.8	64.9	8.0	20.8	6.3	80.0	5.3	12.9	1.8
	North Tohoku	62	42.1	2.6	50.9	4.4	50.4	6.3	32.6	10.7	79.6	5.3	20.1	5.0
	San-in	21	43.6	1.9	50.3	4.2	56.1	7.9	25.8	10.2	72.1	7.0	15.4	5.5
	South Kyushu	73	40.2	1.8	53.3	4.7	49.2	6.0	34.6	10.2	66.6	7.8	19.4	6.2
	Okinawa	16	—	—	—	—	50.1	4.6	30.3	15.0	62.8	7.5	28.4	11.3

① Compensation of Employees.

② Income from Private Corporations.

③ Income from Unincorporated Enterprises.

Source: Economic Planning Board, "Income Statistics by Region".

④ 100 billion yen.

Table 4-5. Production Inducement by Each Item in Final Demands

unit: 0.1 Billion yen

	year	Business Consumption Expenditures		Private Consumption Expenditures		General Government Consumption Expenditures		Gross Domestic Fixed Capital Formation		Net Increase in stock		International Export		Domestic Export		Total Final Demands	
Primary Industry	1970	220	6.1	5,351	11.1	237	1.4	1,087	3.3	123	11.5	429	9.7	13,348	25.6	20,831	13.4
	1975	190	4.1	5,042	7.5	165	0.9	1,051	2.2	98	35.6	305	5.9	11,689	22.3	18,539	9.5
	1980	213	3.8	5,072	6.3	214	1.0	1,143	1.9	△ 138	162.4	266	5.6	11,533	19.6	18,303	7.9
Secondary Industry	1970	626	17.4	11,146	23.2	1,488	8.5	26,161	79.9	650	60.8	3,164	71.7	27,246	56.1	70,481	45.2
	1975	667	14.3	14,666	21.8	1,304	7.5	37,386	78.5	45	16.4	3,913	75.7	29,311	55.9	87,292	44.8
	1980	825	14.9	16,134	20.2	1,775	8.2	45,962	77.1	29	-34.1	2,756	58.4	33,180	56.5	100,661	43.7
Mining	1970	10	0.3	226	0.5	30	0.2	406	1.2	23	2.2	87	2.0	2,623	5.4	3,405	2.2
	1975	8	0.2	145	0.2	18	0.1	480	1.0	△ 2	-0.7	83	1.6	2,086	4.0	2,817	1.4
	1980	16	0.3	235	0.3	42	0.2	982	1.6	△ 40	47.1	80	1.7	2,016	3.4	3,330	1.4
Manufacturing	1970	585	16.3	10,049	20.9	1,216	6.9	8,416	25.7	619	57.9	3,052	69.1	24,331	50.1	47,268	30.9
	1975	626	13.4	13,117	19.5	1,077	6.2	10,055	21.1	45	16.4	3,805	73.6	26,940	51.4	55,666	28.6
	1980	767	13.8	14,797	18.5	1,494	6.9	13,045	21.9	70	-82.4	2,639	55.9	30,828	52.5	63,640	27.6
Light	1970	492	13.7	8,098	16.8	780	4.3	3,154	9.6	346	32.4	887	20.1	14,626	30.1	28,363	18.2
	1975	483	10.3	9,703	14.4	562	3.2	4,080	8.6	△ 161	-58.5	756	14.6	15,640	29.8	31,062	15.9
	1980	593	10.7	10,655	13.3	803	3.7	5,129	8.6	104	-122.4	623	13.2	17,801	30.3	35,708	15.5
Chemicals	1970	31	0.9	582	1.2	87	0.5	464	1.4	50	4.7	216	4.9	2,014	4.1	3,444	2.2
	1975	71	1.5	1,909	2.8	219	1.3	909	1.9	△ 10	-3.6	353	6.8	4,767	9.1	8,219	4.2
	1980	87	1.6	2,182	2.7	306	1.4	1,084	1.8	△ 83	97.6	200	4.2	5,041	8.6	8,818	3.8
Metal	1970	34	0.9	475	1.0	100	0.6	2,171	6.6	1	14.0	1,391	31.5	6,578	13.6	10,902	7.0
	1975	38	0.8	468	0.7	67	0.4	2,391	5.0	221	80.4	1,803	34.9	5,269	10.0	10,258	5.3
	1980	54	1.0	744	0.9	98	0.5	3,642	6.1	0	0.0	1,311	27.8	6,142	10.5	11,990	5.2
Machinery	1970	28	0.8	894	1.9	267	1.5	2,626	8.0	73	6.8	559	12.7	1,113	2.3	5,560	3.6
	1975	34	0.7	1,037	1.5	230	1.3	2,674	5.6	△ 5	-1.8	893	17.3	1,265	2.4	6,127	3.1
	1980	33	0.6	1,215	1.5	287	1.3	3,191	5.4	48	-56.5	506	10.7	1,843	3.1	7,123	3.1
Construction	1970	31	0.9	872	1.8	241	1.4	17,338	53.0	7	0.7	25	0.6	293	0.6	18,808	12.1
	1975	33	0.7	1,404	2.1	208	1.2	36,845	56.4	2	0.7	25	0.5	285	0.5	28,809	14.8
	1980	42	0.8	1,103	1.4	239	1.1	31,935	53.6	△ 1	1.2	37	0.8	336	0.6	33,692	24.6
Tertiary Industry	1970	2,745	76.4	31,640	65.7	15,807	90.2	5,488	16.8	296	27.7	821	18.6	7,902	16.3	64,700	41.5
	1975	3,820	81.7	47,639	70.7	15,936	91.6	9,244	19.3	132	48.0	952	18.4	11,443	21.8	89,138	45.7
	1980	4,517	81.3	58,786	75.5	19,771	90.9	12,505	21.0	23	-27.1	1,697	36.0	14,006	23.9	111,305	48.3
Total	1970	3,591	100.0	48,138	100.0	17,532	100.0	17,532	100.0	1,069	100.0	4,415	100.0	48,533	100.0	156,013	100.0
	1975	4,677	100.0	67,347	100.0	17,405	100.0	17,405	100.0	275	100.0	5,170	100.0	52,443	100.0	194,969	100.0
	1980	5,555	100.0	79,992	100.0	21,760	100.0	21,760	100.0	△ 85	100.0	4,720	100.0	58,718	100.0	230,270	100.0

Relatively Low Activities

Source: Sapporo Branch of the Ministry of International Trade and Industry.  
 "Input-output Table Analysis of Hokkaido Economy in 1970-'75-'85" 1985.

Table 4-6. Changes of Inducement Effects by Each Item in Final Demands

Unit: 0.1 Billion yen

Index	year	Production Inducement			Production Inducement			Production Inducement			Production Inducement		
		value	%	coefficient	value	%	coefficient	value	%	coefficient	value	%	coefficient
Business Consumption Expenditures	1970	3,591	2.3	1.285378	2,049	2.7	0.733339	98	1.8	0.035166	646	2.2	0.231409
	1970 (A)	1,437	2.2	1.244757	786	2.4	0.681335	41	1.8	0.035159	327	2.2	0.283379
	1975	4,677	2.4	1.243030	2,728	2.8	0.724959	172	1.6	0.045773	862	2.2	0.229144
	1975 (A)	3,445	2.4	1.223146	2,014	2.8	0.715128	122	1.7	0.043234	680	2.2	0.241479
	1980	5,555	2.4	1.261271	3,119	2.8	0.708031	189	1.6	0.043010	1,096	2.3	0.248882
Private Consumption Expenditures	1970	28,138	30.9	1.150982	27,494	35.7	0.657383	1,828	33.2	0.043697	12,499	42.1	0.298853
	1970 (A)	20,503	31.0	1.090440	12,025	36.9	0.639553	715	32.2	0.038026	6,061	41.7	0.322328
	1975	67,347	34.5	1.120065	38,329	39.3	0.637460	4,005	36.7	0.066605	17,786	45.3	0.295853
	1975 (A)	49,051	34.6	1.094713	28,389	40.0	0.633585	2,676	37.5	0.059713	13,738	44.7	0.306601
	1980	79,992	34.7	1.136190	45,874	40.8	0.651581	4,271	36.2	0.060662	20,254	42.4	0.287685
General Government Consumption Expenditures	1970	17,532	11.2	1.375073	10,948	14.2	0.858713	237	4.3	0.018558	1,567	5.3	0.122882
	1970 (A)	6,555	9.9	1.399871	3,891	11.9	0.831049	94	4.2	0.020134	698	4.8	0.149132
	1975	17,405	8.9	1.321847	11,205	11.5	0.850971	372	3.4	0.028238	1,593	4.1	0.120987
	1975 (A)	12,912	9.1	1.316198	8,361	11.8	0.852351	238	3.3	0.024215	1,213	3.9	0.123658
	1980	21,760	9.4	1.317145	13,576	12.1	0.821756	588	5.0	0.035579	2,356	4.9	0.142616
Gross Domestic Fixed Capital Formation	1970	32,736	21.0	1.340333	15,320	19.9	0.627272	1,079	19.7	0.044163	8,004	27.0	0.327732
	1970 (A)	13,875	21.0	1.254135	6,012	18.5	0.543406	508	22.9	0.045912	4,531	31.1	0.409523
	1975	47,651	24.4	1.338042	22,372	23.0	0.628198	1,840	16.8	0.051672	11,395	29.0	0.319972
	1975 (A)	33,574	23.7	1.299807	15,147	21.3	0.586425	1,301	18.2	0.050349	9,376	30.5	0.363006
	1980	59,609	25.9	1.377517	25,546	22.7	0.590356	2,040	17.4	0.047374	15,673	32.8	0.362192
Net Increase in Stock	1970	1,069	0.7	0.890670	433	0.6	0.360816	93	1.7	0.077717	670	2.3	0.558133
	1970 (A)	490	0.7	0.768772	2,115	0.7	0.336941	45	2.0	0.069922	375	2.6	0.589246
	1975	275	0.1	1.277801	139	0.1	0.644230	-141	-1.3	-0.653403	212	0.5	0.983549
	1975 (A)	203	0.1	0.85507	110	0.2	0.481504	-69	1.0	-0.303036	183	0.6	0.738747
	1980	-85	0.0	-4.002526	-50	0.0	-2.347858	35	0.3	0.638785	37	0.1	1.760535
International Export	1970	4,415	2.8	1.945123	1,506	2.0	0.663689	183	3.2	0.076110	562	1.9	0.247783
	1970 (A)	2,050	3.1	1.931136	716	2.2	0.674605	71	3.2	0.066492	257	1.8	0.242005
	1975	5,170	2.7	1.837788	1,683	1.7	0.598241	300	2.7	0.106532	807	2.1	0.226827
	1975 (A)	3,611	2.5	1.879771	1,130	1.6	0.588418	186	2.6	0.096881	584	1.9	0.303879
	1980	4,720	2.0	1.827657	1,612	1.4	0.624258	195	1.7	0.075572	759	1.6	0.293780
Domestic Export	1970	48,533	31.1	1.789341	19,255	25.0	0.709922	1,976	36.0	0.072845	5,742	19.3	0.211698
	1970 (A)	21,204	32.1	1.755318	8,936	27.4	0.739449	748	33.7	0.061902	2,300	15.8	0.190434
	1975	52,443	26.9	1.636778	21,006	21.6	0.655615	4,376	40.1	0.136592	6,584	16.8	0.205486
	1975 (A)	38,913	27.5	1.652912	15,825	22.3	0.672190	2,683	37.6	0.113986	4,967	16.2	0.210987
	1980	58,719	25.5	1.674781	22,866	20.3	0.652190	4,469	37.9	0.127458	7,648	16.0	0.218137
Total Final Demands	1970	156,013	100.0	1.388220	77,006	100.0	0.685209	5,483	100.0	0.048787	29,691	100.0	0.264192
	1970 (A)	66,113	100.0	1.336140	32,582	100.0	0.658470	2,221	100.0	0.044879	14,550	100.0	0.294048
	1975	194,969	100.0	1.319679	97,462	100.0	0.659686	10,924	100.0	0.073944	39,242	100.0	0.265616
	1975 (A)	141,709	100.0	1.300608	70,978	100.0	0.651435	7,135	100.0	0.065489	30,742	100.0	0.282147
	1980	230,270	100.0	1.336710	112,543	100.0	0.653309	11,797	100.0	0.068480	47,824	100.0	0.277615

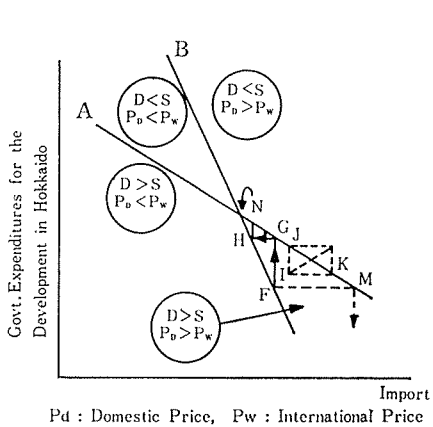
Source: Same as Figures 4-5. The figures in the bracket A show nominal one.

tion. Fig. 5-1 shows that the Hokkaido economy eventually heads toward L under present policies which are the result of the direction from I to J increasing public expenditure and the direction from I to K increasing imports. The L direction shows that domestic prices are still higher than international prices, which means an oversupply. Therefore domestic prices must be made close to international prices by controlling public financial expenditure up to N and decreasing imports in the future. Point N also shows where the balance of demand and supply is reached. This direction leads to protection of infant industry.

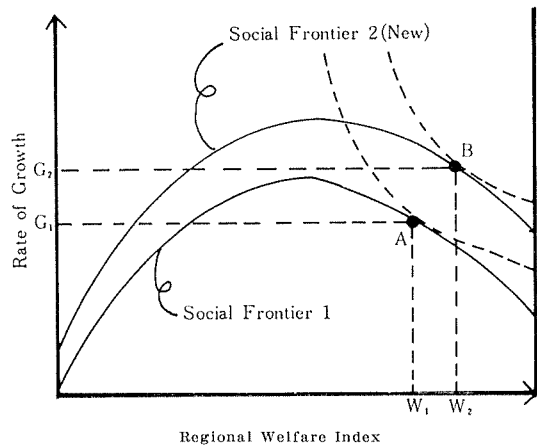
(2) Expansion of manufacturing industry in the industrial structure serves as a stimulus to service industry, resulting in increases in employment and population.

2) *To abolish differentials in the living environment to achieve a comfortable life.....Welfare policy*

Income growth and welfare policies will not conflict with each other due to technological innovation (Fig. 5-2).



**Figure 5-1.** Balanced Demand & Supply, Equilibrium price of the product in Hokkaido.



**Figure 5-2.** Growth and Welfare.

## 6. Theoretical background to the regional development strategy

At present the most important strategy for development in Hokkaido is to increase local income.

1) *The strategy for increasing local income by H. W. Richardson*

This strategy aims to increase the ratio of investment and exports to income, and to decrease the ratio of imports to income.

2) *Strategy for increasing local income by Dr. Kenichi Miyazawa*

The strategy aims to increase the added-value ratio of local products and the

self-sufficiency rate of materials for production as high as possible. It also requires an increase in the ratio of income and profit remaining in the region.

### 7. Details of Development Strategy

#### 1) Product Market

From a questionnaire to municipalities (Fig. 7-1), the main problem in developing local industry is to educate leaders and talented persons for private enter-

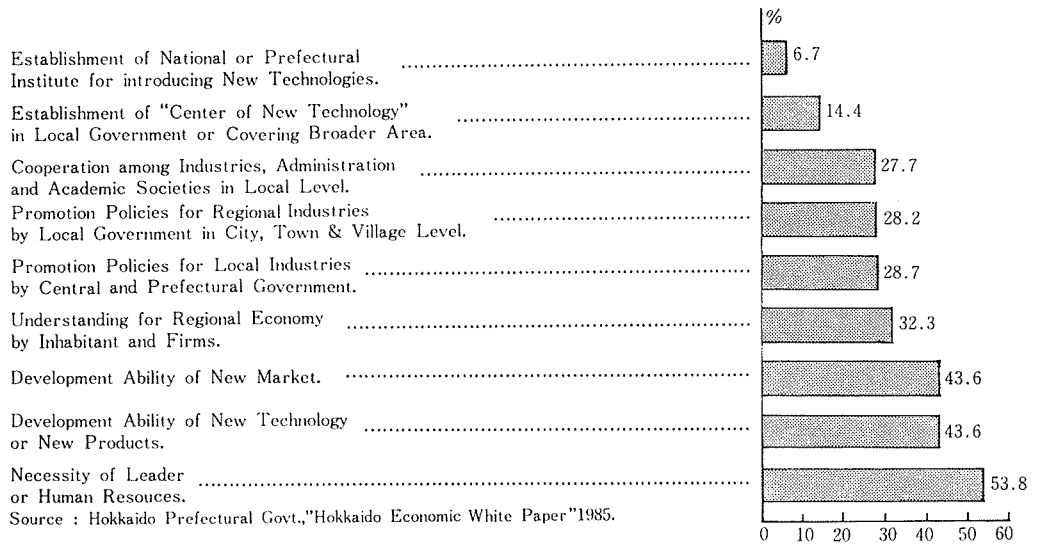


Figure 7-1. Problems of Regional Industries Pointed by Local Government.

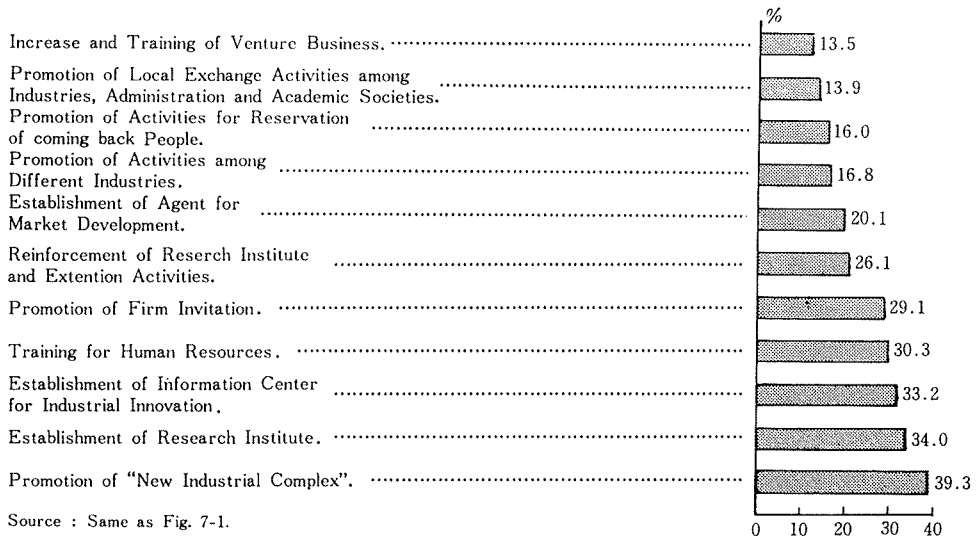


Figure 7-2. The Way to Prosperous Regional Industries Pointed by Manufacturing Firms.

prises and economic groups. Another problem is to develop new products and new markets.

As is shown in Fig. 7-2, persons from manufacturing industry consider that, to develop local industry, it is essential to promote the widest possible range of industries, to establish technological and information centers, and to improve research and development institutions.

Details of the strategies are given below with the results from the questionnaire.

- (1) To invite high tech industries from other prefectures and enlarge local industry
  - A. High tech industry is mainly considered to be (a) precision and general machine industry (ex. optical fiber, video cameras, robots, solar cells, aircrafts, rocketplanes, (automobiles), (b) chemical industry (ex. new materials, carbon fibers, drugs such as anti-cancer drugs), and (c) electrical appliances (ex. IC, computers, VTR, office automation equipment, audio equipment).
  - B. Conditions for inviting high tech industries are as follows; (a) For producing high added value and increase employment (b) To provide good establishment conditions such as water, (c) Low land prices, (d) Closeness to airports, (e) Favorable living environment including educational and cultural facilities, (f) To have public research and development institutions.
  - C. Cities that meet these requirements are Sapporo, Ebetsu, Asahigawa, Kushiro, Obihiro, and Kitami.
  - D. It is advantageous to invite central industries including related enterprises and subcontractors when possible.
- (2) To add high value to agricultural, forest, and marine products (Formation of Industrial Complexes)
  - A. The production system established in Denmark is to be introduced. In Denmark, goods of high value are made from primary products for export. Pigs are an example, toothbrushes are produced from the bristles, shoes from the skin, insulin from the pancreas, hormones from the pituitary gland, and cosmetics from the blood.
  - B. Therefore, like with the Danish system, an aim is to add high-value to agricultural, forest, and marine products in Hokkaido. A healthy industry can be developed considering that consumption of the aged and young women is increasing.
    - (a) Clothing products are characterized by sports wear, including sports shoes. The fur industry may be combined with the fashion industry.
    - (b) Agricultural and marine products used as raw materials to produce health foods, drugs (for adults), and cosmetics. For example, cultivation of mushroom is being increased, as they help checking cancer-causing substances. Further, new foods are made from



a mixture of butter and marine products, where the marine product serves to decrease the abundant cholesterol in the butter.

- (c) For forest products, new building materials have been made from chips of larch and cement, this is a good idea that can be further applied.
- C. High value added products made from agricultural, forest, and marine products must be promoted.
  - (a) Silicon and organic fertilizers made from rice hulls.
  - (b) Concentrated fodder made by enzymes and vitamins.
  - (c) Organic fertilizer made from rice and wheat straw, compost, wood chips, and shells.
  - (d) Artificial diamonds have been made from sake and there can be used to produce semiconductors, drill edges, and glasses.
  - (e) New ceramics are made from agricultural, forest, and marine products.
- D. Production prices are expected to come down by applying biotechnology to the production of raw materials (for B, C), by introducing robots, small aircrafts and remote sensors.

## 2) *Factor Market*

Results of questionnaire by the Hokkaido Government (Fig. 7-1, 7-2).

- A. To educate and settle enterprising businessmen and technical experts.
  - (a) To establish identity and to train in foresight, creativity, and decisionmaking.
  - (b) To cultivate a sense of production price and investment limits.
  - (c) To train in thinking of goal achievement not just directly but in different ways.
  - (d) Information of management and sales policy must be approached from the viewpoints of other industries.
  - (e) To educate brilliant leaders in industry.
- B. To improve research and development and especially educational institutions.
  - (a) To invite educational institution related to art and design and to educate in creativity and fashion sense.
  - (b) To establish industrial and technological centers especially for northern areas.
  - (c) It is important that industrial complexes should be promoted by cooperative projects between technological experimental stations and agricultural or marine experimental station.
- C. New media should be fully utilized to receive information from the world and propagate the information in Hokkaido.
- D. To simplify administrative procedures by decentralizing government authority.

- E. To improve social overhead capital
- (a) To internationalize Chitose Airport, relieving congestion at Narita International Airport, and to introduce jet-planes to small airports.
  - (b) To construct a network of expressways and a systematic local traffic network.
  - (c) To use commuter aircraft between central cities and advanced high speed trains between the central Hokkaido area and central city areas.
  - (d) To improve truck terminals and freight distribution terminals.

## 8. Conclusion

To improve the relatively depressed conditions in the Hokkaido economy to the national level, it is essential to accumulate capital inside Hokkaido, not only by inviting enterprises from other prefectures to Hokkaido but by developing local industry.

Therefore original and not stereo-type concepts are required. One is, for industrialization of Hokkaido, to target industries peculiar to Hokkaido. For example, clothing, food, and housing industries have the common aim of inducing healthy industry.

Another is, additional to healthy industries, to add high value to primary products.

To achieve this industrialization it is indispensable to educate and settle highly talented persons in Hokkaido.

## References

- 1) Bendavid-Val, A. (1983): *Regional and Economic Analysis for Practitioners*: Praeger Publishers, 58-66.
- 2) Economic Planning Board ed. (1984): *New Phase of Regional Economic Structure*: Printing Office in the Ministry of Treasury, 19-37.
- 3) Gyosei Co., Ltd. (1986): *Survey on Regional Development Plan in Japan*: Gyosei Publishing Co., Ltd, 2-14.
- 4) High Life Publishing Co., Ltd. (1980): *Forward Twenty-One Century*: High Life Publishing Co., Ltd, 236-239.
- 5) Kaneko, Y. (1984): *Location Theory by M. J. Beckmann*: Keisoh Shoboh, 185-190.
- 6) Kaneko, Y. (1983): *Industrial Structure*: Sekai-Shisoh Co., Ltd, 58-66.
- 7) Komatsu, K. (1982): *Modern Japanese Economy*: Toyoh Keizai Shinpoh Co., Ltd, 224-227.
- 8) Kuroyanagi, T. (1960): *Economic Structure in Primary Industry: Hokkaido Sangyo Chosakai ed., An Analysis of the Industrial Structure in Hokkaido*: Nihon Hyoron Shinsya, 313-331.
- 9) Kuroyanagi, T. (1980): *The Evaluation Criterion of the Development in Hokkaido*: Inaba S., Kobayashi, Y., Kuroyanagi, T., Taniuchi, T. and Hara, I.: *Challenges to Self-Sustaining Economy*: Nihon Keizai Newspaper Press Co., Ltd, 127-168.
- 10) Kuroyanagi, T. (1980): *Agriculture in Hokkaido*: Hokkaido Kaihatsu Mondai Chosakai, 3-8.

- 11) Kuroyanagi, T. (1982): Financial Problems in Big Urban City: MIKS Research Society: Growing City: Meibun Shoboh, 194-235.
- 12) Kuroyanagi, T. (1985): Hokkaido development Scheme in the Reform of the Administrative Structure: Hokkaido Mirai Sohgo Research Institute ed., Twenty-One Century in Hokkaido: Nihon Keizai Newspaper Press Co., Ltd, 138-150.
- 13) OECD (1977): Report on Methods of Measuring the Effects of Regional Policies, 17-29.
- 14) Saito, T. (1984): An Application and Strategies to Regional Development: Dai-ichi Hohki Publishing Co., Ltd, 131-135, 194-199.
- 15) Tahara, S. and Suzuki, T. (1977): Growth and Changes in Regional Economy: Gyosei, 69-75.
- 16) Yamazaki, M. (1979): Regional Industry in Japan: Daiiamond Co., Ltd, 313-345.
- 17) Yamazaki, M. (1984): The Way to Activated Regional Economy: Yubikaku, 77-88, 103-107.

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