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THE JAPANESE URBAN SYSTEM DURING A PERIOD OF
RAPID ECONOMIC DEVELOPMENT

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Preface

This paper reports on research undertaken within the context of the IIASA research task on Human Settlement Systems: Development Processes and Strategies. It is one of a series which examines the nature and significance of the Japanese urban system in an international context. Professor Glickman has written three other papers (RM-77-39, PM-77-47, and RM-77-48) and Professor Tatsuhiko Kawashima has written another (RM-77-25).

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17. Tatsuhiko Kawashima, *Changes in the Spatial Population Structure of Japan*, RM-77-25, June 1977.
18. Norman J. Glickman, *Growth and Change in the Japanese Urban System: The Experience of the 1970s*, RM-77-39, July 1977.

1. INTRODUCTION

This essay outlines the evolution of the Japanese urban system during a period of significant economic growth. Between 1950 and 1970, the era under study here, the Japanese economy recovered from extensive war damage, consolidated, and transformed itself into one of the most important industrial powers in the world. Between 1953 and 1971, for instance, real GNP increased by nearly 9 percent per year.¹ This remarkable economic growth was accompanied by rapid urbanization--the flow of population from rural to urban regions--which was spectacular by most standards, as we shall see in Section 5. Between 1955 and 1960, 39 of Japan's 46 prefectures lost population and in 1961, net migration to the three major metropolitan areas from other regions totaled nearly 600,000. By 1970, the population of the Tokyo, Osaka and Nagoya regions (as measured by prefectural data²) had reached 45.6 million people (43.9 percent of Japan's population), ten million more than in 1960. Population density in Tokyo prefecture increased by over 70 percent between 1950 and 1970 while many rural regions were becoming relatively depopulated. Thus, there was high density urban concentration existing simultaneously with rural depopulation. The government called for deconcentration policies for the urbanized regions and economic development policies for the poorer underdeveloped areas (as we note in Glickman [1977b]) to remedy this situation of polarity.

But the nature and dimensions of Japanese urban growth has not been rigorously analyzed. Therefore, in what follows we present an investigation into the evolution of the Japanese urban system during the period from 1950 to 1970. Although there have been several studies of Japanese cities³, this work

¹For analyses of the growth process see Patrick and Rosovsky [1976], Denison and Chung [1976] and Glickman [1977b].

²We will return to a discussion of these data in Section 2.3.

³Among the many studies of Japanese urbanism, one should include Isida [1969], Kornhauser [1976], Mills and Ohta [1976], Orishima [1973] and Yamaguchi [1969].

attempts to be comprehensive in its coverage. Whereas most other studies have either centered on Tokyo and a few other large cities or have looked at many individual cities, this research aims at viewing a large number of metropolitan regions in their spatial, demographic and industrial dimensions.

We introduce a new concept to the study of Japanese urban development: a measure of urban regions by reference to their functional economic areas. That is, we observe the commuting patterns and urban character of unified economic regions-- that is, central cities and their suburbs--and analyze urban growth using the resulting regional configurations. We call this unit the "Regional Economic Cluster." Section 2 details the precise definition of the REC and the data collection process. The analysis of these data are the concern of Sections 3 and 4. We investigate several interrelated questions there:

- (1) What have been the changes within the Japanese system of cities?
- (2) Has the system become more or less centralized during the 1950s and 1960s?
- (3) What have been the shifts within metropolitan regions with respect to population and employment?
- (4) To what extent has there been metropolitan decentralization, i.e., suburbanization, during those years of high economic growth?

In Section 5, we observe the development of the Japanese urban system in comparison to other developed and less developed nations such as Great Britain, the United States, the Federal Republic of Germany, and India. We offer some concluding remarks in Section 6.

2. ANALYTIC UNITS: REGIONAL ECONOMIC CLUSTERS AND STANDARD CONSOLIDATED AREAS

2.1 Definition of Regional Economic Clusters

As noted in Section 1 it was necessary to find a meaningful measure of urbanization. In designing research, it was useful to have a definition that would be consistent with efficient methods of data collection as well. In this research

a significant data-related problem was encountered: the Japanese government collects data primarily for individual cities (shi), towns (machi), villages (mura),⁴ and prefectures (ken, to and fu), not on a functional urban region basis. If, however, one views urbanization only in terms of individual cities or prefectures, one may miss suburbanization effects and ignore the interaction among cities. Rather, a more meaningful aggregation technique involves a system in which a central city and its surrounding hinterland are combined into regions. Thus it is necessary to have a classification scheme similar to that of the United States Standard Metropolitan Statistical Area⁵ (SMSA) or the British Standard Metropolitan Labour Area (SMLA) or Metropolitan Economic Labour Area (MELA).⁶ Since we want to compare Japanese urban growth with that of other nations such as the United States and the United Kingdom (Section 5.), such

⁴There were a total of 3,276 cities, towns and villages in Japan in 1970. Some regional data are available for 1970, but only for the seven metropolitan areas.

⁵The Standard Metropolitan Statistical Area (SMSA) is defined as a set of counties having a core of a city (or twin cities) with population of 50,000 or more and surrounding counties having "metropolitan character" and "metropolitan integration". Metropolitan character requires that at least 75 percent of the labor force is nonagricultural and has a population density of 58 persons per square kilometer. If 15 percent of resident workers commute to the central county (or counties) or if 25 percent of those working in a county live in the central county (or counties) then the metropolitan integration criterion is fulfilled. This definition has been criticized and extended by Berry [1973a, 1973b] and applied to Kanagawa-ken by Nagashima [1974].

⁶Standard Metropolitan Labour Areas (SMLAs) have been defined for Great Britain. They involve criteria for metropolitan character with a labor center or core and metropolitan ring areas related to the core. The labor center is defined with respect to employment density (2.02 jobs per hectare), total employment (20,000 jobs) and contiguous spatial arrangement of subareas.

The Metropolitan Economic Labor Area (MELA) consists of the SMLA and an outer metropolitan ring less strongly related to the core. Whereas "metropolitan integration" for the SMLA includes areas sending 15 percent of resident employed to the core, the MELA includes areas sending commuters to the core provided they don't send more to another core.

comparative research is facilitated by this analysis being undertaken on a basis similar to the analyses of those countries. In order to carry out this research, we specified a set of "Regional Economic Clusters" (RECs) and "Standard Consolidated Areas" (SCAs) which included central cities and the cities, towns, and villages in the central city's commuting fields. The RECs are defined in Sections 2.1.1 and 2.1.2 and the SCAs are defined in Section 2.1.3.

2.1.1 Choice of Central Cities of Regional Economic Clusters

First, it was necessary to choose a set of central cities. There were three criteria for choosing a potential central city:

- 1 (a) The 1970 population must be greater than 100,000 persons.
- 1 (b) The ratio of daytime to nighttime population must be greater than one.
- 1 (c) Seventy-five percent of the economic households are employed in nonagricultural or "mixed" nonagricultural-agricultural pursuits.

Criteria 1 (a) allowed us to eliminate small cities and reduce to approximately one hundred and fifty the potential number of central cities; in terms of research design this also made the data collection process more manageable. Criteria 1 (b) was added to exclude cities which had net outcommuting during the day. These cities were primarily those near large urban centers which sent large numbers of workers to the large centers during the work day. We included criteria 1 (c) so that the central cities had a substantially urban character; one measure of urbanization is the way in which residents of a particular city are employed, and we included only cities in which workers were employed in substantially nonagricultural pursuits.

If criteria 1 (a)-1 (c) were met, the city was classified as a potential central city. Since there was the problem of central cities being located very close to each other, we had to take account of the possibility of "twin-cities" and/or relationship between central and satellite cities. Thus we

added criteria 1 (d) and 1 (e):

- 1 (d) The minimum distance between potential central city A and potential central city B must be greater than some arbitrary distance ℓ . If the distance between the cities is greater than ℓ , then both A and B are central cities. We used $\ell=20$ kilometers as the cut-off point.
- 1 (e) If the distance between the cities is less than ℓ , then the central city is determined by the criteria that the number of commuters from city A to city B is greater than or less than the number of commuters from city B to city A. If the number of commuters going from A to B is greater, then A is central city and B is the satellite city.

2.1.2 The Choice of Municipalities for the Rings in the Regional Economic Clusters

The next problem concerned selecting the towns (machi), satellite cities (eiseitoshi) and villages (mura) which are in the commuting fields of the central cities determined in Section 2.1.1 above. We set four criteria for the classification of cities, towns and villages within regions so that functional urban regions resulted:

- 2 (a) The number of commuters from the satellite cities, towns or villages to city A must be greater than 500. This eliminated many small cities, towns, and villages from the commuting ring.
- 2 (b) The ratio of commuters in each city/town/village to city A to total employment in each city/town/village must be greater than five percent.

Since it is possible for conditions 2 (a) and 2 (b) to hold for more than one central city, then:

- 2 (c) The town or village would be classified as part of region A if more commuters went to A than to B.

Finally, to guarantee urban character for the rings:

- 2 (d) Seventy-five percent of the economic households must be employed in nonagricultural or mixed nonagricultural-agricultural pursuits.

This process yielded a definition of the Japanese analogy of the SMSA. The definitions are not exactly the same because of data constraints, but the spirit of the RECs and SMSAs are consistent. Both are functional urban regions.

2.1.3 Definition of Standard Consolidated Areas

Since we also wanted to isolate significant agglomerations of population, we defined a set of regions which we call Standard Consolidated Areas (SCAs). These consisted of three or more contiguous RECs. Such regions also exist for the United States (with the same name, although not exactly the same definition, for agglomerations of SMSAs) for major metropolitan centers such as New York and Chicago.

A listing of the component municipalities of the RECs is given in Appendix 1 and the RECs which make up the SCAs are listed in the body of Table 3.

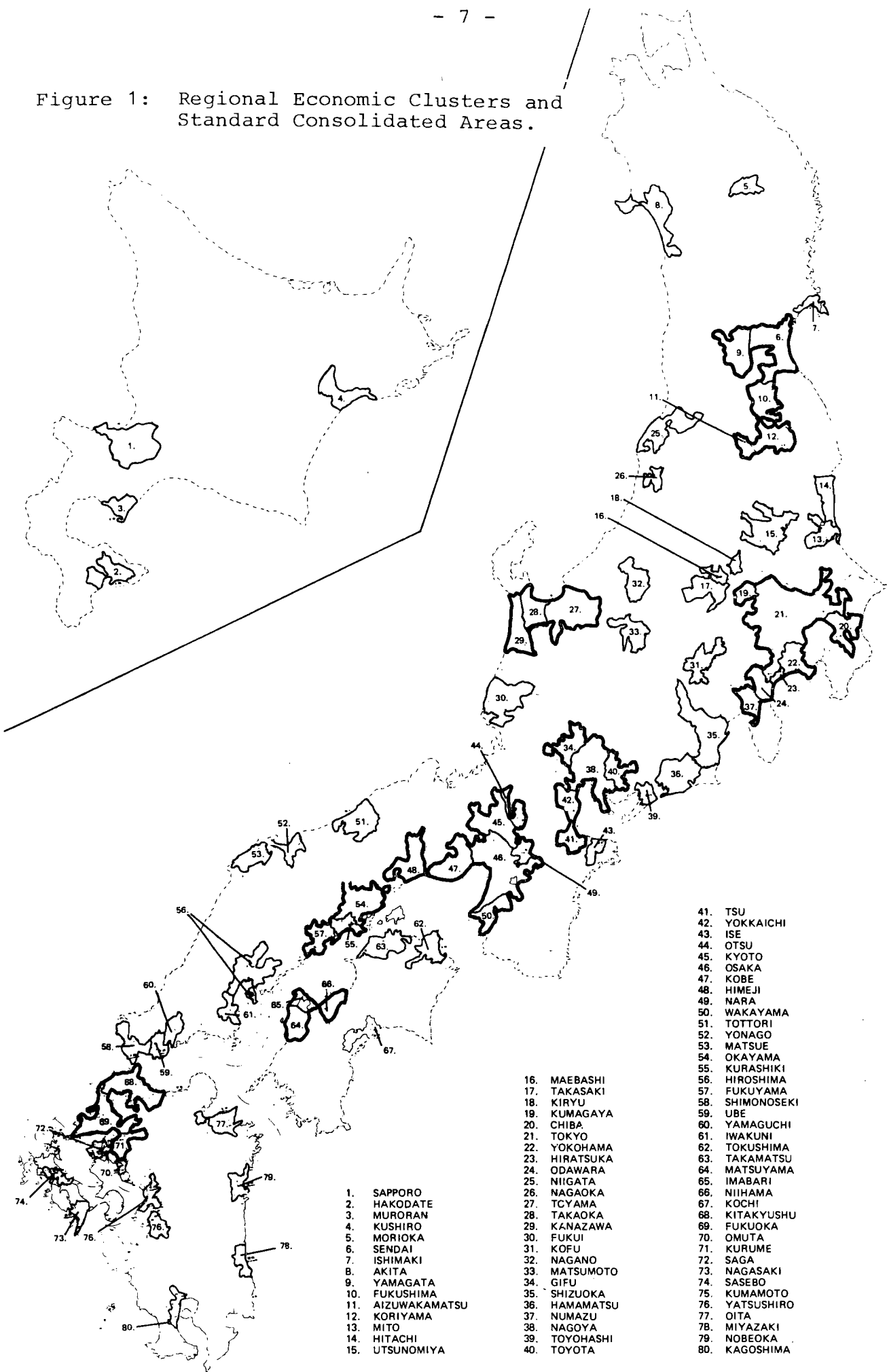
2.2 Data Collection

The process of hand-collecting (data were not available in machine-readable form) and coding of data yielded eighty RECs as defined in Sections 2.1.1 and 2.1.2.⁷ In all there are 903 cities, towns and villages in the RECs: four RECs on the northernmost island of Hokkaido, fifty-seven on the island of Honshu, six on Shikoku and thirteen on Kyushu. Okinawa was ignored since it did not revert to Japan until after 1970. The spatial configuration of the RECs are given in Figure 1.

Data were collected for a large number of economic, social and political variables for each of the component municipalities of the RECs. The resulting data collection have been coalesced into our Regional Data Bank listed in Appendix 2. This data bank is available to interested researchers and is capable of being easily up-dated and expanded. For example, we originally collected data for 1950 through 1970, but later added 1975 population figures for 1975 in order to complete Glickman [1977a].

⁷Kawashima [1977] using the same data set and similar classification procedures, defined 84 regions called "J-SMSAs".

Figure 1: Regional Economic Clusters and Standard Consolidated Areas.



There are 8 SCAs, comprising 33 RECs. The RECs of the SCAs have the heavily-scored boundaries in Figure 1. Note the nearly continuous urbanized area stretching from the Kanto plain (RECs 19-24, and 37) to the Kinki region (RECs 44-50) in Figure 1. There are some breaks in this built-up area between Hamamatsu (#36) and Toyohashi (#39) and larger rural areas between the Nagoya area and the set of RECs which surround Osaka. Other concentrations of urban centers exist near Sendai (RECs 6, 9, 10, and 12), Okayama (RECs 54, 55, and 57), Kitakyushu (RECs 68, 69, and 71), Matsuyama (RECs 64-66) and Kanazawa (RECs 27-29).

One further note relating to Figure 1. Much has been made of the term "megapolis" (see Gottmann, [1961]) and its application to Japanese cities. The term megapolis has been applied to the Tokaido region which stretches from north of Tokyo to west of Kobe. Unfortunately, there is little agreement among Japanese urbanists as to a precise definition of the Tokaido megapolis. Gottmann's definition is itself not completely precise and this too has led to certain definition problems; see, for instance, JCADR [1973]. From Figure 1 it appears that the Tokaido region consists of the Tokyo, Nagoya, Osaka and Okayama Standard Consolidated Areas and a few RECs such as Shizuoka, Hamamatsu and Toyohashi. The rest of what is known as the Tokaido megapolis is primarily rural according to our analysis as it is depicted in Figure 1. One could, therefore, view this megapolis as a set of interrelated large urban regions (Tokyo, Osaka, etc.) combined with some non-urban intervening areas. A further discussion of the Tokaido region appears in Section 3.5.

2.3 The Nature of the Regional Economic Clusters and Standard Consolidated Areas

One of the advantages of the REC definition is that RECs form natural economic regions. That is, they relate cities within the same commuting field. Also, the RECs can vary in size and can cross prefectural boundaries. Other regions for Japan have been defined by the Economic Planning Agency. In

the cases of the Economic Planning Agency (EPA) definitions, prefectural boundaries are strictly adhered to and no calculation of commuting areas is made, with the exception of some definitions of major metropolitan areas for 1970. As an example, the Tokyo metropolitan area is defined by the EPA in two ways. First, there is Coastal Kanto which consists of the Tokyo, Kanagawa, Chiba, and Saitama prefectures. There is a still more encompassing definition of Tokyo which also includes the inland portions of the region: Ibaraki, Tochigi and Gumma prefectures. However, there are many portions of these regions which make them unsuitable for inclusion as part of the urbanized portion of the Tokyo urban region. Many of them are significantly rural and/or do not send many commuters to Tokyo during the work day. They should not, under reasonable economic criteria, be included in the Tokyo region. The same argument holds for other satellite cities of the central cities of other RECs. Although our classification system requires more effort to collect data and to process it, we feel that it is a preferable urbanization measure to the simpler prefecture-based versions.

Another advantage of the REC data system lies with its coverage of cities beyond the confines of the major metropolitan centers. For purposes of both normative and positive analyses, it is important to catalogue activity in regions such as Sendai or Hiroshima which are not covered by current central government data systems, at least in the sense of this essay.

Our regions vary greatly in size. For instance, the Yamaguchi REC has only two cities (Yamaguchi and its suburb Oguri) in Yamaguchi prefecture and a total 1970 population of 117, 000 persons.⁸ On the other hand, the Tokyo REC covers 106 municipalities in portions of 6 prefectures (Tokyo, Ibaragi, Tochigi, Saitama, Chiba and Kanagawa) and had a 1970 population over 17 million; the Tokyo SCA (with more cities in the same prefectures) had nearly 23 million people in 1970.

Table 1 gives some comparative data for our RECs and SCAs and those regions defined by the Economic Planning Agency

⁸We amended our analysis to exclude regions which had no suburban ring. Monocentric regions were inconsistent with some of the analysis in this paper and Glickman [1977a]. This was a decision which eliminated Aomori, for instance, from our original list of RECs.

Table 1

Population of RECs and SCAs Compared to
EPA Prefectural Definitions, 1950-1970

	(000)			Ratio of 1970 Population to 1950 Population
	1950	1960	1970	
Tokyo REC	8,857	13,099	17,712	2.000
Coastal Kanto ^a	13,051	17,864	24,113	1.848
Tokyo SCA	11,727	16,675	22,940	1.956
Inland and Coastal Kanto ^b	21,114	25,767	32,214	1.526
Osaka REC	4,784	6,781	9,495	1.985
Coastal Kinki ^c	8,149	10,413	13,331	1.636
Osaka SCA	8,762	11,405	15,032	1.716
Inland and Coastal Kinki ^d	11,617	14,030	17,401	1.498
Nagoya REC	2,462	3,268	4,123	1.675
Chukyo Region ^e	6,396	7,330	8,688	1.358

^aTokyo, Chiba, Kanagawa, and Saitama prefectures.

^bThose prefectures in footnote a plus Ibaraki, Tochigi, and Gumma prefectures.

^cOsaka, Kyoto and Hyogo prefectures.

^dThose prefectures in footnote b plus Nara, Wakayama and Shiga prefectures.

^eAichi, Gifu and Mie prefectures.

for the three major metropolitan areas. In all cases the EPA definitions include more population. For instance, the four-prefecture definition of Coastal Kanto contains 24.1 million people compared to the Tokyo REC figure of 17.7 million. The more-encompassing EPA definition of Kanto (which includes the inland portions), exceeds our Tokyo SCA population as well. Similar ratios exist for our and the EPA definitions of the other metropolitan areas. Reflecting the greater emphasis on urban regions given by the RECs, the RECs and SCAs are growing faster than the EPA regions. The Tokyo REC population doubled between 1950 and 1970 (see column 4 of Table 1), while Coastal Kanto increased by 85 percent. In all other cases, the REC/SCA regions' growth exceeded that of the EPA regions.

3. THE GROWTH OF THE JAPANESE URBAN SYSTEM, 1950-1970

3.1 Some Basic Data for Regional Economic Clusters and Standard Consolidated Areas

Table 2 shows some basic data for the RECs and compares these data with that for Japan as a whole. The total population of the eighty RECs is 70.4 million persons in 1970, 67.9 percent of the 103.7 million persons in all of Japan. Similarly, total employment in the RECs is 34.9 million workers as compared to 52.0 million for Japan. Consequently, the RECs have 67.2 percent of all workers in the country. Within the detailed employment categories, manufacturing and wholesale and retail involve 78.8 and 77.4 percent respectively of the total workers in those categories. Also, nearly 79 percent of all white collar employees reside within the Regional Economic Clusters. Column 2 of Table 2 shows the average number of residents and employees within the Regional Economic Clusters. There are 77,232 persons residing within the average municipality within the Regional Economic Clusters⁹ and a mean of 38,674 employees (of which 11,720 are in manufacturing).

⁹Compared to about 32,000 for the average municipality in all of Japan.

Table 2

REGIONAL ECONOMIC CLUSTERS
 MAJOR ECONOMIC VARIABLES, 1970
 (000)

	(1) <u>TOTAL REC</u>	(2) <u>MEAN</u>	(3) <u>TOTAL, JAPAN</u>	(4) <u>REC/JAPAN</u> <u>(1)/(3)</u>
POPULATION	69,818.4	77.232	103,720.1	67.3%
TOTAL EMPLOYMENT	34,961.6	38.674	52,041.7	67.2
PRIMARY EMPLOYMENT	3,410.3	3.772	10,006.1	34.1
SECONDARY EMPLOYMENT	13,349.3	14.767	17,651.4	75.6
MANUFACTURING EMPLOYMENT	10,594.7	11.720	13,442.4	78.8
WHOLESALE & RETAIL EMPLOYMENT	7,748.4	8.571	10,013.8	77.4
SERVICES EMPLOYMENT	5,456.5	6.036	7,658.8	71.2
GOVERNMENT EMPLOYMENT	1,214.4	1.343	1,740.1	69.8
WHITE COLLAR WORKERS	10,095.6	11.178	12,806.3	78.8

These data clearly indicate the comprehensive coverage of the RECs and SCAs. The REC definition does not exhaust all Japanese national territory, as does Berry's [1973a] Daily Urban Systems for the U.S., but it gives coverage of the primary urban activity in Japan. Most of the 2,373 cities, towns and villages not included in the RECs are rural (their average population is 14,685 persons) in character and, therefore, not of primary interest to this study.¹⁰

Table 3 shows the RECs which constitute the SCAs and the 1970 population of each. Note the heavy concentration in the Tokyo (22,940,400 people), Osaka (15,032,200 people) and Nagoya (6,082,700 people) Standard Consolidated Areas. The Matsuyama, Kanazawa and Okayama SCAs are the smallest. In total, the SCA population is 53,147,200, 75.4 percent of the total REC population and 51.2 percent of the total population of Japan. In comparison with other industrialized countries this is startling concentration.

For a presentation of data for individual Regional Economic Clusters, see Appendix 3. There we indicate total population and employment as well as the percent distribution for each employment category.

3.2 Regional Growth and Industrial Structure

Table 4 indicates population and total employment levels, growth rates, and industrial structure for all of the RECs between 1950 and 1970. It is seen that population grew at similar rates for both decades: 24.5 percent between 1950 and 1960 and 24.0 percent between 1960 and 1970. Total employment grew at a rate of 33.1 percent between 1960 and 1970, much higher than for Japan as a whole. For individual industrial groupings, there was a large fall in the share of primary

¹⁰ Work is currently underway at the International Institute for Applied Systems Analysis (Laxenburg, Austria) by Professor Tatsuhiko Kawashima and me to extend the REC definitions to exhaust the entire country, consistent with the Berry work.

Table 3

POPULATION OF JAPANESE STANDARD CONSOLIDATED AREAS, 1970

(000)

<u>Sendai SCA</u>		<u>Nagoya SCA</u>		<u>Kanazawa SCA</u>		<u>Osaka SCA</u>	
Sendai	975.6	Nagoya	3795.6	Toyama	493.5	Osaka	9495.2
Yamagata	391.3	Toyota	445.1	Takaoka	364.1	Kyoto	1809.4
Fukushima	327.0	Gifu	749.6	Kanazawa	540.3	Kobe	1741.0
Koriyama	332.7	Tsu	312.1	TOTAL SCA	1397.9	Himeji	782.6
TOTAL SCA	2026.6	Yokkaichi	453.3			Wakayama	563.1
		TOTAL SCA	6082.7			Nara	284.7
						Otsu	356.2
						TOTAL SCA	15032.2
<u>Tokyo SCA</u>		<u>Okayama SCA</u>		<u>Matsuyama SCA</u>		<u>Kitakyushu SCA</u>	
Tokyo	17711.5	Okayama	641.8	Matsuyama	428.5	Kitakyushu	1501.6
Yokohama	3323.8	Kurashiki	418.5	Imabari	171.2	Fukuoka	1324.4
Chiba	816.0	Fukuyama	544.9	Niihama	193.2	Kurume	443.4
Kumagaya	269.5	TOTAL SCA	1605.2	TOTAL SCA	792.9	TOTAL SCA	3269.4
Hiratsuka	234.4						
Odawara	283.7						
Numazu	421.5						
TOTAL SCA	22940.4						

Table 4

Growth Rates of Population and Employment by Industrial Class
in Japanese RECs, 1950-1970

	<u>1950</u>	<u>1960</u>	<u>Percent Change in Population and Total Employment and Percent Change in Share 1950-1960</u>	<u>1970</u>	<u>Percent Change in Population and Total Employment and Percent Change in Share 1960-1970</u>
Population (000)	45491.712	56651.491	24.531	70268.576	24.037
Total Employment (000)		26264.958		34952.627	33.077
Percent Primary Employment		18.448		9.747	-47.161
Percent Secondary Employment		35.953		38.188	6.217
Percent Wholesale & Retail Employment		18.967		22.164	16.855
Percent Services Employment		13.806		15.607	13.044
Percent Other Teritary Employment		9.415		10.820	14.922
Percent Government Employment		3.411		3.474	1.825

employment (47.2 percent) and small gains in the shares of government (1.8 percent) and secondary (6.2 percent) industry. Major proportional growth occurred in the shares of wholesale and retail employment (16.9 percent), services (13.0 percent) and other tertiary industry (14.9 percent). Thus there was a large relative expansion in the tertiary sector at the expense of primary and secondary employment. This is further revealed in Section 4.3.

Table 5 gives the percent change in population for five-year intervals between 1950 and 1970 for individual RECs. This table indicates that the cities with the largest growth were primarily those near Tokyo and Osaka. These include Tokyo, Yokohama, Chiba, Hiratsuka, in addition to Sapporo and Osaka. Those cities losing population absolutely were Tottori, Omuta, Yatsushiro, and Ube, all at the periphery of the urban system. One can see some levelling of the growth rates in the latter part of the period of the study. That is, the cities which grew the fastest for the 1950-1970 era, grew less quickly during the period of 1965-1970 than earlier; conversely, cities which previously grew the slowest seemed to grow less slowly (or to have less negative growth) during 1965-1970. As we show in Glickman [1977a] this trend continued into the 1970s.

One can also see that the period 1960-1965 brought with it a burst of urbanization in the larger cities and some draining down of the population of the smaller and more peripheral cities. In general, 1960-1965 found fast-growing cities registering their highest growth rates among the four periods and the slower-growing cities having their slowest growth then.

Among the major metropolitan centers, Tokyo's growth rate declines in each period: from 24.5 percent (1950-1955) to 13.7 percent (1965-1970). The outlying suburban areas of Chiba and Hiratsuka increased their growth rates with the passage of time; Chiba, for instance, grew only at a rate of 6.2 percent from 1950 to 1955, but grew by 31.5 percent from 1965 to 1970. Osaka's growth rate declined in each period, except for 1960-1965.

Table 5
Growth Rates of Population for Individual RECs, 1950-1970

	% CHANGE 1950-1955 -----	% CHANGE 1955-1960 -----	% CHANGE 1960-1965 -----	% CHANGE 1965-1970 -----	% CHANGE 1950-1970 -----
SAPPORO	18.589	18.227	24.440	18.977	76.958
HAKGDATE	5.686	0.318	3.092	3.700	13.345
MURORAN	11.812	16.260	12.911	4.814	53.866
KUSHIRO	24.421	25.153	12.256	7.812	88.456
MORIOKA	10.695	9.274	11.676	10.833	49.988
SENDAI	6.549	5.863	6.120	11.359	35.808
ISHIRAKI	1.887	2.935	2.813	6.203	14.515
AKITA	3.639	2.716	1.911	4.111	13.166
YAMAGATA	0.223	0.402	-0.245	2.403	2.791
FUKUSHIMA	7.969	0.051	2.164	4.254	15.078
AIZUWAKAMATSU	4.103	0.864	0.759	0.403	6.225
KORIYAMA	24.547	-15.996	2.252	5.219	12.564
MITO	6.173	3.342	5.962	8.771	26.484
HITACHI	6.560	10.925	4.176	1.128	24.527
UTSUNOMIYA	1.762	0.163	4.316	7.826	14.649
MAEBASHI	4.177	0.783	6.369	8.943	20.662
TAKASAKI	2.641	2.650	4.323	6.196	16.732
KIRYU	2.276	-0.086	3.750	4.702	11.006
KUMAGAYA	1.586	-0.987	4.073	7.172	12.187
CHIBA	6.246	8.490	19.453	31.468	81.016
TOKYO	23.722	19.537	18.922	13.695	99.965
YOKOHAMA	17.146	16.116	28.429	24.613	117.692
HIRATSUKA	13.322	6.787	22.922	22.452	82.165
ODAWARA	8.603	6.913	12.766	7.725	41.047
NIIGATA	4.917	2.784	4.375	4.448	17.563
NAGAOKA	7.501	1.484	2.532	2.724	14.906
TOYAMA	4.716	3.668	0.502	2.776	12.130
TAKAOKA	1.820	-0.561	-1.148	0.212	0.299
KANAZAWA	6.752	3.159	5.163	6.374	23.215
FUKUI	1.148	1.704	1.778	1.181	5.936
KOFU	5.297	-1.093	0.961	3.852	9.197
NAGANO	4.736	0.569	2.937	4.564	13.375
MATSUMOTO	0.328	1.954	2.335	4.899	9.805
GIFU	9.986	6.213	10.823	8.973	41.080
SHIZUOKA	11.493	7.959	8.040	8.149	40.642
HAMAMATSU	15.405	3.710	4.753	6.205	33.156
NUMAZU	8.420	8.511	13.295	12.443	49.673
NAGOYA	11.534	19.002	15.675	9.068	67.455
TOYOHASHI	6.198	3.447	6.810	-9.497	8.184
TOYOTA	18.609	9.692	17.120	22.143	86.219
TSU	3.767	-0.516	2.837	4.274	10.698
YOKKAICHI	5.438	5.316	9.597	7.623	30.977
ISE	2.475	0.290	2.036	0.596	5.493
OTSU	3.423	2.658	6.634	10.516	25.121
KYOTO	9.172	5.460	8.850	10.007	37.864
OSAKA	20.423	17.698	21.990	14.781	98.460
KOBE	16.704	9.588	10.168	9.614	54.445
HIMEJI	2.369	3.672	7.372	6.841	21.748
NARA	6.280	1.906	14.456	21.331	50.404
WAKAYAMA	7.268	3.022	6.863	7.282	29.064
TOTTORI	4.337	-2.374	-2.259	-0.504	-0.965
YONAGO	5.182	-0.752	0.523	2.052	7.091
MATSUE	3.997	-0.317	-0.921	1.687	4.446
OKAYAMA	5.694	2.523	3.748	6.979	20.267
KURASHIKI	17.701	1.407	5.415	17.755	48.160
HIROSHIMA	11.998	10.490	16.456	14.794	65.486
FUKUYAMA	2.095	1.727	3.190	10.974	18.933
SHIMONOSEKI	10.182	2.751	0.045	-0.970	12.165
URE	6.076	2.190	-9.137	-3.984	-5.429
YAMAGUCHI	4.598	2.666	-2.466	2.307	7.221

Table 5 (continued)

	POPULATION (1000'S)				
	% CHANGE 1950-1955	% CHANGE 1955-1960	% CHANGE 1960-1965	% CHANGE 1965-1970	% CHANGE 1950-1970
IWAKUNI	10.619	5.612	-1.038	4.873	21.249
TOKUSHIMA	6.417	0.249	1.092	2.566	10.615
TAKAMATSU	1.766	-0.731	0.306	3.655	5.035
MATSUYAMA	7.185	4.997	6.910	6.668	30.746
IMABARI	1.724	0.734	1.027	3.357	6.998
NIHAMA	3.105	0.952	-1.387	-0.674	1.952
KOCHI	5.652	2.886	5.764	6.800	22.784
KITAKYUSHU	13.438	7.419	-0.181	-0.933	20.500
FUKUOKA	12.872	8.700	10.326	12.859	52.768
OMUTA	4.329	-0.146	-5.760	-9.160	-10.918
KURUME	7.378	-1.257	-2.053	0.816	4.887
SAGA	6.325	-0.531	-3.107	-0.260	1.490
NAGASAKI	11.443	7.755	3.383	4.150	29.259
SASEBO	13.541	-0.823	-7.932	-0.453	3.205
KUMAMOTO	14.869	5.437	6.636	6.875	38.031
YATSUSHIRO	6.546	0.901	-4.255	-3.306	-0.471
OITA	7.624	2.203	6.800	8.360	27.296
MIYAZAKI	8.624	4.649	8.418	10.474	36.152
NOBEOKA	11.159	3.909	0.626	3.360	20.131
KAGOSHIMA	13.474	3.649	7.905	7.398	36.302

Growth Rates of Employment for Individual
RECs 1960 - 1970
(000) (percent)

	1960	1965	% CHANGE 1960-1965	1970	% CHANGE 1965-1970
SAPPORO	370.424	494.253	33.429	608.418	23.098
HAKODATE	121.837	138.641	13.792	151.884	9.552
MURORAN	78.916	93.832	18.901	104.751	11.637
KUSHIRO	66.514	80.312	20.745	92.859	15.623
MORIOKA	73.999	88.874	20.102	102.684	15.539
SENDAI	337.504	387.015	14.670	457.663	18.255
ISHIMAKI	56.829	59.697	5.047	68.224	14.284
AKITA	154.556	164.202	6.241	165.488	12.963
YAMAGATA	185.754	191.115	2.886	208.756	9.231
FUKUSHIMA	143.103	152.199	6.356	169.456	11.338
AIZUWAKAMATSU	52.199	55.606	6.527	61.491	10.583
KORIYAMA	140.304	146.609	4.494	167.850	14.488
MITO	168.505	180.261	6.977	205.161	13.613
HITACHI	146.354	154.531	5.587	164.662	6.556
UTSUNOMIYA	237.868	260.265	9.416	300.227	15.354
MAEBASHI	122.638	138.993	13.336	157.499	13.314
TAKASAKI	165.718	182.407	10.071	204.868	12.314
KIRYU	73.060	81.838	11.984	89.413	9.256
KUMAGAYA	127.917	138.292	8.111	154.319	11.589
CHIBA	247.660	300.318	21.262	393.921	31.168
TOKYO	6136.391	7692.050	25.351	8726.403	13.447
YOKOHAMA	899.511	1253.416	39.344	1572.277	25.439
HIRATSUKA	66.519	89.448	34.470	111.650	24.821
ODAWARA	106.721	129.642	21.477	144.337	11.335
NIIGATA	293.399	323.049	10.106	356.329	10.302
NAGAOKA	105.305	112.037	6.393	122.514	9.351

Table 5 (continued)

	EMPLOYMENT (1000'S)				
	1960	1965	% CHANGE 1960-1965	1970	% CHANGE 1965-1970
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TOYAMA	240.429	249.974	3.970	268.957	7.594
TAKAOKA	183.655	189.961	3.434	203.247	6.994
KANAZAWA	235.953	260.280	10.310	284.572	9.333
FUKUI	253.626	265.653	4.742	281.020	5.785
KOFU	169.309	178.831	5.624	195.194	9.150
NAGANO	188.750	202.880	7.486	222.949	9.892
MATSUMOTO	141.286	151.155	6.985	166.824	10.366
GIFU	310.384	358.307	15.440	403.231	12.536
SHIZUOKA	366.115	416.726	13.824	476.629	14.375
HAMAMATSU	366.424	396.150	8.112	449.537	13.476
NUMAZU	149.384	175.889	17.743	209.623	19.179
NAGOYA	1646.750	1951.907	18.531	2190.774	12.238
TOYOHASHI	191.063	217.235	13.693	242.621	11.686
TOYOTA	158.259	194.753	23.060	245.133	25.869
TSU	139.990	147.618	5.449	159.964	8.363
YOKKAICHI	195.477	216.796	10.906	237.783	9.681
ISE	81.899	83.324	1.740	89.332	7.210
OTSU	148.858	164.039	10.198	188.167	14.709
KYOTO	685.412	802.872	17.157	885.094	10.241
OSAKA	3044.325	3993.053	31.164	4569.322	14.432
KOBE	764.895	738.419	-3.481	823.438	11.514
HIMEJI	312.019	350.288	12.265	391.156	11.668
NARA	90.552	107.352	18.553	133.230	24.106
WAKAYAMA	222.051	254.465	14.598	280.720	10.316
TOTTORI	96.652	96.014	-0.660	106.467	10.887
YONAGO	89.403	93.187	4.233	101.445	8.862
MATSUE	111.494	111.292	-0.161	122.424	10.003
OKAYAMA	278.889	306.449	9.882	342.278	11.692
KURASHIKI	174.078	188.859	8.491	226.730	20.053
HIROSHIMA	374.063	443.508	18.565	523.443	18.023
FUKUYAMA	239.162	252.123	5.419	290.370	15.170
SHIMANOSEKI	143.161	146.867	3.986	156.874	5.379
UBE	101.387	99.369	-1.990	105.615	5.286
YAMAGUCHI	56.758	56.933	0.308	61.206	7.505
IWAKUNI	78.356	79.357	1.278	86.833	9.421
TOKUSHIMA	196.041	203.671	3.892	225.576	10.755
TAKAMATSU	277.099	292.366	5.510	321.419	9.937
MATSUYAMA	235.399	177.859	-24.444	204.981	15.249
IMABARI	75.018	80.564	7.393	89.132	10.635
NIIHAMA	79.526	84.004	5.631	92.757	10.420
KOCHI	152.919	168.175	9.977	189.711	12.806
KITAKYUSHU	609.503	631.214	3.582	668.908	5.972
FUKUOKA	451.869	527.946	16.836	624.000	18.194
OMUTA	108.231	111.914	3.403	115.183	2.921
KURUME	207.301	208.556	0.605	223.054	6.952
SAGA	113.040	114.632	1.408	122.993	7.294
NAGASAKI	199.010	213.365	7.213	235.702	10.469
SASEBO	119.438	115.478	-3.316	125.404	8.596
KUMAMOTO	188.361	210.494	11.750	239.439	13.751
YATSUSHIRO	63.585	62.071	-2.381	66.065	6.435
OITA	167.593	187.561	11.915	213.011	13.569
MIYAZAKI	80.505	91.509	13.689	109.042	19.160
NOBEOKA	60.731	62.594	3.068	69.613	11.214
KAGOSHIMA	169.996	186.840	9.908	211.329	13.107

The outer suburbs of Osaka also grew more rapidly in the later periods; see, for instance, the data for Himeji and Wakayama. The growth rates of Osaka's outer suburbs were not as great as those of Tokyo, however. We discuss this further in Section 3.3.

The slow-growing cities on the periphery of the urban system declined relative to the fast-growing cities between 1950 and 1970. In some cases, growth rates went from positive to negative. For instance, Yatsushiro grew by 6.5 percent during the first period but declined at a rate of 3.3 percent in the last. Ube grew by 6.1 percent in 1950-1955 but declined by 4.0 percent in 1965-1970; however, the decline of Ube was 9.1 percent during 1960-1965.

Examining the patterns of 1960-1970 employment growth in Table 5, one also finds that many fast-growing regions expanded less rapidly during 1965-1970 than during 1960-1965. Sapporo added 33.4 percent to its work rolls in the earlier and 23.1 percent in the later period. Tokyo's 25.4 percent increase was cut to 13.4 percent and Osaka went from 31.2 percent to 14.4 percent. On the other hand, fast-growing suburbs such as Chiba and such independent centers as Sendai and Fukuoka increased their growth rates in the late 1960s. For slow-growing regions, the employment picture brightened somewhat during the 1965-1970 period. In general, negative growth rates from 1960 to 1965 were replaced by positive growth rates from 1965 to 1970 and, overall, there were greater positive rates of increase. However, the slower expansion in 1965-1970 of the fast-growing regions was still greater than the more rapid additions to employment of the slower-growing, peripheral regions.

3.3. Metropolitan Spatial Structure

Table 6 indicates the relationship between the 80 central cities and the 823 satellite cities, towns, and villages for 1950-1970 on a place of residence basis. Central city population was 55.5 percent of the total REC population in 1950 and rose to 58.5 percent in 1960. Therefore there was an increasing centralization of metropolitan regions in Japan during that decade.

Table 6

Central Cities as a Percent of Total REC on the
Basis of Place of Residence, 1950-1970

	<u>1950</u>	<u>1960</u>	<u>1970</u>
Population	55.0	58.5	54.8
Total Employment	NA	58.0	54.3
Primary Employment	NA	30.1	29.6
Secondary Employment	NA	61.1	52.1
Manufacturing Employment	NA	61.4	51.0
Wholesale and Retail Employment	NA	69.7	63.2
Services Employment	NA	65.6	59.4
Government Employment	NA	60.7	55.1

Between 1960 and 1970 there was some decentralization: 54.8 percent of the population in the RECs lived in central cities in 1970. Thus there was some metropolitan decentralization, although not to the extent previously noted by Berry [1973a, 1973b] and Hall [1973a, 1973b] for the United States and the United Kingdom respectively. The extent of decentralization in these countries was massive as we shall discuss in Section 5. Although no employment data are available for 1950, the percentage of employees living in central cities declined from 58.0 percent to 54.3 percent between 1960 and 1970.

Concerning metropolitan decentralization, wholesale and retail employees were the least decentralized in 1970 with 63.2 percent of the employees in that category living in central cities; comparable figures for primary, manufacturing, services, and government were 51.1 percent, 51.0 percent, 59.4 percent, and 55.1 percent respectively. Table 6 shows that the growth in the central city employment was slower than in the suburbs across industrial classes: the growth rate was more than twice as much in the suburbs as in the central cities; in manufacturing, central cities employment grew by 17.3 percent compared to 79.1 percent in the suburbs (see Table 8).

Distribution of employment in central cities and suburbs for 1960 and 1970 is shown in Table 7. One immediately sees the relative shift of secondary industry to the suburbs over 1960s. In 1960, central cities had 37.9 percent of all of their employees in secondary industry, but had only 36.7 percent in 1970. During that decade, the share of secondary employment in the suburbs rose from 33.3 percent to 40.0 percent. Therefore there was a relative suburbanization of manufacturing employees in that the suburbs were more concentrated in secondary employees than were the central cities by 1970. Looking at other employment categories, the central cities were more concentrated in wholesale and retail employment, services employment, "other" tertiary employment, and government employment than the suburbs. On the other hand, the suburbs continued to be more concentrated in primary employees as small-scale farming continued there.

Table 7

Percent Distribution of Employment by Industrial Class
for Central Cities and Suburbs, 1960 and 1970
(percent)

	<u>Central Cities</u>			<u>Suburbs</u>		
	<u>1960</u>	<u>1970</u>	<u>Percent Change 1960-1970</u>	<u>1960</u>	<u>1970</u>	<u>Percent Change 1960-1970</u>
Primary Employment	9.585	5.319	-44.512	30.714	15.017	-51.106
Secondary Employment	37.865	36.652	-3.205	33.305	40.016	20.148
Wholesale and Retail Employment	22.790	25.771	13.083	13.676	17.872	30.678
Services Employment	15.601	17.061	9.361	11.323	13.877	22.561
Other Tertiary Employment	10.591	11.671	10.193	7.786	9.807	25.949
Government Employment	3.567	3.526	-1.155	3.195	3.411	6.749

Table 8 shows the population and employment growth rates for central cities and suburban areas for 1950-1970. In the 1950s, population grew at a rate of 32.9 percent in central cities compared to only 15.2 percent in the suburbs. In the 1960s, the growth rates were reversed: central cities grew at 15.0 percent and the suburbs at 33.8 percent. Table 8 also reveals the much more substantial growth of the suburbs in employment categories for the period 1960-1970 than the growth of the central cities.

The data exhibited thus far are on a place of residence basis. In Table 9 we show employment patterns by place of work. There we see that the concentration in central cities by place of work is higher than by place of residence. For instance, manufacturing employment by place of work registers an 88.8 percent ratio of central city to REC whereas on a place of residence basis (Table 6) it is only 51.0 percent. Similarly wholesale and retail employment and services have 79.7 and 60.0 percent respectively of employment compared to place of residence figures of 63.2 percent and 59.4 percent respectively. Thus services are more evenly distributed with population, consistent with a priori expectations; wholesale and retail trade are much more highly centralized.

The suburbanization of the major metropolitan regions is shown in Table 10 where we display the spatial patterns of growth for Tokyo, Osaka and Nagoya metropolitan areas. Within the Tokyo SCA, the Tokyo REC's growth rate declines in each five-year period from 23.7 percent (1950-1955) to 13.7 percent (1965-1970). Tokyo's major suburbs--Yokohama, Chiba and Hiratsuka--showed increasing growth in later years and by 1970, were growing faster than Tokyo. Kumagaya, Odawara, and Numazu, which were further away from central Tokyo, had increasing growth rates but which were absolutely lower than the inner RECs. For Osaka, higher growth rates are recorded in later periods for Nara (which grew 1.9 percent during 1955-1960 and 21.3 percent in 1965-1970) and Otsu. Even though the Osaka REC's growth rate fell over time, it was still higher than all but Nara's in the last period of this study.

Table 8

GROWTH RATES OF RECs AND COMPONENTS, 1950-60 and 1960-70

	<u>1950 - 1960</u>		<u>1960 - 1970</u>	
	<u>CENTRAL CITIES</u>	<u>SUBURBS</u>	<u>CENTRAL CITIES</u>	<u>SUBURBS</u>
POPULATION	32.9	15.2	15.0	33.8
TOTAL EMPLOYMENT	NA	NA	24.6	44.9
PRIMARY EMPLOYMENT	NA	NA	-30.9	-29.2
SECONDARY EMPLOYMENT	NA	NA	20.6	74.1
MANUFACTURING EMPLOYMENT	NA	NA	17.3	79.1
WHOLESALE & RETAIL EMPLOYMENT	NA	NA	40.8	89.3
SERVICES EMPLOYMENT	NA	NA	36.2	77.6
GOVERNMENT EMPLOYMENT	NA	NA	23.1	54.7

Table 9

Employment by Place of Work, 1970

	<u>Central City as a Percent of REC</u>
Manufacturing employment	88.8
Wholesale and retail employment	79.7
Services employment	60.0

Table 10

Growth Rates of RECs within Tokyo,
Osaka and Nagoya SCAs, 1950-1970
(percent)

	<u>1950-1955</u>	<u>1955-1960</u>	<u>1960-1965</u>	<u>1965-1970</u>
<u>Tokyo SCA</u>				
Tokyo	23.7	19.5	18.9	13.7
Yokohama	17.1	16.1	28.4	24.6
Chiba	6.2	8.5	19.5	31.5
Kumagaya	1.6	-1.0	4.1	7.2
Hiratsuka	13.3	6.8	22.9	22.5
Odawara	8.6	6.9	12.8	7.7
Numazu	8.4	8.5	13.3	12.4
<u>Osaka SCA</u>				
Osaka	20.4	17.7	22.0	14.8
Kyoto	9.2	5.5	8.9	10.0
Kobe	16.7	9.6	10.2	9.6
Himeji	2.4	3.7	7.4	6.8
Wakayama	7.3	3.0	8.9	7.3
Nara	6.3	1.9	14.5	21.3
Otsu	3.4	2.7	6.6	10.5
<u>Nagoya SCA</u>				
Nagoya	11.5	19.0	15.7	9.1
Toyota	18.6	9.7	17.1	22.1
Gifu	10.0	6.2	10.8	9.0
Tsu	3.8	-0.5	2.8	4.3
Yokkaichi	5.4	5.3	9.6	7.6

Tables 6 through 10 clearly show the beginning of the suburbanization process which was to continue into the 1970s as we indicate in Glickman [1977a]. Population began to shift towards the suburbs in the 1960, although employment continued to be highly centralized on a place of work basis. Suburbanization, however, was concentrated in the larger metropolitan regions such as Tokyo, Osaka, and Nagoya. The smaller and more peripherally-located RECs exhibited centralization as migrants were drawn from nearby small towns to REC central cities. The central cities grew faster than the component suburban cities in those outlying RECs.

3.4. Industrial Distribution and Growth by Size of Region

How has industrial employment structure varied according to region size? How has regional growth varied with the size of each region? We answer these questions in this section through Tables 11 and 12.

In Table 11 we present data by size of region on the industrial structure for 1970. What is striking here is the remarkable stability of industrial structure according to city size. For instance, secondary industry had 38.2 percent of all employees for all cities. But the range of concentration in the different size classes is small with the exception of the 600,000-700,000 and 700,000-800,000 groups. All other industrial sectors, save primary industry (which falls as a percentage of total employment as size of city increases), show the same sort of stability.

Table 12 shows rates of growth among the regions by size of region for population and for the various employment categories. Here, there is the phenomenon of considerably faster growth for both population and employment among the larger RECs. For the smallest category, less than 200,000 people in a REC, population grew by only 1.8 percent between 1960 and 1970. For regions larger than 700,000, there were significantly higher growth rates; the ten REC comprising the size class 1 million or greater grew 33.8 percent between 1960 and 1970.

Table 11

INDUSTRIAL STRUCTURE OF RECS BY SIZE CLASS OF REGION

	0-200,000	200,000-300,000	300,000-400,000	400,000-500,000
% PRIMARY EMPLOYMENT	20.115	17.186	20.452	19.060
% SECONDARY EMPLOYMENT	33.880	30.224	33.317	33.075
% WHOLESALE & RETAIL EMPLOYMENT	18.492	21.878	18.678	19.231
% SERVICES EMPLOYMENT	15.300	16.399	14.859	15.273
% OTHER TERTIARY EMPLOYMENT	8.667	9.113	9.142	9.563
% GOVERNMENT EMPLOYMENT	3.545	5.200	3.553	3.799
TOTAL	100.000	100.000	100.000	100.000
	500,000-600,000	600,000-700,000	700,000-800,000	800,000-900,000
% PRIMARY EMPLOYMENT	15.801	20.248	13.122	17.436
% SECONDARY EMPLOYMENT	33.099	28.428	44.618	39.794
% WHOLESALE & RETAIL EMPLOYMENT	21.258	21.009	18.217	17.452
% SERVICES EMPLOYMENT	15.860	15.875	12.524	13.139
% OTHER TERTIARY EMPLOYMENT	9.979	10.683	8.590	8.634
% GOVERNMENT EMPLOYMENT	4.003	3.756	2.929	3.344
TOTAL	100.000	100.000	100.000	100.000
	900,000-1,000,000	1,000,000 +	ALL CITIES	
% PRIMARY EMPLOYMENT	14.939	4.280	9.747	
% SECONDARY EMPLOYMENT	31.489	41.275	36.188	
% WHOLESALE & RETAIL EMPLOYMENT	23.037	23.651	22.164	
% SERVICES EMPLOYMENT	15.664	15.881	15.607	
% OTHER TERTIARY EMPLOYMENT	10.944	11.694	10.820	
% GOVERNMENT EMPLOYMENT	3.926	3.219	3.474	
TOTAL	100.000	100.000	100.000	

Table 12

PERCENT CHANGE IN POPULATION AND EMPLOYMENT BY SIZE CLASS OF REGION, 1960-1970

	0-200,000	200,000-300,000	300,000-400,000	400,000-500,000
POPULATION	1.774	9.132	6.601	11.473
EMPLOYMENT	13.650	22.232	21.232	16.347
PRIMARY EMPLOYMENT	-28.192	-24.669	-27.545	-30.104
SECONDARY EMPLOYMENT	33.812	33.897	50.415	44.353
WHOLESALE & RETAIL EMPLOYMENT	31.631	53.795	45.411	44.051
SERVICES EMPLOYMENT	36.809	42.990	50.666	53.949
OTHER TERTIARY EMPLOYMENT	34.985	27.514	39.858	0.172
GOVERNMENT EMPLOYMENT	17.977	66.491	23.965	28.730
	500,000-600,000	600,000-700,000	700,000-800,000	800,000-900,000
POPULATION	12.822	8.021	17.600	30.087
EMPLOYMENT	23.336	20.090	27.633	37.352
PRIMARY EMPLOYMENT	-31.099	-30.145	-30.202	-31.842
SECONDARY EMPLOYMENT	42.381	43.568	46.902	81.422
WHOLESALE & RETAIL EMPLOYMENT	44.253	56.808	47.318	71.831
SERVICES EMPLOYMENT	51.506	56.361	50.271	78.393
OTHER TERTIARY EMPLOYMENT	51.865	29.367	42.538	66.099
GOVERNMENT EMPLOYMENT	26.195	40.147	19.524	36.599
	900,000-1,000,000	1,000,000 +	ALL CITIES	
POPULATION	18.624	33.792	24.037	
EMPLOYMENT	32.784	41.439	33.077	
PRIMARY EMPLOYMENT	-23.629	-32.583	-29.684	
SECONDARY EMPLOYMENT	48.008	39.148	41.350	
WHOLESALE & RETAIL EMPLOYMENT	61.775	59.614	55.507	
SERVICES EMPLOYMENT	56.539	49.888	50.436	
OTHER TERTIARY EMPLOYMENT	58.242	68.158	52.935	
GOVERNMENT EMPLOYMENT	14.230	38.543	35.506	

The range of growth rates for cities of 700,000 or larger was between 17.6 percent and 33.8 percent, whereas for cities of less than 700,000 the growth rates were between 1.7 percent and 12.8 percent. For total employment, the growth rates were between 27 percent and 41 percent for cities above 700,000 compared to only 16 to 23 percent for the smaller regions.

The relationship between regions size and region growth is given in a regression equation in Glickman [1977a] in which the region's population is a good predictor of a region's growth in the 1960s; see also Figure 1 of Glickman [1977a]. We see in Glickman [1977a] that the relationship between region size and region population growth changes in the 1970s as the large regions began to lose their preeminence; after 1970, medium size regions grew quickly relative to other regions.

3.5. Major Regions

We have aggregated the RECs into nine major regions (see Table 13) according to the regions defined by the Japan Economic Planning Agency. The nine regions are: Hokkaido, Tohoku, Kanto Tokai, Hokuriku, Kinki, Chugoku, Shikoku, Kyushu.¹¹ In terms of population, Kanto and Kinki were the largest and Shikoku and Hokkaido were the smallest. Interestingly, the large regions grew the fastest, although Hokkaido also grew quickly. Kanto and Kinki (the regions surrounding Tokyo and Osaka respectively)

¹¹ The regions were defined as follows:

- 1) Hokkaido: Hokkaido prefecture.
- 2) Tohoku: Aomori, Iwate, Miyagi, Akita, Yamagata and Fukushima prefectures.
- 3) Kanto: Ibaragi, Tochigi, Gumma, Saitama, Chiba, Tokyo, Kanagawa and Yamanashi prefectures.
- 4) Tokai: Gifu, Shizuoka, Aichi, and Mie prefectures.
- 5) Hokuriku: Toyama, Ishikawa, Fukui, Nagano and Niigata prefectures
- 6) Kinki: Shiga, Kyoto, Osaka, Hyogo, Nara and Wakayama prefectures.
- 7) Chugoku: Tottori, Shimane, Okayama, Hiroshima, Yamaguchi and Tokushima prefectures
- 8) Shikoku: Kagawa, Ehime and Kochi prefectures.
- 9) Kyushu: Fukuoka, Saga, Nagasaki, Kumamoto, Oita, Miyazaki, and Kagoshima prefectures.

Table 13
Levels and Growth Rates of Population and Employment by
Industrial Class in Nine Japanese Major Regions, 1950-1975

	1950	1960	% CHANGE 1950-1960	1970	% CHANGE 1960-1970
HOKKAIDO					
POPULATION (1000'S)	1185,933	1563,236	31.819	2079,833	33.042
TOTAL EMPLOYMENT (1000'S)		637,691		957,912	50.216
% PRIMARY EMPLOYMENT		10.286		4.787	-53.464
% SECONDARY EMPLOYMENT		29.277		28.092	-4.047
% WHOLESALE & RETAIL EMPLOYMENT		22.931		26,992	17.709
% SERVICES EMPLOYMENT		16.356		19,708	20.491
% OTHER TERTIARY EMPLOYMENT		14.375		14,833	3.186
% GOVERNMENT EMPLOYMENT		6.775		5,589	-17.505
TOHOKU					
POPULATION (1000'S)	2385,451	2578,288	8.109	2869,240	11.259
TOTAL EMPLOYMENT (1000'S)		1144,248		1421,612	24.240
% PRIMARY EMPLOYMENT		35.605		21,426	-39.624
% SECONDARY EMPLOYMENT		20.016		25,239	26.096
% WHOLESALE & RETAIL EMPLOYMENT		17.143		21,393	24.790
% SERVICES EMPLOYMENT		13.328		16,730	25.522
% OTHER TERTIARY EMPLOYMENT		8.839		10,450	18.226
% GOVERNMENT EMPLOYMENT		5.069		4,763	-6.048
KANTO					
POPULATION (1000'S)	13608,624	18669,214	37.187	25228,235	35.133
TOTAL EMPLOYMENT (1000'S)		8668,191		12419,931	43.282
% PRIMARY EMPLOYMENT		13.052		6,350	-51.345
% SECONDARY EMPLOYMENT		38.659		40,028	3.542
% WHOLESALE & RETAIL EMPLOYMENT		20.370		22,764	11.845
% SERVICES EMPLOYMENT		14.534		16,300	9.145
% OTHER TERTIARY EMPLOYMENT		9.449		11,157	18.076
% GOVERNMENT EMPLOYMENT		3.536		3,380	-4.408

Table 13 (continued)

TOKAI					
	1950	1960	% CHANGE 1950-1960	1970	% CHANGE 1960-1970
POPULATION (1000'S)	5938.683	7298.250	22.893	8715.443	19.418
TOTAL EMPLOYMENT (1000'S)		3605.745		4704.627	30.476
% PRIMARY EMPLOYMENT		21.687		11.762	-45.766
% SECONDARY EMPLOYMENT		40.575		43.820	7.997
% WHOLESALE & RETAIL EMPLOYMENT		16.585		19.906	20.026
% SERVICES EMPLOYMENT		10.561		12.968	22.796
% OTHER TERTIARY EMPLOYMENT		7.530		9.056	13.488
% GOVERNMENT EMPLOYMENT		2.612		2.487	-4.773
HOKURIKU					
	1950	1960	% CHANGE 1950-1960	1970	% CHANGE 1960-1970
POPULATION (1000'S)	3127.476	3316.942	6.058	3518.954	6.090
TOTAL EMPLOYMENT (1000'S)		1642.403		1906.412	16.075
% PRIMARY EMPLOYMENT		34.663		21.004	-39.405
% SECONDARY EMPLOYMENT		27.293		32.275	18.256
% WHOLESALE & RETAIL EMPLOYMENT		16.081		19.649	22.185
% SERVICES EMPLOYMENT		11.225		14.607	30.128
% OTHER TERTIARY EMPLOYMENT		7.767		9.284	19.536
% GOVERNMENT EMPLOYMENT		2.971		3.181	7.048
KINKI					
	1950	1960	% CHANGE 1950-1960	1970	% CHANGE 1960-1970
POPULATION (1000'S)	8777.205	11405.593	29.946	15032.177	31.797
TOTAL EMPLOYMENT (1000'S)		5268.112		7271.129	38.022
% PRIMARY EMPLOYMENT		9.612		4.823	-49.026
% SECONDARY EMPLOYMENT		43.530		43.284	-0.680
% WHOLESALE & RETAIL EMPLOYMENT		20.289		23.165	14.177
% SERVICES EMPLOYMENT		15.034		14.657	-2.507
% OTHER TERTIARY EMPLOYMENT		3.727		11.298	29.463
% GOVERNMENT EMPLOYMENT		2.759		2.774	0.536

Table 13 (continued)

	1950	1960	% CHANGE 1950-1960	1970	% CHANGE 1960-1970
CHUGOKU					
	3659.219	4059.417	10.937	4520.815	11.366
POPULATION (1000'S)		1939.444		2349.261	21.131
TOTAL EMPLOYMENT (1000'S)		29.767		16.716	-43.843
% PRIMARY EMPLOYMENT		29.177		34.207	17.239
% SECONDARY EMPLOYMENT		16.023		19.710	23.015
% WHOLESALE & RETAIL EMPLOYMENT		12.291		15.330	24.723
% SERVICES EMPLOYMENT		9.081		10.290	13.306
% OTHER TERTIARY EMPLOYMENT		3.662		3.748	2.347
% GOVERNMENT EMPLOYMENT					
SHIKOKU					
	1545.984	1630.284	5.453	1757.684	7.815
POPULATION (1000'S)		819.561		898.000	9.517
TOTAL EMPLOYMENT (1000'S)		30.038		18.928	-36.965
% PRIMARY EMPLOYMENT		23.377		30.264	29.457
% SECONDARY EMPLOYMENT		14.483		20.305	40.192
% WHOLESALE & RETAIL EMPLOYMENT		11.906		16.668	39.994
% SERVICES EMPLOYMENT		17.374		10.168	-41.478
% OTHER TERTIARY EMPLOYMENT		2.821		3.668	30.011
% GOVERNMENT EMPLOYMENT					
KYUSHU					
	5263.137	6129.617	16.463	6546.195	6.796
POPULATION (1000'S)		2539.163		3023.743	19.084
TOTAL EMPLOYMENT (1000'S)		22.041		13.253	-39.672
% PRIMARY EMPLOYMENT		28.020		28.070	0.180
% SECONDARY EMPLOYMENT		20.208		23.601	16.791
% WHOLESALE & RETAIL EMPLOYMENT		15.037		17.859	18.766
% SERVICES EMPLOYMENT		10.526		11.502	9.272
% OTHER TERTIARY EMPLOYMENT		4.169		5.715	37.103
% GOVERNMENT EMPLOYMENT					

had population increases of 34.5 and 30.2 percent between 1960 and 1970; Hokkaido grew by 33.0 percent. The slowest growing regions were at the periphery of the urban system: Hokuriku (6.1 percent growth) and Kyushu (6.8 percent growth). Between 1950 and 1960, Hokkaido, Kanto and Kinki were also the fastest-growing regions; the growth rates of Hokkaido and Kinki accelerated in the 1960-1970 period, although Kanto's declined slightly. Overall, there is stability of the growth rates in interdecennial periods, and there is a strong tendency towards the system's centralization. Thus the large major regions were getting even larger, the smaller regions lagging still further.

It is important to note that both Kanto and Kinki were more heavily concentrated in secondary industry than the other major regions. Tokai was also predominantly manufacturing and "other" secondary employment. The lowest concentration in secondary industry was in Tohoku and Kyushu. Kyushu and Hokkaido had the highest concentration in government employment whereas Tokai and Kinki had the lowest. The tendency for manufacturing-based major regions to grow quickly is in contradistinction to the experience of the United States and the United Kingdom where in the 1950s and 1960s service-based cities grew the most rapidly. However, nonmanufacturing industrial development was also important in the regional growth process in Japan as we see in Section 4.3.

In Table 14 we present another aggregation of the RECs into the Tokaido and non-Tokaido¹² regions. We see that the Tokaido region was growing faster than the non-Tokaido area with respect to employment and population in both decades. This is another way of showing the relative centralization of the urban system. We also see a large difference in the proportion of employment in secondary industry (41.7 percent in Tokaido as opposed to only 30.0 percent in non-Tokaido area). On the other hand, there is relatively more primary and government employment in the non-Tokaido region.

¹²The Tokaido region is the summation of the RECs of the Kanto, Tokai and Kinki major regions. The non-Tokaido major region consists of the RECs in all other prefectures.

Table 14
Levels and Growth Rates of Population and Employment
by Industrial Class in the Tokaido Region and Non-Tokaido Areas, 1950-1970

TOKAIDO -----					
	1950 -----	1960 -----	% CHANGE 1950-1960 -----	1970 -----	% CHANGE 1960-1970 -----
POPULATION (1000'S)	28324.512	37373.057	31.946	48975.855	31.046
TOTAL EMPLOYMENT (1000'S)		17542.048		24395.687	39.070
% PRIMARY EMPLOYMENT		13.794		6.939	-49.697
% SECONDARY EMPLOYMENT		40.531		41.730	2.958
% WHOLESALE & RETAIL EMPLOYMENT		19.568		22.343	14.181
% SERVICES EMPLOYMENT		14.065		15.168	7.841
% OTHER TERTIARY EMPLOYMENT		8.930		10.794	20.870
% GOVERNMENT EMPLOYMENT		3.112		3.027	-2.747
NON-TOKAIDO -----					
	1950 -----	1960 -----	% CHANGE 1950-1960 -----	1970 -----	% CHANGE 1960-1970 -----
POPULATION (1000'S)	17167.200	19278.434	12.298	21292.721	10.448
TOTAL EMPLOYMENT (1000'S)		8722.910		10556.940	21.025
% PRIMARY EMPLOYMENT		27.807		16.238	-41.603
% SECONDARY EMPLOYMENT		26.746		30.002	12.177
% WHOLESALE & RETAIL EMPLOYMENT		17.759		21.751	22.479
% SERVICES EMPLOYMENT		13.287		16.623	25.112
% OTHER TERTIARY EMPLOYMENT		10.389		10.879	4.714
% GOVERNMENT EMPLOYMENT		4.013		4.506	12.295

4. ADDITIONAL ANALYSIS OF GROWTH PATTERNS OF JAPANESE REGIONAL ECONOMIC CLUSTERS

4.1. Introduction

In this section we further discuss the growth patterns which occurred within the Japanese urban system in the 1950s and 1960s. In Section 4.2 and Appendix 4 we present some shift-share analysis of the growth of population and employment. Regression analysis of changes in these variables are given in Section 4.3.

4.2. Shift-Share Analysis

Tables 15-17 summarize a shift-share analysis of the Japanese RECs. Shift-share indicates the growth of a region which would have occurred if the region had grown at the same rate as all RECs. One can then calculate the "expected" growth of a region assuming that it grew at the all-REC rate as in column 3 of Tables 15-17. Therefore the expected growth is compared to the actual growth which is given in column 2. Column 4 shows the absolute difference between the actual and expected growth for a given region.

In Table 15 we see that Sapporo grew from 626.4 thousand population in 1950 to 878.2 thousand in 1960. The expected level of population for 1960, based on the growth of all Japanese RECs, was only 780.0 thousand. As a result, the "shift factor" given in column 4 is 98.17 thousand, the difference between the actual and expected (878.2 thousand minus 780.0 thousand). Hakodate, on the other hand, grew only to 312.5 thousand in 1960 rather than the "expected" 367.0; the result is a -54.55 thousand shift factor for that city since it did not grow as fast as the national rate.

The shift index given in column 5 is the percent change in a REC's share of all the REC population or for total REC employment. Thus if the REC had 2.0 percent of the total in 1960 and

Table 15

SHIFT-SHARE ANALYSIS OF POPULATION, 1950 - 1960

	1. ACTUAL 1950 -----	2. ACTUAL 1960 -----	3. EXPECTED 1960 -----	4. SHIFT FACTOR (2-3) -----	5. SHIFT INDEX -----	
1.	SAPPORO	626.4	878.2	780.0	98.17	1.13
2.	HAKODATE	294.7	312.5	367.0	-54.55	0.85
3.	MURORAN	154.8	201.2	192.7	8.49	1.04
4.	KUSHIRO	110.1	171.4	137.1	34.32	1.25
5.	MORIONA	141.8	171.8	176.6	-4.75	0.97
6.	SENDAI	704.6	794.7	877.4	-82.69	0.91
7.	ISHIMACHI	126.4	162.6	157.5	-24.85	0.84
8.	AKITA	338.6	361.1	421.7	-50.52	0.86
9.	YAMAGATA	360.7	303.1	474.1	-91.01	0.81
10.	FUKUSHIMA	284.2	307.0	353.9	-46.91	0.87
11.	AIZUWAKAMATSU	113.6	119.3	141.4	-22.18	0.84
12.	KORIYAMA	295.6	309.2	366.1	-58.84	0.84
13.	MITO	326.9	358.7	407.1	-48.42	0.80
14.	HITACHI	269.1	318.1	335.2	-17.03	0.95
15.	UTSUNOMIYA	508.9	518.7	633.8	-115.03	0.82
16.	MAEBASHI	253.2	265.8	315.3	-49.47	0.84
17.	TAKASAKI	335.3	353.3	417.5	-64.27	0.85
18.	KIRYU	146.2	149.4	182.1	-32.67	0.82
19.	KUMAGAYA	258.1	259.6	321.4	-61.81	0.81
20.	CHIBA	450.8	519.6	561.4	-41.77	0.93
21.	TOKYO	6857.3	13099.3	11030.1	2069.21	1.19
22.	YOKOHAMA	1526.8	2076.8	1901.4	175.48	1.09
23.	HIRATSUKA	128.7	155.7	160.3	-4.53	0.97
24.	ODAWARA	201.2	253.6	250.5	-16.94	0.93
25.	NIIGATA	588.3	654.4	732.6	-98.20	0.87
26.	NAGAOKA	195.0	212.8	242.9	-30.11	0.88
27.	TOYAMA	440.1	477.8	548.1	-70.31	0.87
28.	TAKAOKA	363.0	367.5	452.1	-84.52	0.81
29.	KANAZAWA	438.5	402.9	546.0	-63.17	0.88
30.	FUKUI	471.6	465.1	587.3	-102.14	0.83
31.	KOFU	346.1	360.4	431.0	-70.55	0.84
32.	NAGANO	363.1	302.4	452.1	-69.71	0.85
33.	MATSUMOTO	267.9	274.0	333.6	-59.59	0.82
34.	GIFU	531.3	620.7	661.7	-40.98	0.94
35.	SHIZUOKA	659.5	793.8	821.3	-27.46	0.97
36.	HAMAMATSU	621.4	745.7	773.8	-30.10	0.96
37.	NUMAZU	281.2	300.9	350.2	-19.35	0.94
38.	NAGOYA	2461.9	3267.6	3065.9	201.76	1.07
39.	TOYOHASHI	346.8	381.0	431.9	-50.89	0.88
40.	TOYOTA	239.1	311.1	297.8	13.33	1.04
41.	TSU	281.9	291.0	351.1	-60.05	0.83
42.	YOKKAICHI	346.1	304.3	431.0	-46.69	0.69
43.	ISE	169.3	174.0	210.8	-36.84	0.63
44.	OTSU	254.7	302.2	354.5	-52.26	0.85
45.	KYOTO	1312.5	1511.1	1634.4	-123.35	0.92

POPULATION AND EMPLOYMENT VALUES IN THOUSANDS

Table 15 (continued)

SHIFT-SHARE ANALYSIS OF POPULATION, 1950 - 1960

		1. ACTUAL 1950	2. ACTUAL 1960	3. EXPECTED 1960	4. SHIFT FACTOR (2-3)	5. SHIFT INDEX
		-----	-----	-----	-----	-----
46.	OSAKA	4784.4	6781.2	5958.1	023.10	1.14
47.	KOBE	1127.3	1441.7	1403.8	37.91	1.03
48.	HIMEJI	642.8	642.2	800.5	-118.30	0.85
49.	NARA	189.3	205.0	235.7	-30.72	0.87
50.	WAKAYAMA	436.3	402.1	543.3	-61.17	0.89
51.	TOTTOKI	201.0	204.8	250.3	-45.57	0.82
52.	YONAGO	173.9	181.6	216.6	-35.03	0.84
53.	MATSUE	218.2	226.2	271.7	-45.52	0.83
54.	OKAYAMA	533.6	578.2	664.5	-86.29	0.87
55.	KURASHIKI	282.4	337.1	351.7	-14.61	0.96
56.	HIROSHIMA	619.9	717.1	771.9	-4.87	0.99
57.	FUKUYAMA	458.2	475.9	570.6	-94.72	0.83
58.	SHIMONOSEKI	293.1	331.9	365.1	-33.18	0.91
59.	UBE	223.4	242.2	278.3	-36.05	0.87
60.	YAMAGUCHI	109.2	117.3	136.0	-18.72	0.86
61.	IWAKUNI	143.9	188.1	179.1	-11.08	0.94
62.	TOKUSHIMA	402.3	429.2	501.0	-71.81	0.86
63.	TAKAMATSU	574.0	579.9	714.9	-134.96	0.81
64.	MATSUYAMA	327.8	388.9	408.2	-39.30	0.90
65.	IMABARI	160.0	184.0	199.3	-35.30	0.82
66.	NIHAMA	189.5	197.3	236.0	-38.75	0.84
67.	KOCHI	294.6	320.2	366.9	-46.64	0.87
68.	KITAKYUSHU	1246.1	1516.5	1551.8	-33.35	0.98
69.	FUKUOKA	866.9	1063.7	1079.6	-15.95	0.99
70.	OMUTA	295.2	307.5	367.6	-60.08	0.84
71.	KURUME	422.8	449.1	526.5	-77.39	0.85
72.	SAGA	252.4	246.9	314.3	-47.38	0.85
73.	NAGASAKI	421.8	506.6	525.3	-18.76	0.96
74.	SASEBO	263.8	297.1	328.6	-31.46	0.90
75.	KUMAMOTO	374.0	453.0	465.7	-12.78	0.97
76.	YATSUSHIRO	141.5	152.1	176.2	-24.09	0.86
77.	OITA	351.1	386.1	437.2	-51.03	0.88
78.	MIYAZAKI	163.5	185.9	203.6	-17.75	0.91
79.	NABEOKA	119.7	128.3	149.1	-10.81	0.93
80.	KAGOSHIMA	344.3	405.0	428.8	-23.82	0.94

REGIONAL TOTALS

1.	HOKKAIDO	1185.9	1583.3	1476.9	86.43	1.06
2.	TOHOKU	2385.5	2576.9	2970.6	-391.75	0.87
3.	KANTO	13608.6	18669.2	16947.0	1722.19	1.10
4.	TOKAI	5933.7	7296.2	7395.5	-97.28	0.99
5.	HOKURIKU	3127.5	3316.9	3894.7	-577.75	0.85
6.	KINKI	8777.2	11405.6	10930.4	475.21	1.04
7.	CHUGOKU	3659.2	4059.4	4556.9	-497.46	0.89
8.	SHIKOKU	1546.0	1600.3	1925.2	-294.95	0.85
9.	KYUSHU	5263.1	6129.6	6554.3	-424.64	0.94

POPULATION AND EMPLOYMENT VALUES IN THOUSANDS

Table 16

SHIFT-SHARE ANALYSIS OF POPULATIONS, 1960 - 1970

	1. ACTUAL 1960 -----	2. ACTUAL 1970 -----	3. EXPECTED 1970 -----	4. SHIFT FACTOR (2-3) -----	5. SHIFT INDEX -----	
1.	SAPPORO	378.2	1108.4	1089.3	210.93	1.19
2.	HAKODATE	312.5	334.1	387.6	-53.53	0.86
3.	MURORAN	201.2	238.1	249.6	-11.45	0.95
4.	KUSHIRO	171.4	207.4	212.6	-5.16	0.98
5.	MORIOKA	171.8	212.7	213.1	-0.45	1.00
6.	SENDAI	794.7	956.9	985.8	-28.89	0.97
7.	ISHIMACHI	132.6	144.8	164.5	-19.69	0.88
8.	AKITA	361.1	303.2	447.9	-64.78	0.86
9.	YAMAGATA	383.1	391.3	475.2	-83.84	0.82
10.	FUKUSHIMA	307.0	327.0	380.8	-53.74	0.86
11.	AIZUWAKAMATSU	119.3	120.6	147.9	-27.28	0.82
12.	KORIYAMA	309.2	352.7	383.6	-50.86	0.87
13.	MITO	358.7	415.5	444.9	-31.42	0.93
14.	HITACHI	318.1	355.2	394.6	-59.45	0.85
15.	UTSUNOMIYA	518.7	583.5	643.4	-59.95	0.91
16.	MAEBASHI	265.8	305.5	329.7	-24.22	0.93
17.	TAKASAKI	353.3	391.4	438.2	-46.79	0.89
18.	KIRYU	149.4	162.3	185.3	-23.02	0.88
19.	KUMAGAYA	259.6	269.5	322.0	-32.45	0.90
20.	CHIBA	519.6	816.0	644.5	171.50	1.27
21.	TOKYO	13099.3	17711.5	16248.0	1463.50	1.09
22.	YOKOHAMA	2076.8	3323.8	2576.0	747.71	1.29
23.	HIRATSUKA	155.7	234.4	193.2	41.26	1.21
24.	ODAWARA	233.6	263.7	289.7	-5.98	0.98
25.	NIIGATA	634.4	691.6	786.9	-95.27	0.88
26.	NAGAOKA	212.8	224.1	263.9	-39.82	0.85
27.	TOYAMA	477.8	493.5	592.6	-99.12	0.83
28.	TAKAOKA	367.5	304.1	455.9	-91.79	0.80
29.	KANAZAWA	482.9	540.3	598.9	-58.67	0.90
30.	FUKUI	485.1	499.6	601.7	-102.15	0.83
31.	KOFU	360.4	377.9	447.1	-69.16	0.85
32.	NAGANO	382.4	411.6	474.3	-62.72	0.87
33.	MATSUMOTO	274.0	294.2	339.9	-45.73	0.87
34.	GIFU	620.7	749.6	769.9	-20.29	0.97
35.	SHIZUOKA	793.8	927.6	984.7	-57.10	0.94
36.	HAMAMATSU	743.7	827.4	922.5	-95.07	0.90
37.	NUMAZU	330.9	421.5	410.4	11.10	1.03
38.	NAGOYA	3267.6	4122.6	4053.1	69.54	1.02
39.	TOYOHASHI	381.0	435.5	472.6	-37.06	0.92
40.	TOYOTA	311.1	445.1	385.9	59.20	1.15
41.	TSU	291.0	312.1	361.0	-48.90	0.86
42.	YOKKAICHI	384.3	453.3	476.7	-23.39	0.95
43.	ISE	174.0	176.6	215.8	-37.22	0.83
44.	OTSU	302.2	356.2	374.9	-18.71	0.95
45.	KYOTO	1511.1	1809.4	1874.3	-64.88	0.97

POPULATION AND EMPLOYMENT VALUES IN THOUSANDS

Table 16 (continued)

SHIFT-SHARE ANALYSIS OF POPULATION, 1960 - 1970

	1. ACTUAL 1960 -----	2. ACTUAL 1970 -----	3. EXPECTED 1970 -----	4. SHIFT FACTOR (2-3) -----	5. SHIFT INDEX -----	
46.	OSAKA	6781.2	9495.2	8411.2	1083.98	1.13
47.	KOBE	1441.7	1741.0	1788.2	-47.24	0.97
48.	HIMEJI	682.2	782.6	846.2	-63.58	0.92
49.	NARA	205.0	284.7	254.3	30.41	1.12
50.	WAKAYAMA	482.1	563.1	598.0	-34.94	0.94
51.	TOTTORI	204.8	199.0	254.0	-54.93	0.78
52.	YONAGO	181.6	186.3	225.2	-38.95	0.83
53.	MATSUE	226.2	247.9	280.5	-52.67	0.81
54.	OKAYAMA	578.2	641.8	717.2	-75.45	0.89
55.	KURASHIKI	337.1	416.5	418.1	0.32	1.00
56.	HIROSHIMA	767.1	1025.8	951.4	74.36	1.08
57.	FUKUYAMA	475.9	544.9	590.3	-45.31	0.92
58.	SHIMONOSEKI	331.9	328.8	411.6	-82.84	0.80
59.	UBE	242.2	211.3	300.4	-89.12	0.70
60.	YAMAGUCHI	117.3	117.1	145.5	-28.37	0.80
61.	IWAKUNI	168.1	174.4	208.5	-34.04	0.84
62.	TOKUSHIMA	429.2	445.0	532.3	-87.34	0.84
63.	TAKAMATSU	579.9	602.9	719.3	-116.35	0.84
64.	MATSUYAMA	368.9	428.5	457.5	-28.99	0.94
65.	IMABARI	164.0	171.2	203.4	-32.17	0.84
66.	NIIHAMA	197.3	193.2	244.7	-51.47	0.79
67.	KOCHI	320.2	361.7	397.2	-35.48	0.91
68.	KITAKYUSHU	1516.5	1501.6	1883.4	-381.87	0.80
69.	FUKUOKA	1063.7	1324.4	1319.3	5.07	1.00
70.	OMUTA	307.5	263.2	381.4	-118.17	0.69
71.	KURUME	449.1	443.4	557.0	-113.60	0.80
72.	SAGA	266.9	266.2	331.1	-74.94	0.77
73.	NAGASAKI	506.6	545.4	628.3	-82.89	0.87
74.	SASEBO	297.1	272.3	368.5	-96.22	0.74
75.	KUMAMOTO	453.0	516.2	561.8	-45.61	0.92
76.	YATSUSHIRO	152.1	140.8	188.7	-47.84	0.75
77.	OITA	386.1	446.9	479.0	-32.08	0.93
78.	MIYAZAKI	185.9	222.6	230.5	-7.92	0.97
79.	NAHEOKA	138.3	143.8	171.5	-27.70	0.84
80.	KAGOSHIMA	405.0	469.3	502.3	-33.00	0.93
REGIONAL TOTALS						
1.	HOKKAIDO	1563.3	2079.8	1939.0	140.78	1.07
2.	TOHOKU	2579.9	2809.2	3198.8	-329.53	0.90
3.	KANTO	18669.2	25228.2	23156.7	2071.52	1.09
4.	TOKAI	7298.2	8715.4	9052.5	-337.07	0.96
5.	HOKURIKU	3316.9	3519.0	4114.2	-595.27	0.86
6.	KINKI	11405.6	15032.2	14147.1	885.05	1.06
7.	CHUGOKU	4059.4	4520.8	5035.2	-514.36	0.90
8.	SHIKOKU	1630.3	1757.7	2022.2	-264.47	0.87
9.	KYUSHU	6129.6	6546.2	7603.0	-1056.79	0.86

POPULATION AND EMPLOYMENT VALUES IN THOUSANDS

Table 17

SHIFT-SHARE ANALYSIS OF POPULATION 1950 - 1970

	1. ACTUAL 1950 -----	2. ACTUAL 1970 -----	3. EXPECTED 1970 -----	4. SHIFT FACTOR (2-3) -----	5. SHIFT INDEX -----	
1.	SAPPORO	626.4	1108.4	967.5	332.69	1.11
2.	HAKODATE	294.7	354.1	455.3	-121.20	0.73
3.	MURORAN	154.8	238.1	239.1	-0.92	1.00
4.	KUSHIRO	110.1	207.4	170.0	37.41	1.22
5.	MORIOKA	141.8	212.7	219.0	-6.35	0.97
6.	SENDAI	704.6	956.9	1088.3	-131.45	0.66
7.	ISHIMACHI	126.4	144.8	195.3	-50.52	0.74
8.	AKITA	338.6	383.2	523.0	-139.84	0.73
9.	YAMAGATA	380.7	391.3	588.1	-196.73	0.67
10.	FUKUSHIMA	284.2	327.0	439.0	-111.93	0.75
11.	AIZUWAKAMATSU	113.6	120.6	175.4	-54.79	0.69
12.	KORIYAMA	295.6	332.7	456.5	-123.84	0.73
13.	MITO	326.9	413.5	505.0	-91.48	0.82
14.	HITACHI	269.1	335.2	415.7	-80.57	0.81
15.	UTSUNOMIYA	508.9	583.5	786.1	-202.63	0.74
16.	MAEBASHI	253.2	305.5	391.1	-65.56	0.73
17.	TAKASAKI	335.3	391.4	517.9	-126.51	0.76
18.	KIRYU	146.2	182.3	225.8	-63.54	0.72
19.	KUMAGAYA	258.1	289.5	393.7	-109.11	0.73
20.	CHIBA	450.8	816.0	696.3	119.69	1.17
21.	TOKYO	8657.3	17711.5	13681.4	4030.88	1.29
22.	YOKOHAMA	1526.8	3323.8	2358.4	965.36	1.41
23.	HIRATSUKA	128.7	234.4	198.8	35.65	1.13
24.	ODAWARA	201.2	283.7	310.7	-26.99	0.91
25.	NIIGATA	588.3	671.6	908.7	-217.98	0.76
26.	NAGAOKA	195.0	224.1	301.3	-77.16	0.74
27.	TOYAMA	440.1	493.5	679.9	-186.33	0.73
28.	TAKAGAKA	363.0	364.1	560.7	-196.62	0.65
29.	KANAZAWA	438.5	540.3	677.3	-137.02	0.80
30.	FUKUI	471.6	499.6	728.4	-228.85	0.69
31.	KOFU	346.1	377.9	534.6	-156.67	0.71
32.	NAGANO	363.1	411.6	560.8	-149.18	0.73
33.	MAIUMOTO	267.9	294.2	413.8	-119.65	0.71
34.	GIFU	531.3	749.6	820.7	-71.12	0.91
35.	SHIZUOKA	659.5	927.6	1018.7	-91.17	0.91
36.	HAMAMATSU	621.4	827.4	959.8	-132.41	0.86
37.	NUMAZU	281.2	421.5	434.4	-12.91	0.97
38.	NAGOYA	2461.9	4122.6	3802.8	319.80	1.08
39.	TOYOHASHI	346.8	435.5	535.7	-100.16	0.81
40.	TOYOTA	239.1	445.1	369.4	75.70	1.21
41.	TSU	281.9	312.1	435.5	-123.39	0.72
42.	YOKKAICHI	346.1	453.3	534.6	-81.30	0.85
43.	ISE	169.3	178.6	261.5	-82.91	0.68
44.	OTSU	284.7	336.2	439.7	-83.53	0.81
45.	KYOTO	1312.5	1849.4	2027.3	-217.88	0.89

POPULATION AND EMPLOYMENT VALUES IN THOUSANDS

Table 17 (continued)

SHIFT-SHARE ANALYSIS OF POPULATION, 1950 - 1970						
	1.	2.	3.	4.	5.	
	ACTUAL	ACTUAL	EXPECTED	SHIFT FACTOR	SHIFT	
	1950	1970	1970	(2-3)	INDEX	
	-----	-----	-----	-----	-----	
46.	OSAKA	4784.4	9495.2	7390.3	2104.93	1.28
47.	KOBE	1127.3	1741.0	1741.2	-0.23	1.00
48.	HIMEJI	642.8	782.6	993.0	-210.32	0.79
49.	NARA	189.3	284.7	292.4	-7.69	0.97
50.	WAKAYAMA	436.3	563.1	673.9	-110.81	0.84
51.	TOTTORI	201.0	199.0	310.5	-111.46	0.64
52.	YONAGO	173.9	186.3	268.7	-82.40	0.69
53.	MATSUE	218.2	227.9	337.0	-109.13	0.68
54.	OKAYAMA	533.6	641.8	824.3	-182.49	0.78
55.	KURASHIKI	282.4	418.5	436.3	-17.81	0.96
56.	HIKUSHIMA	619.9	1025.8	957.5	68.31	1.07
57.	FUKUYAMA	455.2	544.9	707.7	-162.80	0.77
58.	SHIMONOSEKI	293.1	328.8	452.8	-124.00	0.73
59.	UBE	223.4	211.3	345.1	-133.83	0.61
60.	YAMAGUCHI	109.2	117.1	168.7	-51.60	0.69
61.	IWAKUNI	143.9	174.4	222.2	-47.78	0.78
62.	TOKUSHIMA	402.3	445.0	621.4	-176.40	0.72
63.	TAKAMATSU	574.0	602.9	886.7	-283.75	0.68
64.	MATSUYAMA	327.8	428.5	506.3	-77.74	0.85
65.	IMABARI	160.0	171.2	247.2	-75.96	0.69
66.	NIHAMA	189.5	193.2	292.8	-99.53	0.66
67.	KOCHI	294.6	361.7	455.1	-93.34	0.79
68.	KITAKYUSHU	1246.1	1501.6	1924.8	-423.25	0.78
69.	FUKUOKA	866.9	1324.4	1339.1	-14.71	0.99
70.	OMUTA	295.2	263.2	455.9	-192.70	0.58
71.	KURUME	422.8	443.4	653.0	-209.59	0.68
72.	SAGA	252.4	256.2	389.9	-133.71	0.66
73.	NAGASAKI	421.8	545.4	651.6	-106.16	0.84
74.	SASEBO	263.8	272.3	407.5	-135.24	0.67
75.	KUMAMOTO	374.0	516.2	577.7	-61.46	0.89
76.	YATSUSHIRO	141.5	140.8	218.5	-77.72	0.64
77.	OITA	351.1	446.9	542.3	-95.38	0.82
78.	MIYAZAKI	163.5	222.6	252.5	-29.94	0.88
79.	NABEOKA	119.7	143.8	184.9	-41.11	0.78
80.	KAGOSHIMA	344.3	489.3	531.9	-62.54	0.88
REGIONAL TOTALS						
1.	HOKKAIDO	1185.9	2079.8	1831.8	247.98	1.14
2.	TOHOKU	2385.5	2889.2	3684.7	-815.44	0.78
3.	KANTO	13608.6	25228.2	21020.3	4207.65	1.20
4.	TOKAI	5938.7	8715.4	9173.2	-457.74	0.95
5.	HOKURIKU	3127.5	3519.0	4830.9	-1311.90	0.73
6.	KINKI	8777.2	15032.2	13357.7	1474.48	1.11
7.	CHUGOKU	3659.2	4520.6	5652.2	-1131.39	0.80
8.	SHIKOKU	1546.0	1737.7	2388.0	-630.32	0.74
9.	KYUSHU	5263.1	6546.2	8129.7	-1583.50	0.61

POPULATION AND EMPLOYMENT VALUES IN THOUSANDS

had a 2.2 percent share of the total 1970 then the shift index would be 1.10 (2.2/2.0.) since in 1970 it had 10 percent greater share. In Table 15 Sapporo's shift index is 1.13 indicating that its "share" increased by 13 percent during the period under analysis. This technique allows us to easily highlight which RECs grew at the expense of other RECs within the Japanese urban system. It shows for population (and employment) the redistribution within the urban system which took place during the time period under study.

The 1950s saw relative growth in three of the four Hokkaido RECs (Sapporo, Muroran, and Kushiro), according to Table 15. This occurred in part because of the relative depopulation of rural Hokkaido and the migration to these centers which accompanied it. Other net gainers of population were Tokyo, Yokohama, Nagoya, Toyota, Osaka, Kobe, and Hiroshima. All other regions were relative losers of population. Therefore we have a pattern of growth emerging in which growth occurred in and around the three largest regions--Tokyo, Osaka, and Nagoya--and in Hokkaido.

For the 1960s (Table 16) the analysis of population shows the important growth centers were Sapporo, Chiba, Tokyo, Yokohama, Hiratsuka, Osaka, and Wakayama. Again, all but Sapporo are in the Tokyo or Osaka conurbations. This again, indicates considerable centralization within the urban system. Those that lost the biggest shares were in the periphery of the system: Odawara, Tottori, Ube, Omuta, Saga, Sasebo, and Yatsushiro.

Table 17 gives the shift-share analysis for 1950-1970. Appendix 4 gives shift-share tables for employment by type of employment for 1960-1970. In Figure 2 we show the fast-growing regions in terms of population between 1960 and 1970 as the RECs with shift indices greater than one are highlighted.

The shift-share analysis yields some interesting conclusions as shown in Tables 18 and 19 which are extracted from Tables 15-17. Here we have the ten fastest growing regions for 1950-1970 and the ten slowest growing for the same period.

Figure 2: Shift Indices for Japanese Regional Economic Clusters, 1960-1970.

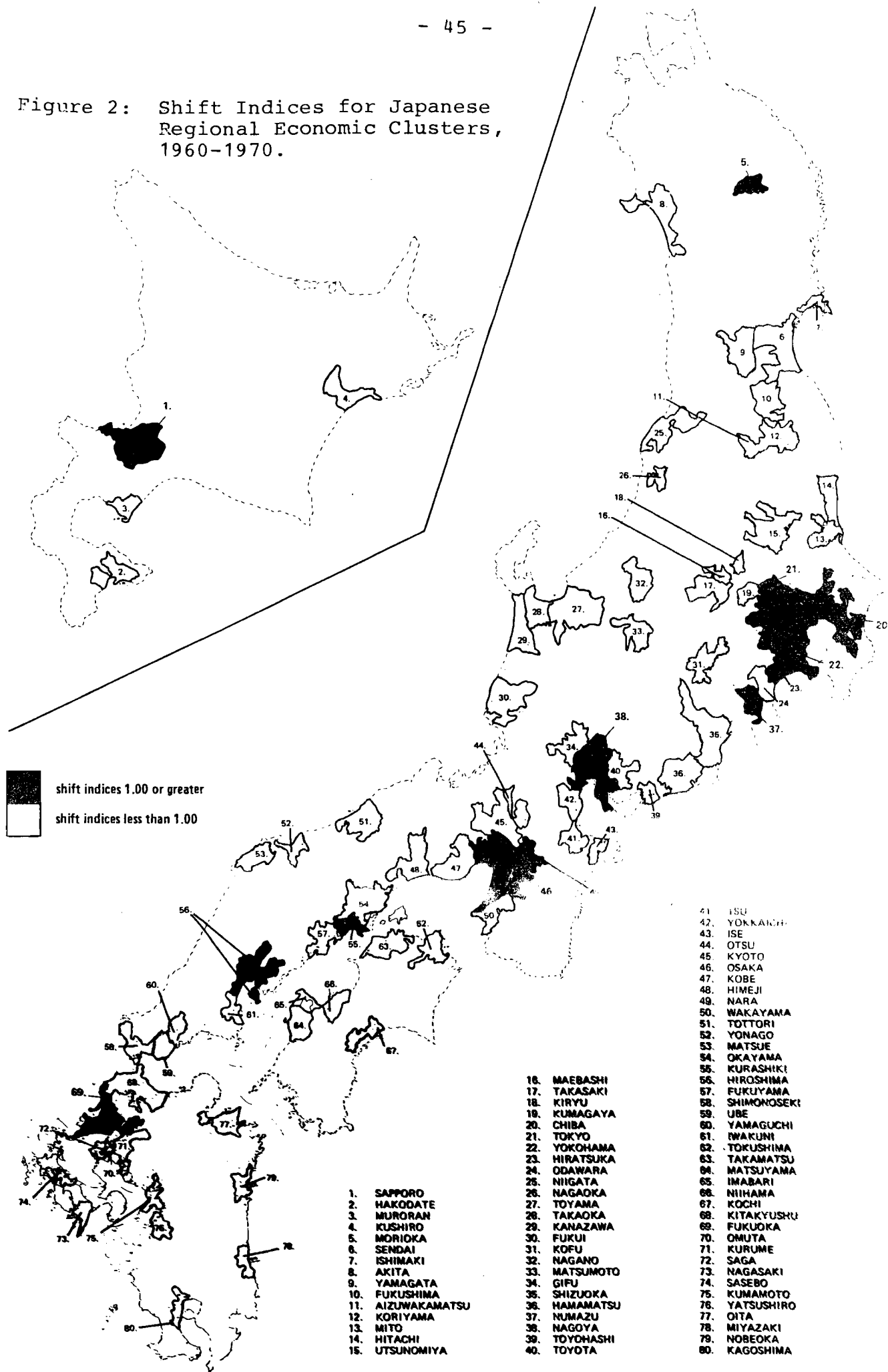


Table 18

Shift-Share Analysis: Fastest Growing RECs
and Major Regions, 1950-1970

<u>City</u>	<u>Population Shift Index</u>		
	<u>1950-1960</u>	<u>1960-1970</u>	<u>1950-1970</u>
Sapporo	1.12	1.11	1.15
Kushiro	1.25	0.99	1.23
Chiba	0.92	1.28	1.18
Tokyo	1.18	1.10	1.30
Yokohama	1.09	1.30	1.42
Hiratsuka	0.97	1.23	1.19
Osaka	1.11	1.16	1.29
Kobe	1.22	0.82	1.01
Nara	0.85	1.13	0.98
Hiroshima	1.02	1.06	1.08

Hokkaido	1.06	1.08	1.14
Kanto	1.10	1.09	1.20
Kinki	1.05	1.06	1.12

Table 19

Shift-Share Analysis: Slowest Growing RECs
and Major Regions, 1950-1970

<u>City</u>	<u>Population Shift Index</u>		
	<u>1950-1960</u>	<u>1960-1970</u>	<u>1950-1970</u>
Yamagata	0.81	0.83	0.67
Odawara	0.93	0.57	0.53
Takaoka	0.81	0.81	0.65
Toyohashi	1.06	0.92	0.81
Tottori	0.82	0.79	0.65
Ube	0.87	0.71	0.62
Niihama	0.83	0.80	0.66
Omuta	0.83	0.70	0.58
Saga	0.85	0.78	0.66
Yatsuhiro	0.86	0.75	0.65

Tohoku	0.87	0.90	0.79
Hokuriku	0.85	0.86	0.73
Shikoku	0.84	0.88	0.74

The fastest-growing regions in Japan were Sapporo, Kushiro, Chiba, Tokyo, Yokohama, Osaka, and Hiroshima as shown in Table 18. The fastest-growing major regions were Hokkaido, Kanto, and Kinki. Most of the fast-growing cities increased their shares more in the period 1960-1970 than they did during the period 1950-1960. This is true for Sapporo, Chiba, Yokohama, Hiratsuka, Osaka, Nara, and Hiroshima. Many of these are suburban cities of the major urban centers, especially Tokyo. For instance, Chiba and Hiratsuka grew less rapidly during the period 1950-1960 than did the REC average but grew quite rapidly as the Tokyo metropolitan region expanded and decentralized greatly during the 1960s. Sapporo appears to be a large independent growth center which increased its population greatly over both periods. Other cities, such as Tokyo and Kobe, grew more slowly in the latter period than in the earlier period. It is seen that Tokyo's preeminence is fading and so is that of the older industrial city of Kobe.

Turning to Table 19, we can see that most of the slow-growing cities are away from the major conurbations of Japan. Yamagata is in the Tohoku region and Takaoka and Tottori are on the Japan Sea; Omuta, Saga, and Yatsushiro are in Kyushu and Niihama is on the island of Shikoku. A perusal of Table 19 indicates that most of the slow-growing regions grew relatively more slowly during the 1960s than during the 1950s: Odawara, Takaoka, Toyohashi, Tottori, Ube, Niihama, Omuta, Saga, and Yatsushiro all followed such a pattern.¹³

Table 20 summarizes additional shift-share analysis for employment by industrial class for several of the fast- and slow-growing metropolitan areas. It is important to see what some of the growth characteristics are of these regions and to see if generalizations can be drawn from these trends. It is clear from Table 20 that the fast-growing regions were growing most quickly in the areas of secondary and service employment. For instance, Chiba had a shift index of 1.77, Yokohama had 1.33 and Hiratsuka had 1.41 for secondary employment. Fast-growing

¹³This is not, however, true when one sees the major regions noted in Table 19. They seem to have grown slightly more quickly (or less slowly) during the 1960-1970 decade.

Table 20

Industrial Structure of Fast-Growing and Slow-Growing RECs:
Shift-Indices, 1960-1970

	<u>Sapporo</u>	<u>Kushiro</u>	<u>Chiba</u>	<u>Tokyo</u>	<u>Yokohama</u>	<u>Hiratsuka</u>	<u>Osaka</u>	<u>Kobe</u>	<u>Nara</u>	<u>Hiroshima</u>
Population	1.21	0.99	1.28	1.10	1.30	1.23	1.16	0.82	1.13	1.06
Total Employment	1.23	1.05	1.20	1.07	1.31	1.26	1.13	0.81	1.11	1.05
Primary Employment	0.93	1.35	0.94	0.96	0.90	1.10	0.92	0.94	1.11	0.84
Secondary Employment	1.20	0.81	1.77	0.99	1.33	1.41	1.03	0.70	1.22	1.07
Wholesale & Retail Employment	1.21	1.07	1.40	1.00	1.17	1.14	1.07	0.88	1.15	1.14
Services Employment	1.27	1.25	1.43	1.02	1.15	1.19	1.08	0.95	1.19	1.09
Government Employment	0.87	1.04	1.30	1.01	1.07	1.15	1.07	1.07	1.01	1.01

	<u>Yamagata</u>	<u>Odawara</u>	<u>Takaoka</u>	<u>Toyohashi</u>	<u>Tottori</u>	<u>Ube</u>	<u>Niihama</u>	<u>Omuta</u>	<u>Saga</u>	<u>Yatsushiro</u>
Population	0.83	0.57	0.81	0.92	0.79	0.71	0.80	0.70	0.78	0.75
Total Employment	0.84	1.02	0.83	1.00	0.83	0.78	0.88	0.80	0.82	0.75
Primary Employment	1.00	1.21	0.95	1.10	0.96	1.13	1.07	1.16	1.16	1.10
Secondary Employment	1.12	1.00	1.03	1.08	1.27	0.65	0.86	0.64	0.77	0.86
Wholesale & Retail Employment	0.91	1.91	0.82	0.94	0.85	0.79	0.88	0.78	0.64	0.76
Services Employment	0.97	0.93	0.93	1.01	0.94	0.87	0.92	0.90	0.25	0.83
Government Employment	0.80	1.04	0.99	0.82	0.83	0.86	0.90	2.03	4.07	0.89

regions also show relative increases in services and wholesale and retail trade. The slow-growing regions, on the other hand, had mostly low coefficients for secondary employment. For instance, Omuta and Ube had shift-indices of 0.64 and 0.65 respectively. It is clear that the slow-growing regions had high concentrations in primary industry; see for instance the relatively high shift indices for Odawara, Saga, and Omuta.

The data in this section bring the conclusions drawn in Section 3. into even more clear focus. The centralization of the Japanese urban system--and a centralization reinforced by manufacturing and service expansion--proceeded through the 1950s and 1960s. The growth of employment as a determinant of population change is emphasized in Section 4.3.

4.3. Regression Analysis of Population and Employment Growth Between 1960 and 1970

In order to further understand the growth of population and employment of the Japanese urban system during the 1960s, we estimated some regression equations to predict these variables. The independent variables (taken from our Regional Data Bank in Appendix 2) in these regressions are the economic characteristics of the RECs. Although there are other (non-economic) determinants of growth, we present these regressions as a first step towards a fuller understanding of the growth process.

In Equation (1) the percent change in REC population between 1960 and 1970 (PCN) is regressed on several characteristics of the REC's labor force which were hypothesized to influence employment and population growth.

$$\begin{aligned} \text{PCN} = & 16.64 + 0.38 \text{ PCWSG} - 0.96 \text{ PYNG60} + 0.89 \text{ PWC70} \\ & (1.19) \quad (7.82) \quad (2.33) \quad (3.83) \\ & - 106.45 \text{ LGEHPC70} - 0.45 \text{ PEP70} - 3.88 \text{ PUNE70} \\ & (-2.14) \quad (-3.12) \quad (-2.39) \end{aligned} \tag{1}$$

$$R^2 = 0.80$$

where the numbers in parenthesis under each of the regression coefficients are the t-statistics; all are significant at a 95 percent confidence level. In Equation (1):

- PCWSG = percent change in wholesale, services and government employment, 1960-1970.
- PYNG60 = percent of the RECs' population 0-14 years of age in 1960.
- PWC70 = percent of the RECs' employment in white collar jobs in 1970.
- LGEHPC70 = local government expenditure per capita on housing measures, 1970.
- PEP70 = percent of the RECs' employees in primary sector 1970.
- PUNE70 = percent of the RECs' labor force unemployed in 1970.

Equation (1) indicates that population growth was positively related to percent change in tertiary employment (PCWSG) and also to percent of employment in white collar jobs during the decade (PWC70). Not surprisingly the growth in REC population was negatively related to percent of population very young in 1960 (PYNG60), percent of 1970 employment in primary sector (PEP70), and the percent of unemployed labor force (PUNE70). Population growth did not occur in RECs where there were great amounts of local public housing built; this can be seen with the negative sign attached to LGEHPC70 and can be explained by the fact that local public housing was built in largely poor and declining regions.

To assess the relative quantitative importance of the relationships between each of the variables in Equation (1) and the dependent variable, Equation (1) was evaluated at the means of each of the independent variables to yield Equation (2):

$$PCN + 16.64 + \frac{PCWSG}{18.08} - \frac{PYNG60}{28.63} + \frac{PWC70}{22.09} - \frac{LGEHPC70}{2.47} - \frac{PEP70}{7.54} - \frac{PUNE70}{5.59} \quad (2)$$

Equation (2) indicates that percent young (PYNG60) was the largest negative contributor to population growth and percent white collar (PWC70) was the largest positive contributor.

Next we estimated, in Equation (3), a regression to predict the percent change in total employment (PCE) between 1960 and 1970. Here, the independent variables are as follows:

- PCWSG = percent change in wholesale, services and government employment, 1960-1970.
- PEP70 = percent of employment in primary industry in 1970.
- PUNE70 = percent of the labor force unemployed in 1970.
- PWSG60 = percent of employment in wholesale, services and government in 1960.
- NMVAN = percent of population who have moved in between 1965 and 1970.
- PRAPVD70 = percent of RECs roads that were paved in 1970.

$$\begin{aligned} \text{PCE} = & 15.46 + .45 \text{ PCWSG} - .38 \text{ PEP70} - 7.94 \text{ PUNE70} \\ & (1.42) \quad (6.93) \quad (1.72) \quad (4.75) \end{aligned} \quad (3)$$

$$\begin{aligned} & .54 \text{ PWSG60} + .63 \text{ NMVDN} + .11 \text{ PRAPVD70} \\ & (3.16) \quad (1.62) \quad (1.39) \end{aligned}$$

$$R^2 = 0.76$$

Equation (3) shows that employment growth was positively related to percent employment in tertiary jobs (PWSG60) in 1960 as well as to the percentage change in the employment in this category over the decade (PCWSG). Employment growth was also positively related to percentage of the population recently moved (NMVDN) and the percentage of the RECs roads that were paved (PRAPVD). Employment growth is seen to be negatively related to percent of labor force unemployed in 1970 (PUNE70).

The relative quantitative importance of each of the independent variables to the dependent variable is highlighted in Equation (4) which presents Equation (3) evaluated at the means of each of the independent variables.

$$\begin{aligned} \text{PCE} = 15.46 + & \frac{\text{PCWSG}}{21.4} - \frac{\text{PEP70}}{6.38} - \frac{\text{PUNE70}}{11.43} - \frac{\text{PWSG60}}{18.26} \\ & - \frac{\text{NMVDN}}{14.80} + \frac{\text{PRAPVD}}{2.20} \end{aligned} \tag{4}$$

From (4) it is seen that the most important contributor to employment growth was percent change in wholesale, services and government employment.

5. JAPANESE URBANIZATION IN A WORLDWIDE CONTEXT, 1950-1970

5.1. Introduction

In this section, we present some views of Japanese urban development in comparison to the experiences of other industrialized countries and some less developed Asian countries. We want to see to what extent the rapid urbanization in Japan was replicated in other countries, to what extent suburbanization took place elsewhere in the world, and other matters pertaining to our analyses in Section 3. When possible, we make use of functional urban regions as our unit of comparative analysis, but in many countries such definitions are not available. In these cases, we used the individual countries' definition of what constituted urban areas. Some data are derived from the work of Davis [1969], whose study attempts to comprehensively catalogue world urbanization.

Here we concentrate on the postwar period, with particular emphasis on the 1960s; however, in some instances we extend our analysis back to 1920. It should be noted that international comparisons of urbanization are difficult to make even for contemporaneous examples due to differing definitions and data collection methods. Attempts to compare phenomenon over time are even more difficult. This brief analysis should be considered in that light.¹⁴ Clearly, further analysis must be done.¹⁵

¹⁴ Davis [1969; Chapter 2] contains a discussion of some of these problems.

¹⁵ The current project at IIASA on comparative urban development has as its principal aim the development of a consistent cross-country data base for functional urban regions. In this section we employ some of the data collected in that project.

5.2. Comparative Urban Development in the 20th Century¹⁶

5.2.1. Population in Urban Regions

We observe the growth of urbanization in several developed countries (Japan, Sweden, US and USSR) and one less developed country (India) for the period 1920 to 1970 in Table 21 and Figure 3 as measured by the percent of national population in urban regions. An interesting aspect of Table 21 is a comparison between the experiences of Japan and the United States. In 1920, Japan was about one third as urbanized as the US, but Japan's dynamic urban growth made it almost as urbanized as the US by 1970. Japan's population in urban regions increased 3.99 times between 1920 and 1970, compared to an increase of 1.43 times for the United States. Also note that Japan's urbanization was rapid prior to World War II, nearly doubling between 1920 and 1940 (see column 7 of Table 21) and the rate of increase between 1920 and 1940 is exactly what it was between 1950 and 1970. Therefore Japanese urban development can be viewed as substantial both before and after the war. It is not merely a postwar phenomenon. Table 21 also allows us to compare Japan and another Asian country, India. The data indicate that Indian urbanization is quite low in relation to Japan (19.9 percent urbanized in 1970 versus 72.2 percent for Japan), and that the rate of urbanization has been proceeding more slowly (see columns 7-9 of Table 21).

Table 22 shows data derived from the Davis study for Japan and nine other countries for 1950 through 1970.¹⁷ Again we display the percent of the total population which was urbanized

¹⁶Sources of data for this section include Berry [1973a, 1973b], London School of Economics and Political Science [1974-1975], Great Britain Department of the Environment [1976], Sherrill [1976, 1977], Hay and Hall [1977a, 1977b, 1977c, 1977d], Falk [1976], Odmann and Dahlberg [1970] and Drewett, Goddard and Spence [1975].

¹⁷The data for Tables 21 and 22 are not strictly comparable since Davis used somewhat different sources and estimated his data for 1970. However Davis argues that, to a significant degree, his data are internally consistent.

Table 21

Percent of Population in Urban Regions, Japan, India
Sweden, United States and USSR, 1920-1970

	<u>1920</u>	<u>1930</u>	<u>1940</u>	<u>1950</u>	<u>1960</u>	<u>1970</u>	<u>Ratio of Years</u>		
							<u>1940</u> <u>1920</u>	<u>1970</u> <u>1950</u>	<u>1970</u> <u>1920</u>
Japan ^a	18.1	24.1	37.9	37.5	63.5	72.2	1.93	1.93	3.99
India ^b	11.2	12.0	13.9	17.3	17.9	19.9	1.24	1.15	1.78
Sweden ^c	45.2	48.5	56.2	66.2	72.7	81.4	1.24	1.23	1.80
United States ^d	51.2	56.1	56.5	59.0	69.8	73.4	1.10	1.24	1.43
USSR ^e	17.9	19.6	32.5	38.9	48.8	56.3	1.81	1.44	3.14

Sources: ^aJapan Bureau of Statistics, Office of the Prime Minister [1971]
^bTanifuji [1977]
^cFalk [1976]
^dU.S. Department of Commerce, Bureau of the Census [1975]
^eMickiewicz [1973]

Figure 3

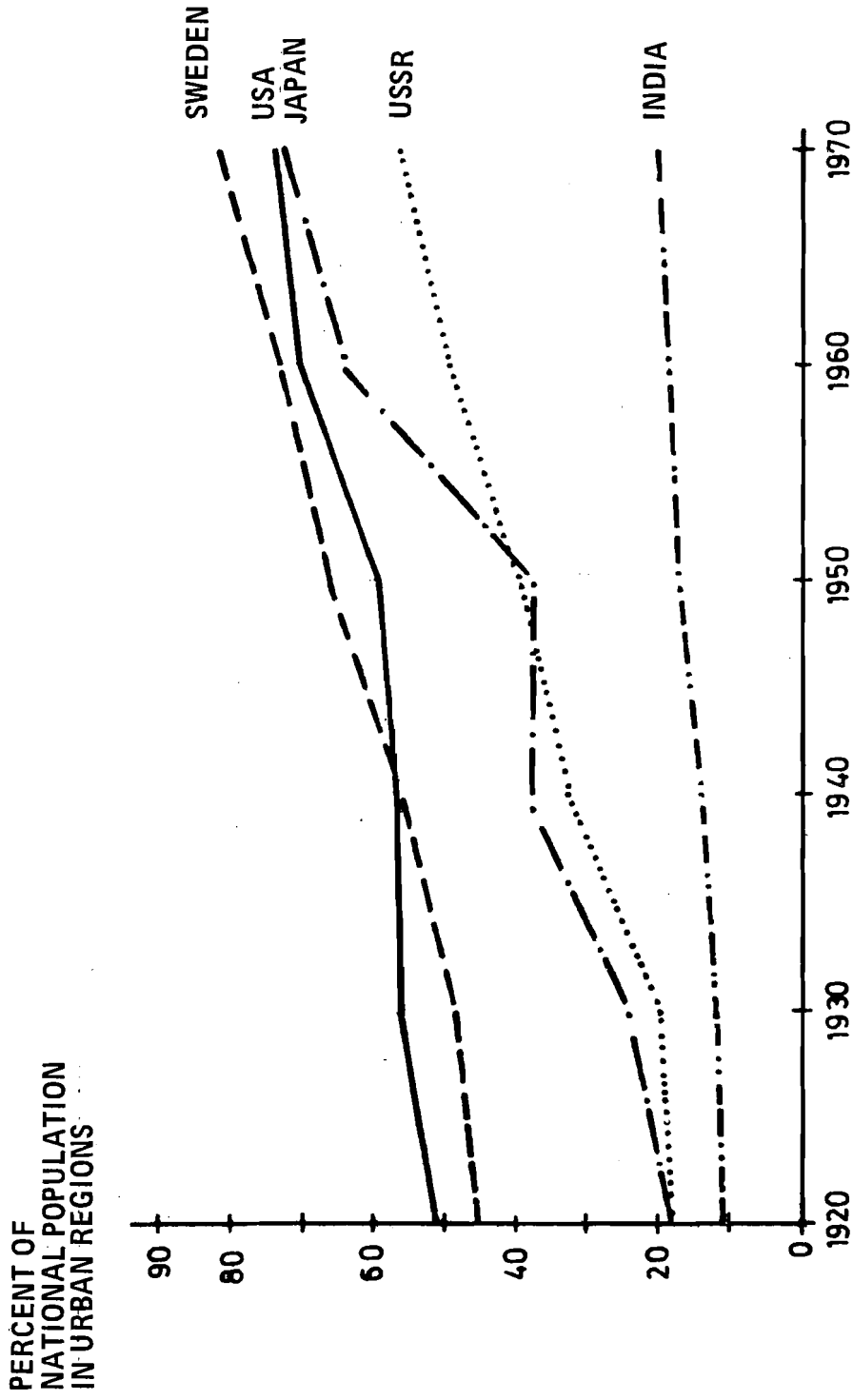


Figure 3: Percent of Population in Urban Regions, Japan, India, Sweden, United States and USSR, 1920-1970.

Table 22

Comparative Statistics on Worldwide Urbanization, 1950-1970

	<u>Percent Population in Urban Regions</u> (percent)			<u>Average Annual Growth Rates</u> (percent)	
	<u>1950</u>	<u>1970</u>	<u>Ratio of 1970 to 1950</u>	<u>1950-1960</u>	<u>1960-1970</u>
Japan	37.4	83.2	2.22	6.6	3.7
France	54.1	67.9	1.26	2.2	2.2
Federal Republic of Germany	72.5	82.2	1.13	1.6	1.7
United Kingdom	77.5	79.1	1.02	0.5	0.7
Sweden	55.4	66.1	1.19	1.6	1.6
India	17.1	18.8	1.10	2.4	2.9
USSR	42.5	62.3	1.47	3.5	3.5
Austria	49.0	51.0	1.04	0.4	0.8
USA	64.0	75.2	1.18	2.7	2.1
People's Republic of China	11.0	16.5	2.14	6.4	6.0

Source: Davis [Tables C and D].

and the average annual growth rates of population for the 1950s and 1960s. Again, Japan shows consistently higher growth than all countries in Table 22 with the exception of the Peoples Republic of China for which accurate data are probably not really available. In nearly all cases, the population growth rates slowed between the decades. Japan's growth relative to the other countries is particularly great in the 1950s.

5.2.2. The Population of the Large Cities in Relation to National Population

There has been much discussion in the urbanism literature about the importance of large cities and their primacy within the city system. In order to better understand these relationships in a cross-cultural setting, we present Table 23 and Table 24. In Table 23 we show the "Four City Index" (FCI) of first city primacy as defined by Davis [pp. 242-246]. The FCI is a measure of dominance of the largest city in a country, e.g., Tokyo, with respect to the size of the next three largest, e.g., Osaka, Nagoya, and Yokohama, and is calculated as the ratio of the population of the first largest city to the sum of the next three largest.¹⁸ An examination of Table 23 indicates that Tokyo's dominance of the city system is not as great as in some other countries. France, with the importance of Paris (see Glickman [1977b; Section 4]) has the highest FCI of the countries listed there. Tokyo's role vis-à-vis the three next largest cities is most like that of London's. India and the USSR have the least dominant largest cities, Calcutta and Moscow respectively.

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Davis justifies this calculation because it always contains the same number of cities in each country and ought to have the same relationship to the urban hierarchy in each. The index is independent of the total number of cities in a country and has enough cities to allow one to get some information about the largest city's position relative to others. Although the number of cities is arbitrary, Davis [p. 243] says that the four city index is highly correlated with ten- and two-city indices. Despite its imperfections, it is a useful tool for our comparative purposes here.

Table 23

Four-City Index of First-City Primacy for
Japan and other countries, 1950-1970

	<u>1950</u>	<u>1960</u>	<u>1970</u>
Japan	1.54	1.62	1.53
France	3.65	3.57	3.10
Federal Republic of Germany	0.85	0.96	1.03
United Kingdom	1.48	1.51	1.53
Sweden	NA	NA	1.14
India	0.76	0.72	0.68
USSR	1.20	1.10	0.98
Austria	2.87	2.80	2.70

Source: Davis [Table G].

Table 24, which is based on data for functional urban regions indicates the relative importance of the largest, three largest and ten largest regions in each country compared to the entire national population. We see that Tokyo's dominance over the Japanese urban system is somewhat greater than New York's relative to the United States (17.1 percent versus 9.0 percent in 1970 if one uses the Daily Urban System definition of regions for the US) and the share of the three and ten larger regions is also greater. Note, in addition, that Japan's largest cities are increasing their relative share of population¹⁹ whereas in the United States the share is declining temporally. This is consistent with our analysis in Section 3. In comparison to the smaller countries such as Denmark, Sweden and Austria, Japan's larger cities are clearly less dominant within the city system. Therefore, Japan's large cities are in the middle of the countries surveyed with respect to this dimension of urban development.

5.2.3. Spatial Structure of Urban Regions

Tables 25 and 26 give some indications of the spatial structure of metropolitan regions in several countries during the postwar period. In Table 25 we display the percent of functional urban regions' population residing in central cities. These central-suburban breakdowns²⁰ reveal that Japan's regions are somewhat more centralized than the SMSAs of the United States, but less than the SMLAs of Great Britain, both of which are readily comparable with regard to regional definitions. Concerning the rate of decentralization, we show percentage

¹⁹ Sweden's large regions also had an increasing share of total population while the FRG had mixed results. India's largest cities have had slight gains in their share.

²⁰ For the FRG, Denmark, Austria and the United Kingdom (MELA definition), the areal definitions involve more hinterland than is commonly thought of as "suburban". For these countries, the functional urban regions collectively exhaust or nearly exhaust the entire national territory.

Table 24

Largest Functional Urban Regions as a Percent of Total National Population,
1950-1971 (percent)

Nation	Name of Urban Region	Year	Largest Region	Three Largest Regions	Ten Largest Regions
Japan	REC	1950	10.6	19.4	28.2
		1960	14.0	24.8	34.7
		1970	17.1	30.2	41.8
United States	DUS	1960	9.1	17.7	35.2
		1970	9.0	18.1	35.4
	SMSA	1960	6.1	12.4	23.9
		1970	5.7	12.6	23.7
Great Britain	MELA	1971	16.4	25.5	40.0
Sweden	A-Region	1950	16.8	34.8	47.7
		1960	18.2	37.1	50.5
		1970	19.1	38.8	52.4
Denmark	Urban Region	1970	38.6	56.3	82.6
Austria	FUR	1971	34.4	54.8	90.0
Federal Republic of Germany	FUR	1961	5.1	12.9	34.6
		1970	4.9	13.4	33.9
India	Urban Agglomerations	1961	1.3	2.9	4.6
		1971	1.3	3.0	5.2

Table 25

Metropolitan Spatial Structure of Functional Urban Regions
1950-1971

<u>Country</u>	<u>Percent of Functional Urban Regions in Central Cities, 1950-1970</u>			<u>Rate of Metropolitan Decentralization (percent of base year)</u>	
	<u>1950 or 1951</u>	<u>1960 or 1961</u>	<u>1970 or 1971</u>	<u>1960-1961 to 1970-1971</u>	<u>1950-1951 to 1970-1971</u>
Japan	55.0	58.5	54.8	93.7	99.6
Denmark	NA	NA	44.0	NA	NA
Austria	NA	NA	39.8	NA	NA
Great Britain-SMLA	66.6	64.2	59.8	93.1	89.8
Great Britain-MELA	55.4	53.7	49.5	92.2	89.4
Federal Republic of Germany	NA	34.6	32.9	95.1	NA
United States-SMSA	55.3	51.4	45.8	89.1	82.8

change of the central city proportion in columns 4 and 5 of Table 25. Thus, the proportion of 1970 population in Japanese REC central cities is 93.7 percent of that in 1960 and the proportion in 1970 is 99.6 percent of the 1950 figure. These measure the relative decentralization of Japanese regions. Columns 4 and 5 show that Japan has decentralized much less rapidly than the US and Great Britain during the postwar period; these countries had 1970 central city proportions less than 90 percent of the 1950 counterparts. We also see that the relative rates of suburbanization were not greatly different among these three countries during the 1960s. The more rapid suburbanization in the US and Great Britain occurred in the 1950s.

Table 26 gives yet another view of the suburbanization process, showing the decennial growth rates for central cities and their hinterlands for the 1960s. For Japan and the US, the hinterland growth rates were approximately twice those of the cores, although the ratio was somewhat greater for the US; for West Germany, the rate of hinterland growth was more than three times that of German central cities. Great Britain showed an absolute decline of the central cores cities, the only country to experience absolute decline among the four.

5.2.4. Regional Growth and Region Size

How does region size relate to regional growth? We attempt to answer this question in Table 27. We have already seen (in Section 3.) that, in the 1960s, large Japanese regions grew much faster than smaller ones. The size class of 100,000 to 200,000 population grew by only 1.8 percent between 1960 and 1970, only 7.5 percent of the growth rate of all cities. Another pattern is seen in the data for West Germany. There, the growth rates are much more similar across region size categories (the standard deviation of growth rates from the mean is smaller than that for Japan both absolutely and in relation to the mean) and the highest growth is attained for the middle-sized regions between 500,000 and 700,000 population.

Table 26

Percent Change in Population in Core and Hinterland Subregions
for Japan, Federal Republic of Germany and
United Kingdom, 1960-1970

	<u>Core</u>	<u>Hinterland</u>
Japan	15.0	33.8
Federal Republic ^a of Germany	3.2	11.3
United Kingdom ^b	-2.8	17.2
United States ^c	10.0	23.5

^a1961 to 1970

^b1961 to 1971

^cFor SMSAs

Table 27

Population Growth by Region Size for Japan, Federal Republic
Germany, India and United States, 1960-1970

Size Class (000)	Japan	Federal Republic of Germany	India ^a	U.S. ^b
100- 200	1.8	6.1	32.8	22.6
200- 300	9.1	6.0	40.8	
300- 400	6.6	8.6	44.6	-3.0
400- 500	11.5	8.0	48.3	
500- 600	12.8	10.5	34.9	
600- 700	8.0	14.1	33.3	
700- 800	17.6	-	54.2	16.7
800- 900	30.1	4.1	24.1	
900-1,000	18.6	8.6	34.8	
1,000 and more	33.8	8.5	39.8	7.3
Allerties in these size classes	24.0	8.5	39.5	10.7
Standard Deviation	10.3	2.8	8.7	NA
Ratio of growth rate of smallest city size class to all city growth rate	0.075	0.718	0.830	2.112
Ratio of growth rate of largest city size class to all city growth rate	1.408	1.000	1.008	0.682

^a1961-1971

^bCategories are, 100,000-250,000, 250,000-500,000, 500,000-1,000,000 and 1,000,000 and more.

A similar situation exists for India, although the overall growth rates are much higher in most instances: the highest growth rate category is for these cities between 700,000 and 800,000 persons. The US case is different from others in that it is the smallest regions that are growing the fastest.

6. CONCLUSIONS

In this essay we have traced the development of the Japanese urban system from 1950 to 1970. This period was one of high economic growth and the transformation of the Japanese economy which occurred in those years was accompanied by great changes in the spatial structure of society. These alterations in living patterns--as shown by rapid urbanization (which were continuations of prewar trends)--have been charted in the first four sections of this paper. After discussing the usefulness of functional urban regions as units of urban analysis, we introduced the Regional Economic Cluster, a functional urban region definition for Japan. Then, in Sections 3. and 4., we analyzed population and employment data for the RECs.

Several conclusions emerge from this analysis. First, the Japanese population is highly concentrated in a relatively small land area and number of city-regions. Two-thirds of the 1970 population lived in the eighty Regional Economic Clusters and a full one-half in eight Standard Consolidated Areas. Second, the system of cities appeared to centralize between 1950 and 1970 as there was relatively faster growth in a few large population centers, especially those near Tokyo and Osaka. Third, not only were the "big getting bigger," but many of the important growth centers were manufacturing-based. Fourth, there was centralization in the 1950s within metropolitan areas followed by some decentralization--that is, the suburbs grew more quickly than the central cities--in the 1960s. Finally, employment by place of work was more heavily centralized within metropolitan areas than employment by place of residence.

These results show that Japanese urban development followed a somewhat different pattern than that of other industrialized countries. We have briefly indicated some comparative statistics in Section 5. First, we found that Japanese urban development was much more rapid than that of other industrialized countries. Second, the large cities of Japan relative to other cities in city system was not as great as some other large countries. However, the dominance of Tokyo was increasing over time; New York's and London's importance, on the other hand, were decreasing. Third, we indicated that Japan's regions were more spatially centralized than those of other countries and that metropolitan decentralization was less than in the US and Great Britain, especially in the 1950s.

The major phenomenon of the 1950s and 1960s--that of large Japanese regions growing at the expense of smaller ones--came in the face of central government policy aimed at dispersing population in an effort to relieve negative externalities in the core. These policies are the topic of Glickman [1977b] where it is shown that they were relatively ineffective. Such programs as those instituting New Industrial Cities in backward regions to provide growth poles seemed not to work.

However, we shall see (in Glickman [1977a]) that some population dispersal began in the 1970s. Then, although the big-getting-bigger phenomenon continued, it was on a much less significant scale and was principally due to higher urban natural growth rates; net outmigration from the large centers was also apparent, especially beginning in the late 1960s. The 1970s pattern, we argue in Glickman [1977a and 1977b], occurred independent of public policy and more closely resembled situations in the US and Western Europe than the phenomenon reviewed in this essay. We argue here that Japan went through a stage of urban development in the 1950s and 1960s that other developed nations passed through earlier in this century. Japan had rapid urbanization, growth of large cities and little metropolitan decentralization in these decades in the same way that the US passed through such a stage during the first half of the twentieth century.

APPENDIX 1

COMPONENTS OF JAPANESE REGIONAL
ECONOMIC CLUSTERS

Listed below are the cities, towns and villages which constitute the eighty Regional Economic Clusters. The RECs are given according to prefecture (ken) and attached prefectural code (Hokkaido = 01, Iwate = 03, ..., Kagoshima = 46). Central cities are recorded in capital letters followed by the component cities, towns, and villages. Each municipality has a city code (from the 1970 Population Census). For instance, Sapporo-shi is 01201 (city 201 in the 01st prefecture). Cities which are in prefectures other than their REC's central city have a parenthesis after their city code, representing the prefecture in which that city is located.

01 - HOKKAIDO

201 - SAPPORO-SHI

203 Otaru-shi
217 Ebetsu-shi
307 Eniwa-cho

202 - HAKODATE-SHI

335 Kamiiso-cho
337 Nanae-cho
338 Kameda -cho

205 - MURORAN-SHI

230 Noboribetsu-shi
576 Date-cho

206 - KUSHIRO-SHI

668 Shiranuka-cho

03 - IWATE-KEN

201 - MORIOKA-SHI

323 Tonan-mura

04 - MIYAGI-KEN

201 - SENDAI-SHI

203 Shiogama-shi
206 Shiraishi-shi
207 Natori-shi
208 Kakuda-shi
321 Ogawara-machi
322 Murata-machi
323 Shibata-machi
361 Watari-cho
362 Yamamoto-cho
381 Iwanuma-machi
382 Akiu-machi
401 Matsushima-cho
402 Tagajo-machi
403 Izumi-machi

201 - SENDAI-SHI (continued)	202 - AIZUWAKAMATSU-SHI	10 - GUMMA-KEN	13 - TOKYO-TO
405 Miyagi-machi	424 Kawahigashi-mura	201 - MAEBASHI-SHI	100 - TOKYO KU
406 Rifu-cho	442 Hongo-machi	208 Shibukawa-shi	201 Hachioji-shi
503 Kogota-cho		301 Kitatachibana-mura	202 Tachikawa-shi
	203 - KORIYAMA-SHI	304 Ogo-machi	203 Musashino-shi
202 - ISHINOMAKI	207 Sukagawa-shi	345 Yoshioka-mura	204 Mitaku-shi
562 Yamoto-cho	323 Motomiya-machi		206 Fuchu-shi
581 Onagawa-cho	521 Miharu-machi	202 - TAKASAKI-SHI	207 Akishima-shi
		209 Fujioka-shi	208 Choiu-shi
05 - AKITA-KEN	08 - IBARAGI-KEN	211 Annaka-shi	209 Machida-shi
201 - AKITA-SHI	201 - MITO-SHI	321 Haruna-machi	210 Koganei-shi
205 Honjo-shi	209 Nakaminato-shi	323 Misato-machi	211 Kodaira-shi
206 Oga-shi	213 Katsuta-shi	324 Gumma-machi	212 Hino-shi
361 Gojome-machi	216 Kasama-shi	361 Shin-machi	213 Higashimurayama-shi
362 Showa-machi	305 Uchihara-machi	363 Yoshii-machi	214 Kokubunji-shi
363 Hachirogata-machi	309 Oorai-machi	401 Matsuida-machi	215 Kunitachi-shi
364 Iitagawa-machi	321 Tomobe-machi	464 Tamamura-machi	216 Tanashi-shi
365 Tenno-machi	342 Naka-machi		217 Hoya-shi
366 Ikawa-mara	344 Omiya-machi	203 - KIRYU-SHI	218 Fussa-shi
405 Iwaki-machi		484 Kasakake-mura	219 Komae-shi
	202 - HITACHI-SHI	501 Omama-machi	220 Higashiyamato-shi
06 - YAMAGATA-SHI	212 Hitachiota-shi		221 Kiyose-shi
201 - YAMAGATA-SHI	214 Takahagi-shi	11 - SAITAMA-KEN	222 Higashikurume-shi
206 Sagae-shi	215 Kitaibaraki-shi	202 - KUMAGAYA-SHI	302 Hamura-machi
207 Kaminoyama-shi	341 Tokai-mura	218 Fukaya-mura	304 Akita-machi
210 Tendo-shi	381 Juo-machi	346 Kawajima-mura	321 Tama-machi
211 Higashine-shi		347 Yoshimi-mura	322 Inagi-machi
301 Yamanobe-machi	09 - TOCHIGI-KEN	401 Osato-mura	342 Murayama-machi
302 Nakoyama-machi	201 - UTSUNOMIYA-SHI	402 Konan-mura	203 (08) Tsuchiura-shi
	205 Kanuma-shi	403 Menuma-machi	204 (08) Koga-shi
07 - FUKUSHIMA-KEN	207 Imaichi-shi	406 Kawamoto-mura	208 (08) Ryugasaki-shi
201 - FUKUSHIMA-SHI	211 Yaita-shi	407 Hanazono-mura	217 (08) Toride-shi
210 Nihonmatsu-shi	304 Kawachi-machi		444 (08) Ushiku-machi
301 Kori-machi	361 Mibu-machi	12 - CHIBA-KEN	563 (08) Fujishiro-machi
302 Date-machi	362 Ishibashi-machi	201 - CHIBA-SHI	364 (09) Nogi-machi
303 Kunimi-machi	385 Ujiiie-machi	210 Mobara-shi	366 (09) Fujioka-machi
305 Hobara-machi	386 Takanezawa-machi	213 Togane-shi	201 (11) Kawagoe-shi
309 Iino-machi	401 Minaminasu-mura	219 Ichihara-shi	203 (11) Kawaguchi-shi
	402 Karasuyama-machi	321 Yotsukaido-machi	204 (11) Urawa-shi
		402 Omaishirasato-machi	205 (11) Omiya-shi
		403 Kujukuri-machi	208 (11) Tokorozawa-shi
		425 Honno-machi	209 (11) Hanno-shi
		444 Ohara-machi	210 (11) Kasu-shi
			212 (11) Higashimatsu- yama-shi
			213 (11) Iwatsuki-shi
			214 (11) Kasukabe-shi
			215 (11) Sayama-shi
			216 (11) Hanyu-shi
			217 (11) Konosu-shi
			218 (11) Ageo-shi

100 - TOKYO KU (continued)

- 305 (12) Shonan-machi
- 322 (12) Shisui-machi
- 202 (14) Kawasaki-shi
- 209 (14) Sagamihara-shi
- 211 (14) Hadano-shi
- 212 (14) Atsugi-shi
- 323 (14) Zama-machi
- 343 (14) Isehara-machi

14 - KANAGAWA-KEN

100 - YOKOHAMA-SHI

- 201 Yokosuka-shi
- 204 Kamakura-shi
- 205 Fujisawa-shi
- 207 Chigasaki-shi
- 208 Zushi-shi
- 213 Yamato-shi
- 301 Yamana-shi
- 322 Ebina-shi
- 324 Ayase-shi

203 - HIRATSUKA-SHI

- 321 Samukawa-machi
- 341 Oiso-machi
- 342 Ninomiya-machi

206 - ODAWARA-SHI

- 362 Oi-machi
- 363 Matsuda-machi
- 364 Yamakita-machi
- 365 Minamishigara-machi
- 381 Tachibana-machi
- 382 Hakone-machi
- 383 Manatsuru-machi
- 394 Yugawara-machi

15 - NIIGATA-KEN

201 - NIIGATA-SHI

- 206 Shibata-shi
- 207 Niitsu-shi
- 220 Shirone-shi
- 303 Suibara-shi

100 - TOKYO KU (continued)

- 220 (11) Yono-shi
- 221 (11) Soka-shi
- 222 (11) Koshigaya-shi
- 223 (11) Warabi-shi
- 224 (11) Toda-shi
- 225 (11) Iruma-shi
- 226 (11) Hatogaya-shi
- 227 (11) Asaka-shi
- 302 (11) Okegawa-machi
- 303 (11) Kitamoto-machi
- 304 (11) Fukiage-machi
- 305 (11) Adachi-machi
- 306 (11) Niiza-machi
- 307 (11) Yamato-machi
- 321 (11) Fukuoka-machi
- 322 (11) Oi-machi
- 323 (11) Fujimi-machi
- 324 (11) Miyoshi-mura
- 325 (11) Sakado-machi
- 326 (11) Moroyama-machi
- 328 (11) Tsurugashima-machi
- 329 (11) Hidaka-machi
- 425 (11) Otome-mura
- 441 (11) Yashio-machi
- 442 (11) Miyashiro-machi
- 443 (11) Kuki-machi
- 444 (11) Hasuda-machi
- 445 (11) Shiraoka-machi
- 446 (11) Shobu-machi
- 461 (11) Kurihashi-machi
- 462 (11) Washimiya-machi
- 463 (11) Satte-machi
- 464 (11) Sugito-machi
- 465 (11) Matsubushi-machi
- 466 (11) Yoshikawa-machi
- 467 (11) Misato-machi
- 468 (11) Showa-machi
- 203 (12) Ichikawa-shi
- 204 (12) Funabashi-shi
- 207 (12) Matsudo-shi
- 208 (12) Noda-shi
- 211 (12) Narita-shi
- 212 (12) Sakara-shi
- 216 (12) Narashino-shi
- 217 (12) Kashiwa-shi
- 220 (12) Nagareyama-shi
- 221 (12) Yachiyo-shi
- 222 (12) Abiko-shi
- 301 (12) Urayasu-machi
- 302 (12) Kamagaya-machi

202 - NAGAOKA-SHI

- 211 Mitsuke-shi
- 401 Koshiji-machi
- 402 Mishima-machi

16 - TOYAMA-KEN

201 - TOYAMA-SHI

- 204 Uozu-shi
- 206 Namerikawa-shi
- 301 Osawano-machi
- 302 Oyama-machi
- 321 Funabashi-mura
- 322 Kamiichi-machi
- 323 Tateyama-machi
- 361 Yatsuo-machi
- 362 Fuchu-machi
- 381 Kosugi-machi

202 - TAKAOKA-SHI

- 203 Shioaminato-shi
- 205 Himi-shi
- 208 Tonami-shi
- 209 Oyabe-shi
- 382 Daimon-machi
- 384 Oshima-machi
- 422 Fukuoka-machi

17 - ISHIKAWA-KEN

201 - KANAZAWA-SHI

- 207 Hakui-shi
- 341 Matsuto-machi
- 342 Mikawa-machi
- 343 Tsurugi-machi
- 344 Nonoichi-machi
- 361 Tsubata-machi
- 362 Takamatsu-machi
- 363 Nanatsuka-machi

201 - KANAZAWA-SHI (continued)	522 Togura-machi	202 - HAMAMATSU-SHI	304 Nagakute-shi
364 Unoke-machi	541 Obuse-machi	211 Iwata-shi	321 Asahi-cho
365 Uchinada-machi	582 Toyone-machi	213 Kagegawa-shi	341 Nichibiwajima-obo
383 Shio-machi	583 Shinano-machi	216 Fukuroi-shi	342 Toyoyama-mura
385 Oshimizu-machi	584 Mure-mura	217 Tenryu-shi	343 Shikatsu-cho
		218 Hamakita-shi	344 Nishiharu-obo
18 - FUKUI-KEN	202 - MATSUMOTO-SHI	461 Mori-machi	345 Haruhi-mura
201 - FUKUI-SHI	215 Shiojiri-shi	482 Fukuda-cho	346 Kiyosu-cho
203 Takefu-shi	441 Akashina-machi	483 Ryuyo-cho	347 Shinkawa-cho
206 Katsuyama-shi	442 Hongo-mura	484 Toyoda-mura	361 Oguchi-cho
207 Sabae-shi	449 Hata-mura	485 Toyooka-mura	362 Fuso-cho
301 Asuwa-cho	461 Toyoshina-machi	501 Kami-mura	363 Iwakura-cho
302 Miyama-cho	462 Hotaka-machi	502 Maisaka-cho	381 Kisogawa-cho
321 Matsuoka-cho	465 Asusagawa-mura	503 Arai-cho	401 Sobue-cho
322 Eihei-cho	466 Misato-mura	505 Yoto-cho	402 Heiwa-cho
361 Mikuni-cho		521 Hosoe-cho	421 Shippo-cho
362 Awara-cho	21 - GIFU-KEN	522 Inasa-cho	422 Miwa-cho
363 Kanazu-cho	201 - GIFU-SHI		423 Jimokuji-chi
364 Maruoka-cho	202 Ogaki-shi	203 - NUMAZU-SHI	424 Oharu-mura
365 Harue-cho	205 Seki-shi	206 Mishima-shi	425 Kanie-cho
366 Sakai-cho	207 Mino-shi	215 Gotenba-shi	426 Jushiyama-mura
421 Asahi-cho	209 Hashima-shi	325 Kannami-cho	428 Yatomi-cho
426 Shimizu-cho	213 Kakamigahara-shi	341 Shimizu-cho	429 Saya-cho
	302 Ginan-cho	342 Nagaizumi-cho	432 Saori-cho
19 - YAMANASHI-KEN	303 Kasamatsu-cho	343 Susono-cho	441 Agui-cho
201 - KOFU-SHI	304 Yanaizu-cho		442 Higashiura-cho
203 Enzan-shi	383 Ampachi-cho	23 - AICHI-KEN	446 Mihama-cho
205 Yamanashi-shi	403 Ono-cho	100 - NAGOYA-SHI	447 Taketoyo-cho
207 Nirasaki-shi	404 Ikeda-cho	203 Ichinomiya-shi	461 Takahama-cho
321 Isawa-cho	421 Kitugata-cho	204 Seto-shi	462 Chiryu-cho
343 Ichikawadaimon-cho	423 Hozumi-cho	205 Handa-shi	204 (21) Tajimi-shi
361 Masuho-cho	424 Sunami-cho	206 Kasugai-shi	232 (21) Nanno-cho
381 Ryuo-cho	425 Shinsei-cho	208 Tsushima-shi	522 (21) Kani-cho
382 Shikishima-cho	426 Itonuki-cho	210 Kariya-shi	205 (24) Kuwana-shi
384 Showa-mura	441 Takatomi-cho	212 Anjo-shi	301 (24) Tado-cho
387 Shirane-machi		215 Inuyama-shi	302 (24) Nagashima-cho
390 Kushigata-machi	22 - SHIZUOKA-KEN	216 Tokoname-shi	
391 Kosai-machi	201 - SHIZUOKA-SHI	217 Konan-shi	201 - TOYOHASHI-SHI
401 Futaba-cho	204 Shimizu-shi	218 Bisai-shi	207 Toyokawa-shi
	209 Shimada-shi	219 Komaki-shi	221 Shinshiro-shi
20 - NAGANO-KEN	212 Yaizu-shi	220 Inazawa-shi	603 Kozakai-cho
201 - NAGANO-SHI	214 Fujieda-shi	222 Tokai-shi	604 Mito-cho
207 Suzaka-shi	402 Oigawa-cho	223 Obu-shi	621 Tahara-cho
216 Koshoku-shi	425 Kanaya-cho	224 Chita-shi	504 (22) Kosai-cho
		301 Toyoake-shi	
		302 Togo-shi	211 - TOYOTA-SHI
		303 Nisshin-shi	202 Okazaki-shi
			521 Miyoshi-cho
			522 Fujioka-mura
			541 Asuke-cho

100 - OSAKA-SHI (continued)	216 Takasago-shi	201 - TOTTORI-SHI (continued)	423 Hayashima-cho
382 Kanan-cho	422 Yumesaki-cho	341 Ketaka-cho	424 Senoo-cho
384 Sayama-cho	441 Kanzaki-cho	343 Aoya-cho	425 Sho-mura
385 Mihara-cho	442 Ichikawa-cho		426 Fukuda-mura
401 Katano-cho	443 Fukusaki-cho	202 - YONAGO-SHI	501 Takamatsu-cho
202 (28) Amagasaki-shi	444 Kodera-cho	204 Sakaiminato-shi	502 Ashimori-cho
204 (28) Nishinomiya-shi	445 Okochi-cho	381 Saihaku-cho	
206 (28) Ashiya-shi	461 Shingu-cho	382 Aimi-cho	202 - KURASHIKI-SHI
207 (28) Itami-shi	462 Ibogawa-cho	383 Kishimoto-cho	427 Yamate-son
214 (28) Takarazuka-shi	463 Mitsu-cho	384 Hiezu-son	428 Kiyone-son
217 (28) Kawanishi-shi	464 Taishi-cho	385 Yodoe-cho	441 Funao-cho
202 (29) Yamatotakada-shi	481 Kamigori-cho	386 Daisen-cho	442 Konko-cho
203 (29) Yamatokoriyama-shi	521 Yamasaki-cho	387 Nawa-cho	443 Kamagata-cho
205 (29) Kashiwara-shi	523 Ichinomiya-cho		444 Yorishima-cho
206 (29) Sakurai-shi			461 Yakage-cho
208 (29) Gose-shi	29 - NARA-KEN	32 - SHIMANE-KEN	503 Mabi-cho
341 (29) Ikoma-shi	201 - NARA-SHI	201 - MATSUE-SHI	
342 (29) Heguri-mura	204 Tenri-shi	208 Hirata-shi	34 - HIROSHIMA-KEN
343 (29) Sango-cho	362 (26) Kizu-cho	301 Kashima-cho	201 - HIROSHIMA-SHI
344 (29) Ikagura-cho	363 (26) Kamo-cho	304 Higashiizumo-cho	301 Aki-cho
363 (29) Tawaramoto-cho	424 (26) Kamaki-mura	305 Yakumo-muro	302 Fuchu-cho
383 (29) Haibara-cho		306 Tamayu-cho	303 Funakoshi-chi
401 (29) Takatori-cho	30 - WAKAYAMA-KEN	307 Shinji-machi	304 Kaita-cho
421 (29) Shinjo-cho	201 - WAKAYAMA-SHI	361 Daito-cho	305 Senogawa-cho
422 (29) Taima-cho	202 Kainan-shi	401 Hikawa-cho	306 Kumanoata-mura
423 (29) Kashiba-cho	204 Arida-shi		307 Kumaano-cho
425 (29) Oji-cho	301 Shimotsu-chi	33 - OKAYAMA-KEN	308 Yano-cho
426 (29) Koryo-cho	321 Uchita-cho	201 - OKAYAMA-SHI	309 Saka-cho
427 (29) Kawai-mura	322 Kokawa-chi	208 Soja-shi	310 Etajima-cho
442 (29) Oyodo-cho	323 Naga-cho	301 Mitsu-cho	311 Ondo-cho
203 (30) Hashimoto-shi	325 Kishigawa-cho	302 Ichinomiya-cho	312 Kurahashi-cho
222 (30) Habikino-shi	326 Iwade-cho	303 Takebe-cho	313 Shimokamagari-cho
362 (30) Tajiri-cho	341 Katsuragi-cho	304 Tsudaka-cho	321 Itsukaichi-cho
		321 Seto-cho	322 Hatsukaichi-cho
28 - HYOGO-KEN		322 Sanyo-cho	323 Ono-cho
100 - KOBE-SHI	31 - TOTTORI-KEN	323 Akasaka-cho	328 Nomi-cho
203 Akashi-shi	201 - TOTTORI-SHI	324 Kumayama-cho	329 Okimi-cho
210 Kakogawa-shi	301 Kokufu-cho	341 Bizen-cho	330 Ogaki-cho
215 Miki-shi	302 Iwami-cho	346 Wake-cho	341 Gion-cho
219 Sanda-shi	303 Fukube-son	361 Ushimado-cho	342 Yasufuruichi-cho
381 Inami-cho	321 Koge-cho	362 Oku-cho	343 Sato-cho
382 Harima-cho	322 Funaoka-cho	363 Osafune-cho	344 Numata-cho
682 Awaji-cho	323 Kawahara-cho	381 Joto-cho	345 Asa-cho
	324 Hatto-cho	401 Nadasaki-cho	346 Kabe-cho
201 - HIMEJI-SHI	326 Mochigase-cho	402 Kojo-son	347 Koyo-cho
208 Aioi-shi		421 Kibi-cho	386 Mukaihara-cho
211 Tastuno-shi			387 Shiraki-chi
212 Ako-shi			401 Saijo-cho

201.- HIROSHIMA-SHI (continued)	341 Ishii-cho	205 - NIHAMA-SHI	342 Sasaguri-machi
402 Kurose-cho	401 Matsushigo-cho	206 Saijo-shi	343 Shime-machi
403 Hachihonmatsu-cho	402 Kitajima-cho	302 Doi-cho	344 Sue-machi
409 Takayalcho	403 Aizumi-cho		345 Shingu-machi
	404 Itano-cho		346 Shika-machi
	405 Kamiita-cho	39 - KOCHI-KEN	347 Koga-machi
207 - FUKUYAMA-SHI	441 Kamojima-cho		348 Hisayama-machi
205 Onomichi-shi	442 Kawashima-cho	201 - KOCHI-SHI	349 Kasuya-machi
482 Numakuma-cho	443 Yamakawa-cho	204 Nankoku-shi	362 Fukuma-machi
501 Kannabe-cho		323 Tosayamada-cho	363 Tsuyazaki-machi
502 Kamo-cho	37 - KAGAWA-Ken	324 Noichi-cho	443 Miwa-machi
523 Ekiya-cho	201 - TAKAMATSU-SHI	342 Otsu-mura	461 Maebaru-machi
524 Shinichi-cho	202 Marugame-shi	343 Kera-mura	462 Niyo-machi
205 (33) Kasaoka-shi	203 Sakaide-shi	381 Ino-cho	502 Ogori-machi
207 (33) Ibara-shi	303 Ouchi-cho	402 Sakawa-cho	203 (41) Tosu-shi
	304 Tsuda-cho	410 Hidaka-mura	341 (41) Kiyama-cho
	306 Shido-cho		
35 - YAMAGUCHI-KEN	307 Sangawa-cho	40 - FUKUOKA-KEN	202 - OMTA-SHI
201 - SHIMONOSEKI-SHI	308 Nagao-cho	100 - KITAKYUSHU-SHI	581 Takata-machi
422 Sanyo-cho	341 Miki-cho	204 Nagata-shi	204 (43) Arao-shi
441 Kikugawa-cho	342 Mure-cho	206 Tagawa-shi	368 (43) Nagasu-machi
443 Toyoura-cho	343 Aji-cho	213 Yukuhashi-shi	
444 Hohoku-cho	362 Kagawa-cho	214 Buzen-shi	203 - KURUME-SHI
	381 Ayakami-cho	215 Nakama-shi	210 Yame-shi
202 - UBE-SHI	382 Ryonan-cho	361 Munakata-machi	211 Chikugo-shi
209 Onoda-shi	383 Kokubunji-cho	381 Ashiya-machi	481 Yoshii-machi
403 Ajisu-cho	384 Ayauta-cho	382 Mizumaki-machi	482 Tanushimaru-machi
421 Kusunoki-cho	385 Hanzan-cho	383 Okagaki-machi	483 Ukiha-machi
	386 Utazu-cho	384 Ouga-machi	501 Kitano-machi
	404 Tadotsu-cho	402 Kurate-machi	521 Jojima-machi
		601 Kawara-machi	522 Oki-machi
203 - YAMAGUCHI-SHI	38 - EHIME-KEN	605 Kawasaki-machi	523 Mizuma-machi
402 Ogori-cho	201 - MATSUYAMA-SHI	621 Kanda-machi	544 Hirokawa-machi
	210 Iyo-shi	622 Saigawa-machi	561 Setaka-machi
208 - IWAKUNI-SHI	211 Hojo-shi	624 Toyotsu-machi	343 (41) Kitashigeyasu-cho
322 Yuu-cho	361 Shigenobu-sho	641 Shida-machi	433 (41) Mine-cho
323 Kuga-cho	401 Masaki-cho	643 Tsuiki-machi	
325 Shuto-cho	402 Tobe-cho		41 - SAGA-KEN
211 (34) Otake-shi		201 - FUKUOKA-SHI	201 - SAGA-SHI
	202 - IMABARI-SHI	209 Amagi-shi	204 Taku-shi
36 - TAKUSHIMA-KEN	322 Nyugawa-cho	301 Chikushino-machi	301 Morodomi-cho
201 - TOKUSHIMA-SHI	324 Miyoshi-cho	302 Dazaifu-machi	304 Kubota-cho
202 Naruto-shi	343 Namikata-cho	304 Ono-machi	305 Yamato-cho
203 Komatsushima-shi	344 Onishi-cho	305 Nakagawa-machi	321 Kanzaki-machi
	345 Kikuma-cho	321 Sawara-machi	322 Chiyoda-cho
		341 Umi-machi	

201 - SAGA-SHI (continued) 45 - MIYAZAKI-KEN
361 Ogi-machi
362 Mikatsuki-cho

42 - NAGASAKI-KEN
201 - NAGASAKI-SHI
204 Isahaya-shi
301 Koyagi-cho
304 Nomozaki-cho
305 Sanwa-cho
306 Tarami-cho
307 Nagayo-cho
308 Togitsu-cho

202 - SASEBO-SHI
322 Kawatana-cho
391 Saza-cho

43 - KUMAMOTO-KEN
201 - KUMAMOTO-SHI
211 Uto-shi
303 Akita-mura
342 Tomiai-mura
343 Matsubase-machi
407 Nishigoshi-machi

202 - YATSUSHIRO-SHI
461 Sakamoto-mura
462 Sencho-mura
463 Kagami-machi

44 - OITA-KEN
201 - OITA-SHI
202 Beppu-shi
206 Usuki-shi
381 Saganoseki-machi

201 - MIYAZAKI-SHI
303 Sadowara-cho

203 - NOBEOKA-SHI
421 Kadogawa-cho

46 - KAGOSHIMA-KEN
201 - KAGOSHIMA-SHI
363 Ijuin-cho
441 Kajiki-cho

APPENDIX 2

VARIABLES IN REGIONAL DATA BANK

Variables Available for 1970

<u>Variable Number</u>	<u>Variable Name</u>
1	Population, all ages ¹
2	Population, Percent by age 0~14 years old
3	Population, Percent by age 15~64 years old
4	Number of Quasi-household members
5	Percent of persons who have completed Junior college or University
6	Total labor force ²
7	Total employment ²
8	Percent distribution by industry, Primary industries, Total ²
9	Percent distribution by industry, Primary industries, Agriculture ²
10	Percent distribution by industry, Secondary industries, Total ²
11	Percent distribution by industry, Secondary industries, Manufacturing ²
12	Population 15 years old and over by level of education, Total
13	Percent distribution by industry, Wholesale and Retail Trade ²
14	Percent distribution by industry, Services ²
15	Percent distribution by industry, Government ²
16	Employed persons 15 years and over by occupation, percent by occupation, Professional and Technical Workers and Managers and Officials and Clerical and related workers ²
17	Percent by tenure of house, Owned house
18	Number of Quasi-households
19	Rooms per household (ordinary household)
20	Tatami per household (ordinary household)
21	Percent by economic type of ordinary households, Agricultural workers' households

- 22 Percent by economic type of ordinary households, Agricultural and non-agricultural workers, mixed households
- 23 Non-agricultural workers' households, Total
- 24 Employed persons 15 years old and over by employment status, %, Family workers
Population by time of last move, locality of previous residence
- 25 Lived in same residence since birth
- 26 Lived in same residence from 1959 or before
- 27 Lived in same residence from 1960 to 1964
- 28 Lived in same residence from January, 1965
^September, 1969, Total
- 29 Lived in same residence from January, 1965
^September, 1969, Same shi, ku, machi and mura
- 30 Lived in same residence from January, 1965
^September, 1969, Different ku of the same shi
- 31 Lived in same residence from January, 1965
^September, 1969, Other prefecture
- 32 Deaths, Total
- 33 Deaths, Male
- 34 Ischemic heart disease, Total
- 35 Ischemic heart disease, Male
- 36 Wholesale Industry, number of stores,
- 37 Wholesale Industry, number of employees
- 38 Wholesale Industry, total annual sales
- 39 Retail trade, number of stores
- 40 Retail trade, number of employees
- 41 Retail trade, Total annual sales
- 42 Number of manufacturing employees (by place of work)
- 43 Number of Wholesale and Retail trade employees (by place of work)
- 44 Number of Service employees (by place of work)

Variables Available for 1960

<u>Variable numbers</u>	<u>Variable Names</u>
1	Population by sex, Males per 100 females
2	Ordinary households, Total
3	Ordinary households, Persons per household
4	Industry of employed persons 15 years old and over, Agriculture
5	Industry of employed persons 15 years old and over, Manufacturing
6	Industry of employed persons 15 years old and over, Wholesale and Retail trade
7	Industry of employed persons 15 years old and over, Services
8	Industry of employed persons 15 years old and over, Government
9	Population, All ages
10	Population, Percent by age, 0~14 years old
11	Population, Percent by age, 15~64 years old
12	Labor force, Total
13	Number of Unemployed
14	Percent by industry, Primary industry
15	Percent by industry, Secondary industry
16	Employed persons 15 years old and over by occupation, Professional and Technical workers and Managers and Officials and Clerical and related workers
17	Industry by employed persons 15 years old and over, by place of work, Total
18	Industry by employed persons 15 years old and over, by place of work, Living in other <u>shi</u> , <u>machi</u> , <u>mura</u>

URBAN INFRASTRUCTURE AND LOCAL GOVERNMENT EXPENDITURE

Variables Available for 1971

<u>Variable Number</u>	<u>Variable Name</u>
1	Area of roads
2	Number of libraries (Shi-cho-son libraries)
3	Number of libraries (<u>non</u> Shi-cho-son libraries)
4	Area of cultivated field
5	Number of sea ports (exceptionally important)
6	Number of sea ports (important)
7	Number of sea ports (local)
8	Percent of paved roads
9	Area of parks (within city planning areas)
10	Area of parks (within local government boundary)
11	Number of public apartments for 100 households
12	Diffusion rate of water supply facilities
13	Diffusion rate of drainage facilities
14	Excrements collection ratio
15	Garbage collection ratio
16	Local government expenditures (LGE) on LG assembly
17	Local government expenditures on general affairs
18	Local government expenditures on general welfare
19	Local government expenditures on welfare for the aged
20	Local government expenditures on welfare for children
21	Local government expenditures on sanitation
22	Local government expenditures on cleaning and sweeping
23	Local government expenditures on labor
24	Local government expenditures on the activities relating to agriculture, forestry and fishing industries
25	Local government expenditures on the activities relating to commerce and industry
26	Local government expenditures on civil engineering works (general)
27	Local government expenditures on the construction of roads and bridge

28	Local government expenditures on city planning activities
29	Local government expenditures on housing
30	Local government expenditures on fire service
31	Local government expenditures on education
32	Local government expenditures local bonds
33	Total local government expenditures
34	Area of forest and woods
35	Number of books stocked in shi-cho-son libraries ³
36	Number of books stocked in <u>non</u> shi-cho-son libraries ³
37	Registered population
38	Population in city planning areas
39	Annual collection of excrements
40	Annual collection of garbage

Footnotes to Appendix 2

The data are available for the date noted in the text of Appendix 2 and for the following additional years.

1. 1950, 1955 1965, 1975
2. 1960, 1965
3. 1972 not 1971

APPENDIX 3

Population and Employment Distribution for Individual RECs,
1960-1970

	1960	1970	% CHANGE 1960-1970
SAPPORO			
POPULATION (1000'S)	876.177	1106.368	26.215
TOTAL EMPLOYMENT (1000'S)	370.424	608.418	64.249
% PRIMARY EMPLOYMENT	9.069	3.626	-60.013
% SECONDARY EMPLOYMENT	26.097	26.325	3.026
% WHOLESALE & RETAIL EMPLOYMENT	24.889	28.616	14.978
% SERVICES EMPLOYMENT	17.355	20.237	16.619
% OTHER TERTIARY EMPLOYMENT	13.808	14.308	3.623
% GOVERNMENT EMPLOYMENT	6.785	6.328	-27.962
HAKODATE			
POPULATION (1000'S)	312.494	334.076	6.906
TOTAL EMPLOYMENT (1000'S)	121.837	151.864	24.662
% PRIMARY EMPLOYMENT	15.613	8.520	-45.431
% SECONDARY EMPLOYMENT	28.151	26.455	-6.025
% WHOLESALE & RETAIL EMPLOYMENT	21.579	25.153	16.565
% SERVICES EMPLOYMENT	15.449	19.631	27.064
% OTHER TERTIARY EMPLOYMENT	14.912	15.220	2.068
% GOVERNMENT EMPLOYMENT	4.296	5.021	16.879
HURUGAN			
POPULATION (1000'S)	201.221	238.137	18.346
TOTAL EMPLOYMENT (1000'S)	78.916	104.751	32.737
% PRIMARY EMPLOYMENT	8.771	4.869	-44.486
% SECONDARY EMPLOYMENT	39.655	35.510	-10.453
% WHOLESALE & RETAIL EMPLOYMENT	17.127	21.507	25.576
% SERVICES EMPLOYMENT	15.669	18.420	17.561
% OTHER TERTIARY EMPLOYMENT	15.330	16.268	6.117
% GOVERNMENT EMPLOYMENT	3.448	3.425	-0.670
KUSHIRO			
POPULATION (1000'S)	171.394	207.430	21.025
TOTAL EMPLOYMENT (1000'S)	66.514	92.859	39.608
% PRIMARY EMPLOYMENT	9.108	6.191	-32.021
% SECONDARY EMPLOYMENT	36.728	30.308	-17.481
% WHOLESALE & RETAIL EMPLOYMENT	21.389	25.540	19.403
% SERVICES EMPLOYMENT	13.283	17.821	34.164
% OTHER TERTIARY EMPLOYMENT	15.422	16.026	3.915
% GOVERNMENT EMPLOYMENT	4.070	4.115	1.104
MORIOKA			
POPULATION (1000'S)	171.838	212.690	23.774
TOTAL EMPLOYMENT (1000'S)	73.999	102.684	38.764
% PRIMARY EMPLOYMENT	22.150	11.890	-46.322
% SECONDARY EMPLOYMENT	17.294	18.746	8.396
% WHOLESALE & RETAIL EMPLOYMENT	22.210	26.382	18.786
% SERVICES EMPLOYMENT	19.192	23.419	22.022
% OTHER TERTIARY EMPLOYMENT	13.443	13.873	3.195
% GOVERNMENT EMPLOYMENT	5.711	5.691	-0.348
SENDAI			
POPULATION (1000'S)	794.739	956.876	20.401
TOTAL EMPLOYMENT (1000'S)	337.504	457.663	35.602
% PRIMARY EMPLOYMENT	27.905	15.367	-44.930
% SECONDARY EMPLOYMENT	20.131	24.608	22.243
% WHOLESALE & RETAIL EMPLOYMENT	19.777	24.553	24.148
% SERVICES EMPLOYMENT	14.776	17.809	20.527
% OTHER TERTIARY EMPLOYMENT	10.771	12.171	12.998
% GOVERNMENT EMPLOYMENT	6.641	5.492	-17.300

Appendix 3 (continued)
 Population and Employment Distribution for Individual RECs
 1960-1970

	1960	1970	% CHANGE 1960-1970
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ISHIMAKI			
POPULATION (1000'S)	132.616	144.803	9.190
TOTAL EMPLOYMENT (1000'S)	56.829	68.224	20.051
% PRIMARY EMPLOYMENT	34.144	26.168	-23.362
% SECONDARY EMPLOYMENT	25.088	27.798	10.803
% WHOLESALE & RETAIL EMPLOYMENT	18.784	19.816	5.492
% SERVICES EMPLOYMENT	10.878	12.891	18.503
% OTHER TERTIARY EMPLOYMENT	6.563	8.835	34.612
% GOVERNMENT EMPLOYMENT	4.542	4.492	-1.092
AKITA			
POPULATION (1000'S)	361.143	383.175	6.101
TOTAL EMPLOYMENT (1000'S)	154.556	185.488	20.013
% PRIMARY EMPLOYMENT	37.617	22.882	-39.171
% SECONDARY EMPLOYMENT	19.347	22.450	16.041
% WHOLESALE & RETAIL EMPLOYMENT	15.220	20.810	36.730
% SERVICES EMPLOYMENT	12.672	16.950	33.751
% OTHER TERTIARY EMPLOYMENT	10.067	12.000	19.210
% GOVERNMENT EMPLOYMENT	5.078	4.908	-3.339
YAMAGATA			
POPULATION (1000'S)	383.092	391.335	2.152
TOTAL EMPLOYMENT (1000'S)	185.754	208.756	12.383
% PRIMARY EMPLOYMENT	44.435	27.937	-37.129
% SECONDARY EMPLOYMENT	16.743	26.510	41.440
% WHOLESALE & RETAIL EMPLOYMENT	14.532	18.352	26.289
% SERVICES EMPLOYMENT	11.473	14.866	29.569
% OTHER TERTIARY EMPLOYMENT	5.860	7.582	29.388
% GOVERNMENT EMPLOYMENT	4.958	4.754	-4.112
FUKUSHIMA			
POPULATION (1000'S)	306.985	327.032	6.530
TOTAL EMPLOYMENT (1000'S)	143.103	169.456	18.415
% PRIMARY EMPLOYMENT	40.577	25.332	-37.571
% SECONDARY EMPLOYMENT	20.467	27.653	35.111
% WHOLESALE & RETAIL EMPLOYMENT	14.642	17.712	20.970
% SERVICES EMPLOYMENT	12.763	16.022	25.537
% OTHER TERTIARY EMPLOYMENT	7.175	8.450	17.772
% GOVERNMENT EMPLOYMENT	4.377	4.831	10.374
AIZUWAKAMATSU			
POPULATION (1000'S)	119.252	120.641	1.165
TOTAL EMPLOYMENT (1000'S)	52.199	61.491	17.801
% PRIMARY EMPLOYMENT	29.759	18.618	-37.437
% SECONDARY EMPLOYMENT	24.358	30.515	25.277
% WHOLESALE & RETAIL EMPLOYMENT	20.234	21.796	7.718
% SERVICES EMPLOYMENT	14.926	17.140	14.634
% OTHER TERTIARY EMPLOYMENT	8.263	9.352	13.178
% GOVERNMENT EMPLOYMENT	2.460	2.579	4.845
KORIYAMA			
POPULATION (1000'S)	309.223	332.688	7.588
TOTAL EMPLOYMENT (1000'S)	140.304	167.850	19.633
% PRIMARY EMPLOYMENT	45.012	29.229	-35.064
% SECONDARY EMPLOYMENT	19.465	27.021	38.813
% WHOLESALE & RETAIL EMPLOYMENT	14.446	18.359	27.088
% SERVICES EMPLOYMENT	10.905	13.894	27.415
% OTHER TERTIARY EMPLOYMENT	7.191	8.599	19.572
% GOVERNMENT EMPLOYMENT	2.980	2.898	-2.755

Appendix 3 (continued)

Population and Employment Distribution for Individual RECs,
1960-1970

MITO	1960	1970	% CHANGE 1960-1970
POPULATION (1000'S)	358.708	413.508	15.277
TOTAL EMPLOYMENT (1000'S)	169.505	205.161	21.754
% PRIMARY EMPLOYMENT	41.329	23.766	-42.496
% SECONDARY EMPLOYMENT	19.584	27.836	42.134
% WHOLESALE & RETAIL EMPLOYMENT	15.494	19.225	24.078
% SERVICES EMPLOYMENT	11.845	15.738	32.861
% OTHER TERTIARY EMPLOYMENT	6.887	9.051	31.425
% GOVERNMENT EMPLOYMENT	4.860	4.384	-9.791
HITACHI			
POPULATION (1000'S)	318.134	335.157	5.351
TOTAL EMPLOYMENT (1000'S)	146.354	164.662	12.509
% PRIMARY EMPLOYMENT	24.202	14.420	-40.416
% SECONDARY EMPLOYMENT	47.934	49.680	3.642
% WHOLESALE & RETAIL EMPLOYMENT	11.144	14.082	26.358
% SERVICES EMPLOYMENT	10.281	12.904	25.522
% OTHER TERTIARY EMPLOYMENT	4.745	6.795	43.215
% GOVERNMENT EMPLOYMENT	1.695	2.119	25.035
UTSUNOMIYA			
POPULATION (1000'S)	518.732	583.470	12.480
TOTAL EMPLOYMENT (1000'S)	237.668	300.227	26.216
% PRIMARY EMPLOYMENT	40.309	23.975	-40.523
% SECONDARY EMPLOYMENT	21.575	31.719	47.016
% WHOLESALE & RETAIL EMPLOYMENT	16.892	19.389	14.784
% SERVICES EMPLOYMENT	11.034	13.623	23.462
% OTHER TERTIARY EMPLOYMENT	6.021	7.328	21.709
% GOVERNMENT EMPLOYMENT	4.169	3.967	-4.849
MAEBASHI			
POPULATION (1000'S)	265.816	305.469	14.925
TOTAL EMPLOYMENT (1000'S)	122.638	157.499	28.426
% PRIMARY EMPLOYMENT	33.592	19.466	-42.053
% SECONDARY EMPLOYMENT	25.286	31.307	23.812
% WHOLESALE & RETAIL EMPLOYMENT	17.063	20.638	20.948
% SERVICES EMPLOYMENT	13.436	16.368	21.821
% OTHER TERTIARY EMPLOYMENT	6.644	8.368	25.963
% GOVERNMENT EMPLOYMENT	3.979	3.854	-3.158
TAKASAKI			
POPULATION (1000'S)	353.262	391.387	10.792
TOTAL EMPLOYMENT (1000'S)	165.718	204.868	23.624
% PRIMARY EMPLOYMENT	41.116	24.525	-40.353
% SECONDARY EMPLOYMENT	24.406	33.446	37.042
% WHOLESALE & RETAIL EMPLOYMENT	14.202	18.309	28.918
% SERVICES EMPLOYMENT	9.726	12.209	25.538
% OTHER TERTIARY EMPLOYMENT	7.991	8.941	11.888
% GOVERNMENT EMPLOYMENT	2.560	2.571	0.421
KIRYU			
POPULATION (1000'S)	149.404	162.296	8.629
TOTAL EMPLOYMENT (1000'S)	73.080	89.413	22.349
% PRIMARY EMPLOYMENT	13.300	6.992	-47.432
% SECONDARY EMPLOYMENT	53.081	56.104	5.696
% WHOLESALE & RETAIL EMPLOYMENT	16.961	18.085	6.626
% SERVICES EMPLOYMENT	10.739	11.824	10.107
% OTHER TERTIARY EMPLOYMENT	4.425	5.530	24.980
% GOVERNMENT EMPLOYMENT	1.494	1.465	-1.980

Appendix 3 (continued)
 Population and Employment Distribution for Individual RECs,
 1960-1970

	1960 ----	1970 ----	% CHANGE 1960-1970 -----
KUMAGAYA			
POPULATION (1000'S)	259.595	289.544	11.537
TOTAL EMPLOYMENT (1000'S)	127.917	154.319	20.640
% PRIMARY EMPLOYMENT	48.682	29.494	-39.415
% SECONDARY EMPLOYMENT	21.178	31.863	50.451
% WHOLESALE & RETAIL EMPLOYMENT	12.625	16.153	27.943
% SERVICES EMPLOYMENT	8.834	10.899	23.380
% OTHER TERTIARY EMPLOYMENT	5.577	7.963	42.770
% GOVERNMENT EMPLOYMENT	3.104	3.628	16.898
CHIBA			
POPULATION (1000'S)	519.621	816.025	57.042
TOTAL EMPLOYMENT (1000'S)	247.660	393.921	59.057
% PRIMARY EMPLOYMENT	40.283	16.728	-58.474
% SECONDARY EMPLOYMENT	22.348	35.144	57.254
% WHOLESALE & RETAIL EMPLOYMENT	13.392	18.370	37.171
% SERVICES EMPLOYMENT	10.710	14.439	34.819
% OTHER TERTIARY EMPLOYMENT	9.263	10.875	17.393
% GOVERNMENT EMPLOYMENT	4.003	4.444	11.031
YOKOHAMA			
POPULATION (1000'S)	13099.351	17711.518	35.209
TOTAL EMPLOYMENT (1000'S)	6136.391	8726.403	42.207
% PRIMARY EMPLOYMENT	6.113	3.860	-52.415
% SECONDARY EMPLOYMENT	41.322	40.493	-2.007
% WHOLESALE & RETAIL EMPLOYMENT	21.915	24.056	9.770
% SERVICES EMPLOYMENT	15.600	16.808	7.747
% OTHER TERTIARY EMPLOYMENT	9.646	11.519	19.414
% GOVERNMENT EMPLOYMENT	3.404	3.263	-4.133
YOKOHAMA			
POPULATION (1000'S)	2076.641	3323.751	60.039
TOTAL EMPLOYMENT (1000'S)	899.511	1572.277	74.792
% PRIMARY EMPLOYMENT	6.608	2.391	-63.815
% SECONDARY EMPLOYMENT	40.442	43.556	7.702
% WHOLESALE & RETAIL EMPLOYMENT	19.440	20.192	3.866
% SERVICES EMPLOYMENT	16.371	16.143	-1.389
% OTHER TERTIARY EMPLOYMENT	12.395	13.798	11.317
% GOVERNMENT EMPLOYMENT	4.744	3.919	-17.384
HIRATSUKA			
POPULATION (1000'S)	155.728	234.421	50.532
TOTAL EMPLOYMENT (1000'S)	66.519	111.650	67.847
% PRIMARY EMPLOYMENT	17.775	8.181	-53.975
% SECONDARY EMPLOYMENT	32.517	45.698	18.643
% WHOLESALE & RETAIL EMPLOYMENT	17.412	18.370	5.503
% SERVICES EMPLOYMENT	13.930	14.828	6.448
% OTHER TERTIARY EMPLOYMENT	9.278	10.056	8.387
% GOVERNMENT EMPLOYMENT	3.088	2.867	-7.161
ODAWARA			
POPULATION (1000'S)	233.572	283.736	21.477
TOTAL EMPLOYMENT (1000'S)	106.721	144.337	35.247
% PRIMARY EMPLOYMENT	17.285	10.831	-37.339
% SECONDARY EMPLOYMENT	35.341	36.935	4.512
% WHOLESALE & RETAIL EMPLOYMENT	15.455	33.918	119.459
% SERVICES EMPLOYMENT	19.286	20.051	3.966
% OTHER TERTIARY EMPLOYMENT	10.270	4.206	-58.711
% GOVERNMENT EMPLOYMENT	2.363	2.471	4.580

Appendix 3 (continued)
Population and Employment Distribution for Individual RECs,
1960-1970

	1960	1970	% CHANGE 1960-1970
NIIGATA			
POPULATION (1000'S)	634.379	691.590	9.018
TOTAL EMPLOYMENT (1000'S)	293.399	356.329	21.449
% PRIMARY EMPLOYMENT	32.639	19.486	-40.299
% SECONDARY EMPLOYMENT	23.483	25.340	7.907
% WHOLESALE & RETAIL EMPLOYMENT	18.146	22.605	24.576
% SERVICES EMPLOYMENT	12.376	16.526	33.508
% OTHER TERTIARY EMPLOYMENT	9.645	11.903	23.404
% GOVERNMENT EMPLOYMENT	3.709	4.141	11.652
NAGAOKA			
POPULATION (1000'S)	212.790	224.121	5.325
TOTAL EMPLOYMENT (1000'S)	105.305	122.514	16.342
% PRIMARY EMPLOYMENT	36.487	22.310	-38.855
% SECONDARY EMPLOYMENT	27.079	32.791	21.091
% WHOLESALE & RETAIL EMPLOYMENT	16.946	20.902	23.344
% SERVICES EMPLOYMENT	10.746	13.859	28.946
% OTHER TERTIARY EMPLOYMENT	6.837	8.191	19.812
% GOVERNMENT EMPLOYMENT	1.905	1.947	2.331
TOYAMA			
POPULATION (1000'S)	477.794	493.522	3.292
TOTAL EMPLOYMENT (1000'S)	240.429	268.957	11.865
% PRIMARY EMPLOYMENT	33.237	21.825	-34.336
% SECONDARY EMPLOYMENT	30.453	33.079	8.621
% WHOLESALE & RETAIL EMPLOYMENT	16.207	19.384	19.601
% SERVICES EMPLOYMENT	18.417	14.025	-34.632
% OTHER TERTIARY EMPLOYMENT	7.045	8.820	25.195
% GOVERNMENT EMPLOYMENT	2.641	2.868	8.612
TAKAOKA			
POPULATION (1000'S)	367.534	364.085	-0.938
TOTAL EMPLOYMENT (1000'S)	183.655	203.247	10.668
% PRIMARY EMPLOYMENT	39.355	23.871	-39.343
% SECONDARY EMPLOYMENT	27.869	36.598	31.322
% WHOLESALE & RETAIL EMPLOYMENT	14.571	16.865	15.741
% SERVICES EMPLOYMENT	10.019	12.612	25.878
% OTHER TERTIARY EMPLOYMENT	6.129	7.560	23.332
% GOVERNMENT EMPLOYMENT	2.056	2.494	21.289
KANAZAWA			
POPULATION (1000'S)	482.871	540.268	11.887
TOTAL EMPLOYMENT (1000'S)	235.953	284.572	20.605
% PRIMARY EMPLOYMENT	26.750	14.139	-47.144
% SECONDARY EMPLOYMENT	31.053	34.422	10.851
% WHOLESALE & RETAIL EMPLOYMENT	17.127	21.614	26.199
% SERVICES EMPLOYMENT	12.739	16.233	27.420
% OTHER TERTIARY EMPLOYMENT	9.055	10.265	13.360
% GOVERNMENT EMPLOYMENT	3.276	3.327	1.567
FUKUI			
POPULATION (1000'S)	485.114	499.568	2.980
TOTAL EMPLOYMENT (1000'S)	253.626	281.020	10.801
% PRIMARY EMPLOYMENT	35.162	21.101	-39.989
% SECONDARY EMPLOYMENT	31.406	37.481	19.337
% WHOLESALE & RETAIL EMPLOYMENT	14.430	17.431	20.804
% SERVICES EMPLOYMENT	10.060	13.558	34.768
% OTHER TERTIARY EMPLOYMENT	6.390	7.569	18.442
% GOVERNMENT EMPLOYMENT	2.549	2.859	12.147

Appendix 3 (continued)

Population and Employment Distribution for Individual REC's,
1960-1970

	1960	1970	% CHANGE 1960-1970
KOFU			
POPULATION (1000'S)	360.450	377.933	4.850
TOTAL EMPLOYMENT (1000'S)	169.309	195.194	15.289
% PRIMARY EMPLOYMENT	36.502	23.722	-34.820
% SECONDARY EMPLOYMENT	24.257	30.234	24.638
% WHOLESALE & RETAIL EMPLOYMENT	17.274	20.132	16.545
% SERVICES EMPLOYMENT	12.153	14.782	21.632
% OTHER TERTIARY EMPLOYMENT	6.477	7.757	19.757
% GOVERNMENT EMPLOYMENT	3.337	3.304	-0.982
NAGANO			
POPULATION (1000'S)	382.416	411.616	7.636
TOTAL EMPLOYMENT (1000'S)	188.750	222.949	16.119
% PRIMARY EMPLOYMENT	38.420	24.005	-37.518
% SECONDARY EMPLOYMENT	21.623	29.570	36.741
% WHOLESALE & RETAIL EMPLOYMENT	15.463	18.155	17.409
% SERVICES EMPLOYMENT	11.455	14.287	24.935
% OTHER TERTIARY EMPLOYMENT	9.057	10.190	12.508
% GOVERNMENT EMPLOYMENT	4.000	3.793	-5.174
MATSUMATO			
POPULATION (1000'S)	274.044	294.184	7.349
TOTAL EMPLOYMENT (1000'S)	141.266	166.824	18.075
% PRIMARY EMPLOYMENT	41.132	26.007	-36.772
% SECONDARY EMPLOYMENT	23.141	31.332	35.396
% WHOLESALE & RETAIL EMPLOYMENT	14.942	18.613	24.565
% SERVICES EMPLOYMENT	11.412	13.852	21.375
% OTHER TERTIARY EMPLOYMENT	6.506	7.345	12.854
% GOVERNMENT EMPLOYMENT	2.865	2.853	-0.439
GIFU			
POPULATION (1000'S)	620.691	749.594	20.768
TOTAL EMPLOYMENT (1000'S)	310.384	403.231	29.914
% PRIMARY EMPLOYMENT	24.610	13.169	-46.491
% SECONDARY EMPLOYMENT	37.688	44.341	17.652
% WHOLESALE & RETAIL EMPLOYMENT	17.028	19.133	12.367
% SERVICES EMPLOYMENT	11.013	12.929	17.395
% OTHER TERTIARY EMPLOYMENT	6.121	7.380	20.579
% GOVERNMENT EMPLOYMENT	3.540	3.048	-13.913
SHIZUOKA			
POPULATION (1000'S)	793.848	927.563	16.844
TOTAL EMPLOYMENT (1000'S)	366.115	476.629	30.186
% PRIMARY EMPLOYMENT	24.195	14.529	-39.952
% SECONDARY EMPLOYMENT	35.735	38.096	6.607
% WHOLESALE & RETAIL EMPLOYMENT	18.108	21.581	19.182
% SERVICES EMPLOYMENT	11.593	13.605	17.357
% OTHER TERTIARY EMPLOYMENT	7.720	9.767	26.504
% GOVERNMENT EMPLOYMENT	2.649	2.423	-8.552
HAMAMATSU			
POPULATION (1000'S)	743.710	827.403	11.253
TOTAL EMPLOYMENT (1000'S)	366.424	449.537	22.682
% PRIMARY EMPLOYMENT	31.660	18.057	-42.966
% SECONDARY EMPLOYMENT	35.386	43.870	23.975
% WHOLESALE & RETAIL EMPLOYMENT	14.327	16.647	16.193
% SERVICES EMPLOYMENT	9.715	11.999	23.517
% OTHER TERTIARY EMPLOYMENT	5.982	7.046	17.794
% GOVERNMENT EMPLOYMENT	2.930	2.380	-18.762

Appendix 3 (continued)

Population and Employment Distribution for Individual RECs,
1960-1970

	1960	1970	% CHANGE 1960-1970
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NUMAZU			
POPULATION (1000'S)	330.876	421.513	27.392
TOTAL EMPLOYMENT (1000'S)	149.364	209.623	40.325
% PRIMARY EMPLOYMENT	23.086	11.174	-51.600
% SECONDARY EMPLOYMENT	33.416	39.736	18.906
% WHOLESALE & RETAIL EMPLOYMENT	17.082	20.073	17.506
% SERVICES EMPLOYMENT	12.434	14.389	15.722
% OTHER TERTIARY EMPLOYMENT	9.466	10.297	8.761
% GOVERNMENT EMPLOYMENT	4.512	4.331	-4.000
NAGoya			
POPULATION (1000'S)	3267.621	4122.595	26.165
TOTAL EMPLOYMENT (1000'S)	1646.750	2190.774	33.036
% PRIMARY EMPLOYMENT	13.139	6.829	-48.029
% SECONDARY EMPLOYMENT	47.746	46.338	-2.950
% WHOLESALE & RETAIL EMPLOYMENT	17.764	21.870	23.118
% SERVICES EMPLOYMENT	10.182	12.893	26.619
% OTHER TERTIARY EMPLOYMENT	9.013	9.927	10.144
% GOVERNMENT EMPLOYMENT	2.156	2.144	-0.558
TOYCHASHI			
POPULATION (1000'S)	380.991	375.187	-1.523
TOTAL EMPLOYMENT (1000'S)	191.063	242.621	26.985
% PRIMARY EMPLOYMENT	31.967	19.436	-39.199
% SECONDARY EMPLOYMENT	32.141	38.737	20.522
% WHOLESALE & RETAIL EMPLOYMENT	15.757	18.146	15.163
% SERVICES EMPLOYMENT	11.054	13.238	19.753
% OTHER TERTIARY EMPLOYMENT	6.052	7.786	28.664
% GOVERNMENT EMPLOYMENT	3.029	2.657	-12.308
TOYOTA			
POPULATION (1000'S)	311.142	445.103	43.055
TOTAL EMPLOYMENT (1000'S)	158.259	245.133	54.894
% PRIMARY EMPLOYMENT	29.417	12.386	-57.895
% SECONDARY EMPLOYMENT	38.425	54.013	40.567
% WHOLESALE & RETAIL EMPLOYMENT	12.476	14.087	12.892
% SERVICES EMPLOYMENT	9.625	11.076	15.067
% OTHER TERTIARY EMPLOYMENT	8.059	6.481	-19.581
% GOVERNMENT EMPLOYMENT	1.995	1.957	-1.896
TSU			
POPULATION (1000'S)	291.021	312.070	7.233
TOTAL EMPLOYMENT (1000'S)	139.990	159.964	14.268
% PRIMARY EMPLOYMENT	35.905	22.686	-36.817
% SECONDARY EMPLOYMENT	24.253	29.514	21.691
% WHOLESALE & RETAIL EMPLOYMENT	15.823	18.330	15.849
% SERVICES EMPLOYMENT	12.582	15.663	24.493
% OTHER TERTIARY EMPLOYMENT	7.285	8.855	21.553
% GOVERNMENT EMPLOYMENT	4.152	4.951	19.243
YOKKAICHI			
POPULATION (1000'S)	384.347	453.344	17.952
TOTAL EMPLOYMENT (1000'S)	195.477	237.783	21.642
% PRIMARY EMPLOYMENT	32.572	18.468	-43.302
% SECONDARY EMPLOYMENT	36.527	43.565	19.268
% WHOLESALE & RETAIL EMPLOYMENT	12.255	15.160	23.709
% SERVICES EMPLOYMENT	9.068	11.487	26.677
% OTHER TERTIARY EMPLOYMENT	7.772	9.399	20.935
% GOVERNMENT EMPLOYMENT	1.806	1.921	6.370

Appendix 3 (continued)

Population and Employment Distribution for Individual RECs,
1960-1970

	1960 ----	1970 ----	% CHANGE 1960-1970 -----
ISE			
POPULATION (1000'S)	174.001	178.606	2.647
TOTAL EMPLOYMENT (1000'S)	81.899	89.332	9.076
% PRIMARY EMPLOYMENT	34.899	21.368	-38.771
% SECONDARY EMPLOYMENT	26.630	31.736	19.175
% WHOLESALE & RETAIL EMPLOYMENT	15.081	18.480	22.539
% SERVICES EMPLOYMENT	12.992	16.738	28.834
% OTHER TERTIARY EMPLOYMENT	7.663	8.655	12.648
% GOVERNMENT EMPLOYMENT	2.716	3.023	11.320
GTSU			
POPULATION (1000'S)	302.222	356.159	17.847
TOTAL EMPLOYMENT (1000'S)	148.856	183.167	26.407
% PRIMARY EMPLOYMENT	31.751	18.542	-41.602
% SECONDARY EMPLOYMENT	31.080	37.159	19.531
% WHOLESALE & RETAIL EMPLOYMENT	13.173	16.117	22.349
% SERVICES EMPLOYMENT	11.314	14.087	31.582
% OTHER TERTIARY EMPLOYMENT	8.592	9.263	7.812
% GOVERNMENT EMPLOYMENT	4.033	4.032	-1.251
KYOTO			
POPULATION (1000'S)	1511.077	1809.412	19.743
TOTAL EMPLOYMENT (1000'S)	685.412	885.094	29.133
% PRIMARY EMPLOYMENT	8.140	4.460	-45.206
% SECONDARY EMPLOYMENT	39.565	39.608	0.058
% WHOLESALE & RETAIL EMPLOYMENT	22.435	24.818	10.622
% SERVICES EMPLOYMENT	32.173	18.339	-43.000
% OTHER TERTIARY EMPLOYMENT	5.644	9.683	
% GOVERNMENT EMPLOYMENT	3.311	3.092	-6.624
OSAKA			
POPULATION (1000'S)	6781.229	9495.198	40.022
TOTAL EMPLOYMENT (1000'S)	3044.325	4569.322	50.093
% PRIMARY EMPLOYMENT	6.482	2.791	-56.935
% SECONDARY EMPLOYMENT	47.012	45.699	-2.794
% WHOLESALE & RETAIL EMPLOYMENT	21.616	23.989	10.976
% SERVICES EMPLOYMENT	12.903	13.915	7.849
% OTHER TERTIARY EMPLOYMENT	9.460	11.156	17.920
% GOVERNMENT EMPLOYMENT	2.527	2.450	-3.033
KOBE			
POPULATION (1000'S)	1441.703	1740.999	20.760
TOTAL EMPLOYMENT (1000'S)	764.895	823.438	7.654
% PRIMARY EMPLOYMENT	7.073	4.344	-38.585
% SECONDARY EMPLOYMENT	42.316	39.061	-7.693
% WHOLESALE & RETAIL EMPLOYMENT	18.075	22.883	26.598
% SERVICES EMPLOYMENT	11.566	15.297	32.262
% OTHER TERTIARY EMPLOYMENT	18.403	14.969	-18.659
% GOVERNMENT EMPLOYMENT	2.567	3.446	34.269
HIMEJI			
POPULATION (1000'S)	682.238	782.646	14.717
TOTAL EMPLOYMENT (1000'S)	312.019	391.158	25.364
% PRIMARY EMPLOYMENT	23.384	13.074	-44.087
% SECONDARY EMPLOYMENT	39.837	44.903	12.718
% WHOLESALE & RETAIL EMPLOYMENT	14.544	17.272	18.755
% SERVICES EMPLOYMENT	10.263	12.106	17.961
% OTHER TERTIARY EMPLOYMENT	9.255	9.837	6.294
% GOVERNMENT EMPLOYMENT	2.718	2.808	3.283

Appendix 3 (continued)

Population and Employment Distribution for Individual RECs,
1960-1970

	1960	1970	% CHANGE 1960-1970
NARA	----	----	-----
POPULATION (1000'S)	205.020	284.712	38.870
TOTAL EMPLOYMENT (1000'S)	90.552	133.230	47.131
% PRIMARY EMPLOYMENT	26.835	14.260	-46.856
% SECONDARY EMPLOYMENT	23.524	27.523	16.998
% WHOLESALE & RETAIL EMPLOYMENT	17.414	21.116	21.258
% SERVICES EMPLOYMENT	17.083	20.843	22.009
% OTHER TERTIARY EMPLOYMENT	10.039	11.531	14.869
% GOVERNMENT EMPLOYMENT	5.106	4.726	-7.444
WAKAYAMA			
POPULATION (1000'S)	482.104	563.051	16.790
TOTAL EMPLOYMENT (1000'S)	222.051	280.720	26.421
% PRIMARY EMPLOYMENT	24.596	15.259	-37.965
% SECONDARY EMPLOYMENT	35.021	37.281	6.454
% WHOLESALE & RETAIL EMPLOYMENT	17.105	19.283	12.737
% SERVICES EMPLOYMENT	11.652	13.701	17.587
% OTHER TERTIARY EMPLOYMENT	6.517	11.232	31.877
% GOVERNMENT EMPLOYMENT	3.107	3.243	4.368
TOTTORI			
POPULATION (1000'S)	204.752	199.035	-2.792
TOTAL EMPLOYMENT (1000'S)	96.652	106.467	10.155
% PRIMARY EMPLOYMENT	46.432	28.509	-38.601
% SECONDARY EMPLOYMENT	16.361	26.567	62.380
% WHOLESALE & RETAIL EMPLOYMENT	13.254	15.823	19.389
% SERVICES EMPLOYMENT	12.956	16.710	28.980
% OTHER TERTIARY EMPLOYMENT	6.831	8.152	19.347
% GOVERNMENT EMPLOYMENT	4.166	4.238	1.707
YONAGO			
POPULATION (1000'S)	181.576	186.272	2.586
TOTAL EMPLOYMENT (1000'S)	89.403	101.445	13.469
% PRIMARY EMPLOYMENT	40.610	25.287	-37.733
% SECONDARY EMPLOYMENT	16.567	23.788	28.123
% WHOLESALE & RETAIL EMPLOYMENT	14.766	18.806	27.341
% SERVICES EMPLOYMENT	12.439	16.760	34.785
% OTHER TERTIARY EMPLOYMENT	9.693	10.386	7.150
% GOVERNMENT EMPLOYMENT	3.926	4.974	26.619
MATSUE			
POPULATION (1000'S)	226.176	227.877	0.751
TOTAL EMPLOYMENT (1000'S)	111.494	122.424	9.803
% PRIMARY EMPLOYMENT	44.935	29.999	-33.239
% SECONDARY EMPLOYMENT	16.800	21.758	29.512
% WHOLESALE & RETAIL EMPLOYMENT	14.626	19.064	30.341
% SERVICES EMPLOYMENT	13.050	17.339	32.865
% OTHER TERTIARY EMPLOYMENT	6.366	7.692	20.816
% GOVERNMENT EMPLOYMENT	4.224	4.149	-1.753
OKAYAMA			
POPULATION (1000'S)	578.238	641.775	10.988
TOTAL EMPLOYMENT (1000'S)	278.889	342.278	22.729
% PRIMARY EMPLOYMENT	34.014	19.992	-41.224
% SECONDARY EMPLOYMENT	25.396	30.222	18.993
% WHOLESALE & RETAIL EMPLOYMENT	16.707	20.855	24.833
% SERVICES EMPLOYMENT	12.400	15.655	27.863
% OTHER TERTIARY EMPLOYMENT	6.130	9.662	18.841
% GOVERNMENT EMPLOYMENT	3.352	3.414	1.861

Appendix 3 (continued)
 Population and Employment Distribution for Individual RECs,
 1960-1970

	1960	1970	% CHANGE 1960-1970
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KURASHIKI			
POPULATION (1000'S)	337.115	418.465	24.131
TOTAL EMPLOYMENT (1000'S)	174.078	226.730	30.246
% PRIMARY EMPLOYMENT	31.215	15.480	-50.408
% SECONDARY EMPLOYMENT	40.543	49.145	21.217
% WHOLESALE & RETAIL EMPLOYMENT	11.971	14.128	18.022
% SERVICES EMPLOYMENT	8.986	11.337	26.166
% OTHER TERTIARY EMPLOYMENT	5.394	8.034	48.946
% GOVERNMENT EMPLOYMENT	1.892	1.876	-0.833
HIRGSHIMA			
POPULATION (1000'S)	767.071	1025.807	33.730
TOTAL EMPLOYMENT (1000'S)	374.063	523.443	39.934
% PRIMARY EMPLOYMENT	18.364	7.798	-57.538
% SECONDARY EMPLOYMENT	32.885	35.477	7.882
% WHOLESALE & RETAIL EMPLOYMENT	16.448	23.426	26.983
% SERVICES EMPLOYMENT	13.566	16.359	20.588
% OTHER TERTIARY EMPLOYMENT	11.763	12.063	2.550
% GOVERNMENT EMPLOYMENT	4.974	4.877	-1.941
FUKUYAMA			
POPULATION (1000'S)	475.869	544.938	14.514
TOTAL EMPLOYMENT (1000'S)	239.162	290.370	21.411
% PRIMARY EMPLOYMENT	31.123	15.294	-50.861
% SECONDARY EMPLOYMENT	35.393	43.279	22.282
% WHOLESALE & RETAIL EMPLOYMENT	14.757	17.937	21.553
% SERVICES EMPLOYMENT	10.032	12.587	25.464
% OTHER TERTIARY EMPLOYMENT	6.707	8.930	33.139
% GOVERNMENT EMPLOYMENT	1.968	1.974	-0.736
SHIMONOSEKI			
POPULATION (1000'S)	331.674	328.801	-0.926
TOTAL EMPLOYMENT (1000'S)	143.161	156.874	9.579
% PRIMARY EMPLOYMENT	24.250	16.781	-30.799
% SECONDARY EMPLOYMENT	25.359	27.937	10.363
% WHOLESALE & RETAIL EMPLOYMENT	19.199	20.907	8.898
% SERVICES EMPLOYMENT	13.700	15.105	10.259
% OTHER TERTIARY EMPLOYMENT	13.886	15.946	14.885
% GOVERNMENT EMPLOYMENT	3.613	3.274	-9.387
UBE			
POPULATION (1000'S)	242.216	211.317	-12.757
TOTAL EMPLOYMENT (1000'S)	101.387	105.615	4.170
% PRIMARY EMPLOYMENT	18.113	13.850	-23.538
% SECONDARY EMPLOYMENT	41.087	36.146	-12.026
% WHOLESALE & RETAIL EMPLOYMENT	17.275	20.434	18.286
% SERVICES EMPLOYMENT	12.813	16.072	25.429
% OTHER TERTIARY EMPLOYMENT	8.301	10.809	30.206
% GOVERNMENT EMPLOYMENT	2.410	2.690	11.626
YAMAGUCHI			
POPULATION (1000'S)	117.285	117.104	-0.154
TOTAL EMPLOYMENT (1000'S)	56.758	61.206	7.837
% PRIMARY EMPLOYMENT	34.071	23.170	-31.995
% SECONDARY EMPLOYMENT	11.690	14.935	27.757
% WHOLESALE & RETAIL EMPLOYMENT	17.330	20.733	19.637
% SERVICES EMPLOYMENT	16.354	20.508	25.403
% OTHER TERTIARY EMPLOYMENT	9.625	10.877	13.015
% GOVERNMENT EMPLOYMENT	10.931	9.777	-10.555

Appendix 3 (continued)
 Population and Employment Distribution for Individual RECs,
 1960-1970

	1960	1970	% CHANGE 1960-1970
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IWAKUNI			
POPULATION (1000'S)	168.067	174.427	3.784
TOTAL EMPLOYMENT (1000'S)	78.356	86.833	10.819
% PRIMARY EMPLOYMENT	24.069	13.142	-45.398
% SECONDARY EMPLOYMENT	35.467	40.495	14.176
% WHOLESALE & RETAIL EMPLOYMENT	15.319	17.766	15.979
% SERVICES EMPLOYMENT	14.106	15.256	8.150
% OTHER TERTIARY EMPLOYMENT	7.728	10.102	30.709
% GOVERNMENT EMPLOYMENT	3.311	3.239	-2.164
TOKUSHIMA			
POPULATION (1000'S)	429.176	444.997	3.686
TOTAL EMPLOYMENT (1000'S)	196.041	225.576	15.066
% PRIMARY EMPLOYMENT	31.840	19.806	-37.795
% SECONDARY EMPLOYMENT	27.174	31.885	17.336
% WHOLESALE & RETAIL EMPLOYMENT	15.230	19.133	25.628
% SERVICES EMPLOYMENT	11.366	15.733	38.417
% OTHER TERTIARY EMPLOYMENT	11.147	9.260	-16.927
% GOVERNMENT EMPLOYMENT	3.243	4.183	28.985
TAKAMATSU			
POPULATION (1000'S)	579.910	602.948	3.973
TOTAL EMPLOYMENT (1000'S)	277.099	321.419	15.994
% PRIMARY EMPLOYMENT	37.908	21.366	-43.636
% SECONDARY EMPLOYMENT	22.454	29.942	33.351
% WHOLESALE & RETAIL EMPLOYMENT	13.292	19.403	45.982
% SERVICES EMPLOYMENT	11.783	15.176	28.796
% OTHER TERTIARY EMPLOYMENT	11.999	10.419	-13.167
% GOVERNMENT EMPLOYMENT	2.565	3.693	43.979
MATSUYAMA			
POPULATION (1000'S)	368.872	428.545	16.177
TOTAL EMPLOYMENT (1000'S)	235.399	204.981	-12.922
% PRIMARY EMPLOYMENT	23.417	19.032	-18.725
% SECONDARY EMPLOYMENT	15.905	25.968	63.268
% WHOLESALE & RETAIL EMPLOYMENT	12.163	21.508	76.835
% SERVICES EMPLOYMENT	9.423	18.109	92.186
% OTHER TERTIARY EMPLOYMENT	36.144	11.043	-69.446
% GOVERNMENT EMPLOYMENT	2.946	4.339	47.177
IMABARI			
POPULATION (1000'S)	163.971	171.216	4.418
TOTAL EMPLOYMENT (1000'S)	75.010	89.132	18.814
% PRIMARY EMPLOYMENT	29.257	18.108	-38.109
% SECONDARY EMPLOYMENT	34.947	41.641	19.157
% WHOLESALE & RETAIL EMPLOYMENT	15.722	17.420	10.801
% SERVICES EMPLOYMENT	11.431	12.786	11.855
% OTHER TERTIARY EMPLOYMENT	6.699	8.030	19.939
% GOVERNMENT EMPLOYMENT	1.949	2.016	3.439
NIIHARA			
POPULATION (1000'S)	197.286	193.238	-2.052
TOTAL EMPLOYMENT (1000'S)	79.526	92.757	16.637
% PRIMARY EMPLOYMENT	24.442	15.821	-35.273
% SECONDARY EMPLOYMENT	39.556	41.390	4.637
% WHOLESALE & RETAIL EMPLOYMENT	14.052	16.564	17.880
% SERVICES EMPLOYMENT	11.991	14.261	18.932
% OTHER TERTIARY EMPLOYMENT	7.890	9.798	24.179
% GOVERNMENT EMPLOYMENT	2.069	2.165	4.688

Appendix 3 (continued)

Population and Employment Distribution for Individual RECs,
1960-1970

	1960	1970	% CHANGE 1960-1970
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KOCHI			
POPULATION (1000'S)	320.245	361.737	12.956
TOTAL EMPLOYMENT (1000'S)	152.919	189.711	24.060
% PRIMARY EMPLOYMENT	29.259	16.589	-43.303
% SECONDARY EMPLOYMENT	22.464	24.664	9.791
% WHOLESALE & RETAIL EMPLOYMENT	19.833	23.716	19.581
% SERVICES EMPLOYMENT	16.142	20.640	27.664
% OTHER TERTIARY EMPLOYMENT	8.394	9.982	18.924
% GOVERNMENT EMPLOYMENT	3.908	4.409	12.822
KITAKYUSHU			
POPULATION (1000'S)	1518.451	1501.563	-1.112
TOTAL EMPLOYMENT (1000'S)	609.503	668.908	9.746
% PRIMARY EMPLOYMENT	12.026	7.937	-34.019
% SECONDARY EMPLOYMENT	40.076	36.262	-9.516
% WHOLESALE & RETAIL EMPLOYMENT	18.923	21.576	14.017
% SERVICES EMPLOYMENT	13.947	16.547	18.640
% OTHER TERTIARY EMPLOYMENT	12.030	13.572	12.811
% GOVERNMENT EMPLOYMENT	2.995	4.107	37.132
FUKUOKA			
POPULATION (1000'S)	1063.653	1324.394	24.514
TOTAL EMPLOYMENT (1000'S)	451.869	624.000	38.093
% PRIMARY EMPLOYMENT	19.679	10.286	-47.732
% SECONDARY EMPLOYMENT	24.380	25.835	5.965
% WHOLESALE & RETAIL EMPLOYMENT	22.440	27.422	22.205
% SERVICES EMPLOYMENT	15.782	19.053	20.724
% OTHER TERTIARY EMPLOYMENT	14.026	12.658	-9.753
% GOVERNMENT EMPLOYMENT	3.693	4.746	28.526
OSUTA			
POPULATION (1000'S)	307.501	263.243	-14.393
TOTAL EMPLOYMENT (1000'S)	108.231	115.183	6.423
% PRIMARY EMPLOYMENT	19.810	15.156	-23.493
% SECONDARY EMPLOYMENT	40.943	34.828	-14.937
% WHOLESALE & RETAIL EMPLOYMENT	17.149	19.460	13.479
% SERVICES EMPLOYMENT	12.402	15.805	27.438
% OTHER TERTIARY EMPLOYMENT	7.320	8.606	17.560
% GOVERNMENT EMPLOYMENT	2.375	6.146	158.712
KURUME			
POPULATION (1000'S)	449.080	443.424	-1.259
TOTAL EMPLOYMENT (1000'S)	207.301	223.054	7.599
% PRIMARY EMPLOYMENT	35.409	26.428	-25.363
% SECONDARY EMPLOYMENT	21.295	27.136	27.432
% WHOLESALE & RETAIL EMPLOYMENT	16.442	19.591	19.154
% SERVICES EMPLOYMENT	12.483	14.891	19.290
% OTHER TERTIARY EMPLOYMENT	10.193	7.564	-25.793
% GOVERNMENT EMPLOYMENT	4.170	4.389	5.048
SAGA			
POPULATION (1000'S)	266.944	256.165	-4.038
TOTAL EMPLOYMENT (1000'S)	113.040	122.993	8.805
% PRIMARY EMPLOYMENT	32.716	24.529	-25.029
% SECONDARY EMPLOYMENT	23.633	23.731	0.415
% WHOLESALE & RETAIL EMPLOYMENT	18.815	17.162	-8.785
% SERVICES EMPLOYMENT	13.911	4.815	-65.386
% OTHER TERTIARY EMPLOYMENT	6.722	8.472	26.045
% GOVERNMENT EMPLOYMENT	4.202	21.291	406.683

Appendix 3 (continued)

Population and Employment Distribution for Individual RECs,
1960-1970

	1960	1970	% CHANGE 1960-1970
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NAGASAKI			
POPULATION (1000'S)	506.565	545.435	7.673
TOTAL EMPLOYMENT (1000'S)	199.010	235.702	18.437
% PRIMARY EMPLOYMENT	23.311	12.735	-45.370
% SECONDARY EMPLOYMENT	27.906	28.223	1.135
% WHOLESALE & RETAIL EMPLOYMENT	20.420	24.260	18.803
% SERVICES EMPLOYMENT	15.209	19.029	25.119
% OTHER TERTIARY EMPLOYMENT	9.158	11.304	23.428
% GOVERNMENT EMPLOYMENT	3.996	4.450	11.358
SASEBO			
POPULATION (1000'S)	297.099	272.294	-8.349
TOTAL EMPLOYMENT (1000'S)	119.438	125.404	4.995
% PRIMARY EMPLOYMENT	16.230	11.129	-38.953
% SECONDARY EMPLOYMENT	24.726	26.775	8.288
% WHOLESALE & RETAIL EMPLOYMENT	21.976	24.809	12.890
% SERVICES EMPLOYMENT	17.553	19.229	9.549
% OTHER TERTIARY EMPLOYMENT	9.485	10.613	12.126
% GOVERNMENT EMPLOYMENT	8.050	7.445	-7.518
KUMAMOTO			
POPULATION (1000'S)	452.950	516.223	13.967
TOTAL EMPLOYMENT (1000'S)	188.361	239.439	27.117
% PRIMARY EMPLOYMENT	21.022	11.796	-43.886
% SECONDARY EMPLOYMENT	19.445	20.810	7.015
% WHOLESALE & RETAIL EMPLOYMENT	24.343	26.564	9.125
% SERVICES EMPLOYMENT	18.212	21.607	18.641
% OTHER TERTIARY EMPLOYMENT	9.717	11.459	17.932
% GOVERNMENT EMPLOYMENT	7.282	7.764	6.924
YATSUSHIRO			
POPULATION (1000'S)	152.094	140.809	-7.420
TOTAL EMPLOYMENT (1000'S)	63.568	66.065	3.900
% PRIMARY EMPLOYMENT	40.836	30.321	-25.750
% SECONDARY EMPLOYMENT	20.510	24.113	17.566
% WHOLESALE & RETAIL EMPLOYMENT	17.575	20.094	14.332
% SERVICES EMPLOYMENT	12.254	14.654	19.582
% OTHER TERTIARY EMPLOYMENT	6.326	7.918	25.163
% GOVERNMENT EMPLOYMENT	2.497	2.900	16.102
OITA			
POPULATION (1000'S)	386.147	446.885	15.729
TOTAL EMPLOYMENT (1000'S)	167.593	213.011	27.100
% PRIMARY EMPLOYMENT	26.151	13.408	-48.730
% SECONDARY EMPLOYMENT	22.675	24.528	8.171
% WHOLESALE & RETAIL EMPLOYMENT	19.492	22.906	17.513
% SERVICES EMPLOYMENT	17.567	21.565	22.619
% OTHER TERTIARY EMPLOYMENT	8.958	11.969	33.612
% GOVERNMENT EMPLOYMENT	5.137	5.625	9.501
MIYAZAKI			
POPULATION (1000'S)	185.852	222.602	19.774
TOTAL EMPLOYMENT (1000'S)	80.505	109.042	35.447
% PRIMARY EMPLOYMENT	33.470	17.574	-47.505
% SECONDARY EMPLOYMENT	14.320	17.748	23.933
% WHOLESALE & RETAIL EMPLOYMENT	22.163	26.717	20.549
% SERVICES EMPLOYMENT	16.395	22.215	35.494
% OTHER TERTIARY EMPLOYMENT	8.283	10.443	26.076
% GOVERNMENT EMPLOYMENT	5.361	5.304	-1.067

Appendix 3 (continued)
 Population and Employment Distribution for Individual RECs,
 1960-1970

	1960	1970	% CHANGE 1960-1970
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NOBECKA			
POPULATION (1000'S)	138.291	143.832	4.007
TOTAL EMPLOYMENT (1000'S)	60.731	69.613	14.625
% PRIMARY EMPLOYMENT	24.864	14.998	-39.681
% SECONDARY EMPLOYMENT	35.700	40.641	5.015
% WHOLESALE & RETAIL EMPLOYMENT	16.427	19.802	20.550
% SERVICES EMPLOYMENT	12.322	15.066	22.272
% OTHER TERTIARY EMPLOYMENT	5.560	6.514	17.164
% GOVERNMENT EMPLOYMENT	2.127	2.979	40.021
KAGOSHIMA			
POPULATION (1000'S)	404.980	469.326	15.889
TOTAL EMPLOYMENT (1000'S)	169.996	211.329	24.314
% PRIMARY EMPLOYMENT	27.048	12.524	-53.696
% SECONDARY EMPLOYMENT	20.033	23.383	16.608
% WHOLESALE & RETAIL EMPLOYMENT	22.331	25.596	14.317
% SERVICES EMPLOYMENT	15.677	19.910	25.399
% OTHER TERTIARY EMPLOYMENT	9.996	12.668	26.715
% GOVERNMENT EMPLOYMENT	4.533	5.917	27.720

APPENDIX 4

Shift Share Analysis of Employment

Table 1

Total Employment

	1. ACTUAL 1960 -----	2. ACTUAL 1970 -----	3. EXPECTED 1970 -----	4. SHIFT FACTOR (2-3) -----	5. SHIFT INDEX -----	
1.	SAPPORO	370.4	608.4	492.9	115.47	1.23
2.	HAKODATE	121.8	151.9	162.1	-10.25	0.94
3.	MURORAN	78.9	104.8	105.0	-0.27	1.00
4.	KUSHIRO	66.5	72.9	88.5	4.34	1.05
5.	MORIOKA	74.0	102.7	98.5	4.21	1.04
6.	SENDAI	337.5	457.7	449.1	8.52	1.02
7.	ISHIMACHI	56.8	68.2	75.6	-7.40	0.90
8.	AKITA	154.6	165.5	205.7	-20.19	0.90
9.	YAMAGATA	185.8	208.8	247.2	-38.44	0.84
10.	FUKUSHIMA	143.1	169.5	190.4	-20.98	0.89
11.	AIZUWAKAMATSU	52.2	61.5	69.5	-7.97	0.89
12.	KORIYAMA	140.3	167.8	186.7	-18.86	0.90
13.	MITO	168.5	205.2	224.2	-19.08	0.91
14.	HITACHI	146.4	164.7	194.8	-30.10	0.85
15.	UTSUNOMIYA	237.9	300.2	316.5	-16.32	0.95
16.	MAEBASHI	122.6	157.5	163.2	-5.70	0.97
17.	TAKASAKI	165.7	204.9	220.5	-15.66	0.93
18.	KIRYU	73.1	89.4	97.3	-7.84	0.92
19.	KUMAGAYA	127.9	154.3	170.2	-15.91	0.91
20.	CHIBA	247.7	393.9	329.6	64.34	1.20
21.	TOKYO	6136.4	8726.4	8166.1	560.27	1.07
22.	YOKOHAMA	899.5	1572.3	1197.0	375.23	1.31
23.	HIRATSUKA	66.5	111.6	88.5	23.13	1.26
24.	ODAWARA	106.7	144.3	142.0	2.32	1.02
25.	NIIGATA	293.4	356.3	390.4	-34.12	0.91
26.	NAGAOKA	105.3	122.5	140.1	-17.62	0.87
27.	TOYAMA	240.4	269.0	320.0	-51.00	0.84
28.	TAKAOKA	183.7	203.2	244.4	-41.16	0.83
29.	KANAZAWA	236.0	284.6	314.0	-29.43	0.91
30.	FUKUI	253.6	281.0	337.5	-56.50	0.83
31.	KOFU	169.3	195.2	225.3	-30.12	0.87
32.	NAGANO	188.7	222.9	251.2	-28.23	0.89
33.	MATSUMOTO	141.3	166.8	188.0	-21.20	0.89
34.	GIFU	310.4	403.2	413.1	-9.82	0.98
35.	SHIZUOKA	366.1	476.6	487.2	-10.59	0.98
36.	HAMAMATSU	366.4	449.5	487.6	-38.09	0.92
37.	NUMAZU	149.4	209.6	198.8	10.83	1.05
38.	NAGOYA	1646.7	2190.8	2191.4	-0.67	1.00
39.	TOYOHASHI	191.1	242.6	254.3	-11.64	0.95
40.	TOYOTA	158.3	245.1	210.6	34.53	1.16
41.	TSU	140.0	160.0	186.3	-26.33	0.86
42.	YOKKAICHI	195.5	237.8	260.1	-22.35	0.91
43.	ISE	81.9	89.3	109.0	-19.66	0.82
44.	OTSU	148.9	168.2	198.1	-9.93	0.95
45.	KYOTO	685.4	885.1	912.1	-27.03	0.97

POPULATION AND EMPLOYMENT VALUES IN THOUSANDS

Table 1 (continued)

Total Employment

	1. ACTUAL 1960 -----	2. ACTUAL 1970 -----	3. EXPECTED 1970 -----	4. SHIFT FACTOR (2-3) -----	5. SHIFT INDEX -----
46. OSAKA	3044.3	4569.3	4051.3	518.02	1.13
47. KOBE	764.9	823.4	1017.9	-194.46	0.81
48. HIMEJI	312.0	391.2	415.2	-24.07	0.94
49. NARA	90.6	133.2	120.5	12.73	1.11
50. WAKAYAMA	222.1	280.7	295.5	-14.78	0.95
51. TOTTORI	96.7	106.5	128.6	-22.15	0.83
52. YONAGO	89.4	101.4	119.0	-17.53	0.85
53. MATSUE	111.5	122.4	148.4	-25.95	0.83
54. OKAYAMA	278.9	342.3	371.1	-28.86	0.92
55. KURASHIKI	174.1	226.7	231.7	-4.93	0.98
56. HIROSHIMA	374.1	523.4	497.8	25.65	1.05
57. FUKUYAMA	239.2	270.4	318.3	-27.90	0.91
58. SHIMONOSEKI	143.2	156.9	190.5	-33.64	0.82
59. UBE	101.4	105.6	134.9	-29.31	0.78
60. YAMAGUCHI	56.8	61.2	75.5	-14.33	0.61
61. IWAKUNI	78.4	86.8	104.3	-17.44	0.83
62. TOKUSHIMASHI	196.0	225.6	260.9	-35.31	0.86
63. TAKAMATSU	277.1	321.4	368.8	-47.34	0.87
64. MATSUYAMA	235.4	205.0	313.3	-108.28	0.65
65. IMABARI	75.0	89.1	99.8	-10.70	0.89
66. NIHHAMA	73.5	92.8	105.8	-13.07	0.88
67. KOCHI	152.9	189.7	203.5	-13.79	0.93
68. KITAKYUSHU	609.5	688.9	811.1	-142.20	0.82
69. FUKUOKA	451.9	624.0	601.3	22.67	1.04
70. OMUTA	108.2	115.2	144.0	-28.85	0.80
71. KURUME	207.3	223.1	275.9	-52.82	0.81
72. SAGA	113.0	123.0	150.4	-27.44	0.82
73. NAGASAKI	199.0	235.7	264.8	-29.13	0.89
74. SASEBO	119.4	125.4	158.9	-33.54	0.79
75. KUMAMOTO	188.4	239.4	250.7	-11.23	0.96
76. YATSUSHIRO	63.6	66.1	84.6	-18.55	0.78
77. OITA	167.6	213.0	223.0	-10.02	0.96
78. MIYAZAKI	80.5	109.0	107.1	1.91	1.02
79. NABEOKA	60.7	89.6	80.8	-11.21	0.86
80. KAGOSHIMA	170.0	211.3	226.2	-14.90	0.93
REGIONAL TOTALS					
1. HOKKAIDO	637.7	957.9	848.6	109.29	1.13
2. TOHOKU	1144.2	1421.6	1522.7	-101.12	0.93
3. KANTO	8668.2	12419.9	11535.4	884.55	1.08
4. TOKAI	3605.7	4704.6	4798.4	-93.79	0.98
5. HOKURIKU	1642.4	1906.4	2185.7	-279.25	0.87
6. KINKI	5268.1	7271.1	7010.7	260.47	1.04
7. CHUGOKU	1939.4	2349.3	2581.0	-231.70	0.91
8. SHIKOKU	820.0	898.0	1091.2	-193.18	0.82
9. KYUSHU	2539.2	3023.7	3379.0	-355.30	0.89

POPULATION AND EMPLOYMENT VALUES IN THOUSANDS

Table 2

Primary Employment

	1. ACTUAL 1960 -----	2. ACTUAL 1970 -----	3. EXPECTED 1970 -----	4. SHIFT FACTOR (2-3) -----	5. SHIFT INDEX -----
1. SAPPORO	33.6	22.1	23.6	-1.56	0.93
2. HAKODATE	19.0	12.9	13.4	-0.44	0.97
3. MURORAN	6.9	5.1	4.9	0.23	1.05
4. KUSHIRO	6.1	5.7	4.3	1.49	1.35
5. MORIOKA	16.4	12.2	11.5	0.68	1.06
6. SENDAI	94.2	70.3	66.2	4.11	1.06
7. ISHIMACHI	19.4	17.9	13.6	4.21	1.31
8. AKITA	58.1	42.4	40.9	1.56	1.04
9. YAMAGATA	82.5	58.3	58.0	0.28	1.00
10. FUKUSHIMA	58.1	42.9	40.8	2.10	1.05
11. AIZUWAKAMATSU	15.5	11.4	10.9	0.53	1.05
12. KORIYAMA	63.2	49.1	44.4	4.65	1.10
13. MITO	69.6	48.8	49.0	-0.21	1.00
14. HITACHI	35.4	23.7	24.9	-1.16	0.95
15. UTSUNOMIYA	95.9	72.0	67.4	4.56	1.07
16. MAEBASHI	41.2	30.7	29.0	1.69	1.06
17. TAKASAKI	68.1	50.2	47.9	2.33	1.05
18. KIRYU	9.7	6.3	6.8	-0.58	0.91
19. KUMAGAYA	62.3	45.5	43.8	1.73	1.04
20. CHIBA	99.8	65.9	70.2	-4.26	0.94
21. TOKYO	497.8	336.9	350.0	-13.17	0.96
22. YOKOHAMA	59.4	37.6	41.8	-4.20	0.90
23. HIRATSUKA	11.8	9.1	8.3	0.82	1.10
24. ODAWARA	18.4	15.6	13.0	2.66	1.21
25. NIIGATA	95.8	69.4	67.3	2.10	1.03
26. NAGAOKA	38.4	27.3	27.0	0.32	1.01
27. TOYAMA	79.9	58.7	56.2	2.51	1.04
28. TAKAOKA	72.3	48.5	50.8	-2.30	0.95
29. KANAZAWA	63.1	40.2	44.4	-4.15	0.91
30. FUKUI	89.2	59.3	62.7	-3.41	0.95
31. KOFU	61.8	46.4	43.5	2.98	1.07
32. NAGANO	72.5	53.5	51.0	2.53	1.05
33. MATSUMOTO	58.1	43.4	40.9	2.52	1.06
34. GIFU	76.4	53.1	53.7	-0.61	0.99
35. SHIZUOKA	88.6	69.2	62.3	6.96	1.11
36. HAMAMATSU	116.0	81.2	81.6	-0.40	1.00
37. NUMAZU	34.5	23.4	24.2	-0.83	0.97
38. NAGOYA	216.4	149.6	152.1	-2.54	0.98
39. TOYOHASHI	61.1	47.2	42.9	4.21	1.10
40. TOYOTA	46.6	30.4	32.7	-2.37	0.93
41. TSU	50.3	36.3	35.3	0.95	1.03
42. YOKKAICHI	63.7	43.9	44.8	-0.86	0.98
43. ISE	28.6	19.1	20.1	-1.01	0.95
44. OTSU	47.3	34.9	33.2	1.66	1.05
45. KYOTO	55.8	39.5	39.2	0.25	1.01

POPULATION AND EMPLOYMENT VALUES IN THOUSANDS

Table 2 (continued)

Primary Employment

		1. ACTUAL 1960 -----	2. ACTUAL 1970 -----	3. EXPECTED 1970 -----	4. SHIFT FACTOR (2-3) -----	5. SHIFT INDEX -----
46.	OSAKA	197.3	127.5	138.8	-11.20	0.92
47.	KOBE	54.1	35.8	38.0	-2.27	0.94
48.	HIMEJI	73.0	51.1	51.3	-0.16	1.00
49.	NARA	24.3	19.0	17.1	1.91	1.11
50.	WAKAYAMA	54.6	42.8	38.4	4.43	1.12
51.	TOTTORI	44.9	30.4	31.6	-1.20	0.96
52.	YOYAGO	36.3	25.7	25.5	0.12	1.00
53.	MATSUE	50.1	36.7	35.2	1.50	1.04
54.	OKAYAMA	94.9	68.4	66.7	1.73	1.03
55.	KURASHIKI	54.3	35.1	38.2	-3.11	0.92
56.	HIROSHIMA	68.7	40.8	48.3	-7.49	0.85
57.	FUKUYAMA	74.4	44.4	52.3	-7.93	0.85
58.	SHIMONOSEKI	34.7	26.3	24.4	1.91	1.00
59.	UBE	18.4	14.6	12.9	1.71	1.13
60.	YAMAGUCHI	19.3	14.2	13.6	0.58	1.04
61.	IWAKUNI	18.9	11.4	13.3	-1.85	0.86
62.	TOKUSHIMASHI	62.4	44.7	43.9	0.79	1.02
63.	TAKAMATSU	105.0	68.7	73.9	-5.19	0.93
64.	MATSUYAMA	55.1	39.0	38.8	0.25	1.01
65.	IMABARI	21.9	16.1	15.4	0.71	1.05
66.	NIIHAMA	19.4	14.7	13.7	1.01	1.07
67.	KUCHI	44.7	31.5	31.5	0.01	1.00
68.	KITAKYUSHU	73.3	53.1	51.6	1.54	1.03
69.	FUKUOKA	88.9	64.2	62.5	1.66	1.03
70.	OMUTA	21.4	17.5	15.1	2.38	1.16
71.	KURUME	73.4	58.9	51.6	7.34	1.14
72.	SAGA	37.0	30.2	26.0	4.16	1.16
73.	NAGASAKI	46.4	30.0	32.6	-2.60	0.92
74.	SASEBO	21.8	14.0	15.3	-1.35	0.91
75.	KUMAMOTO	39.6	28.2	27.8	0.40	1.01
76.	YATSUSHIRO	26.0	20.0	18.3	1.77	1.10
77.	OITA	43.6	28.6	30.8	-2.26	0.93
78.	MIYAZAKI	27.0	19.2	19.0	0.21	1.01
79.	NABEOKA	15.1	10.4	10.6	-0.18	0.98
80.	KAGOSHIMA	46.0	26.5	32.3	-5.86	0.82
REGIONAL TOTALS						
1.	HOKKAIDO	65.6	45.9	46.1	-0.27	0.99
2.	TOHOKU	407.4	304.6	286.5	18.12	1.06
3.	KANTO	1131.4	708.7	795.5	-6.81	0.99
4.	TOKAI	782.0	553.4	549.9	3.50	1.01
5.	HOKURIKU	569.3	400.4	400.3	0.11	1.00
6.	KINKI	506.4	350.7	356.1	-5.39	0.98
7.	CHUGOKU	577.3	372.7	405.9	-13.23	0.97
8.	SHIKOKU	246.3	170.0	173.2	-3.21	0.98
9.	KYUSHU	559.6	400.7	393.5	7.20	1.02

Table 3
Secondary Employment

	1. ACTUAL 1960 -----	2. ACTUAL 1970 -----	3. EXPECTED 1970 -----	4. SHIFT FACTOR (2-3) -----	5. SHIFT INDEX -----
1. SAPPORO	96.7	103.6	136.6	26.93	1.20
2. HAKODATE	34.3	40.2	48.5	-8.30	0.83
3. MURORAN	31.3	37.2	44.2	-7.04	0.84
4. KUSHIRO	24.4	28.1	34.5	-6.39	0.82
5. MORIOKA	12.8	19.2	18.1	1.16	1.06
6. SENDAI	67.9	112.6	96.0	16.59	1.17
7. ISHIMACHI	14.3	19.0	20.2	-1.19	0.94
8. AKITA	29.9	41.6	42.3	-0.62	0.99
9. YAMAGATA	34.8	55.3	49.2	6.13	1.12
10. FUKUSHIMA	29.3	46.9	41.4	5.46	1.13
11. AIZUWAKAMATSU	12.7	18.8	18.0	0.79	1.04
12. KORIYAMA	27.3	45.4	38.6	6.75	1.17
13. MITO	33.0	57.1	46.6	10.46	1.22
14. HITACHI	70.2	81.8	99.2	-17.36	0.82
15. UTSUNOMIYA	51.3	95.2	72.5	22.69	1.31
16. MAEBASHI	31.0	49.3	43.8	5.48	1.12
17. TAKASAKI	40.4	68.5	57.2	11.35	1.20
18. KIRYU	38.8	50.2	54.8	-4.67	0.91
19. KUMAGAYA	27.1	49.2	38.3	10.88	1.28
20. CHIBA	55.3	136.4	78.2	60.20	1.77
21. TOKYO	2535.7	3533.6	3584.2	-50.65	0.99
22. YOKOHAMA	363.8	684.8	514.2	170.63	1.33
23. HIKATSUKA	25.6	51.0	36.2	14.81	1.41
24. ODAWARA	37.7	53.3	53.3	-0.00	1.00
25. NIIGATA	60.9	90.3	97.4	-7.10	0.93
26. NAGAOKA	28.5	40.2	40.3	-0.13	1.00
27. TOYAMA	73.2	89.0	103.5	-14.53	0.86
28. TAKAOKA	51.2	74.4	72.3	2.04	1.03
29. KANAZAWA	73.3	98.0	103.6	-5.61	0.95
30. FUKUI	79.7	105.3	112.6	-7.27	0.94
31. KOFU	41.1	59.0	58.1	0.96	1.02
32. NAGANO	40.8	65.9	57.7	8.23	1.14
33. MATSUMOTO	32.7	52.3	46.2	6.05	1.13
34. GIFU	117.0	176.8	165.3	13.45	1.08
35. SHIZUOKA	130.8	181.6	184.9	-3.35	0.98
36. HAMAMATSU	129.7	197.2	183.3	13.93	1.08
37. NUMAZU	49.9	83.3	70.6	12.73	1.18
38. NAGOYA	786.3	1015.2	1111.4	-96.23	0.91
39. TOYOHASHI	61.4	94.0	86.8	7.18	1.08
40. TOYOTA	60.8	132.4	86.0	46.45	1.54
41. TSU	34.0	47.2	48.0	-0.78	0.98
42. YOKKAICHI	71.4	103.6	100.9	2.66	1.03
43. ISE	21.8	28.4	30.8	-2.48	0.92
44. OTSU	46.3	89.9	65.4	4.51	1.07
45. KYOTO	271.3	320.6	383.5	-32.94	0.91

Table 3 (continued)

Secondary Employment

	1. ACTUAL 1960 -----	2. ACTUAL 1970 -----	3. EXPECTED 1970 -----	4. SHIFT FACTOR (2-3) -----	5. SHIFT INDEX -----	
46.	OSAKA	1431.2	2088.1	2023.0	65.10	1.03
47.	KUBE	323.7	321.6	457.5	-135.88	0.70
48.	HIMEJI	124.3	175.6	175.7	-0.05	1.00
49.	NARA	21.3	36.7	30.1	6.56	1.22
50.	WAKAYAMA	77.8	104.7	109.9	-5.26	0.95
51.	TOTTORI	15.8	28.3	22.4	5.93	1.27
52.	YOIAGO	16.6	24.1	23.5	0.67	1.03
53.	MATSUE	19.7	26.6	26.5	0.16	1.01
54.	OKAYAMA	70.8	103.4	100.1	3.32	1.03
55.	KURASHIKI	70.6	111.4	99.8	11.67	1.12
56.	HIROSHIMA	123.0	145.7	173.9	11.83	1.07
57.	FUKUYAMA	84.6	125.7	119.6	6.02	1.05
58.	SHIMONOSEKI	36.3	43.9	51.3	-7.41	0.86
59.	UBE	41.7	38.2	58.9	-20.71	0.65
60.	YAMAGUCHI	6.6	9.1	9.4	-0.24	0.97
61.	IWAKUNI	27.8	35.2	39.3	-4.12	0.90
62.	TOKUSHIMASHI	53.3	71.9	75.3	-3.38	0.96
63.	TAKAMATSU	62.2	96.2	87.9	8.29	1.09
64.	MATSUYAMA	37.4	53.2	52.9	0.31	1.01
65.	IMABARI	26.2	37.1	37.1	0.06	1.00
66.	NIIHAMA	31.5	38.4	44.5	-6.07	0.86
67.	KOCHI	34.4	46.8	48.6	-1.77	0.96
68.	KITAKYUSHU	244.3	242.6	345.3	-102.71	0.70
69.	FUKUOKA	110.2	161.2	155.7	5.49	1.04
70.	OMUTA	44.3	40.1	62.6	-22.52	0.64
71.	KURUME	44.1	60.5	62.4	-1.87	0.97
72.	SAGA	26.7	29.2	37.8	-8.57	0.77
73.	NAGASAKI	55.5	66.5	78.5	-11.98	0.85
74.	SASEBO	29.5	33.6	41.7	-8.17	0.80
75.	KUMAMOTO	36.6	49.8	51.8	-1.95	0.96
76.	YATSUSHIRO	13.0	15.9	18.4	-2.50	0.86
77.	OITA	38.0	52.2	53.7	-1.47	0.97
78.	MIYAZAKI	11.5	19.4	16.3	3.06	1.19
79.	NABEOKA	23.5	28.3	33.2	-4.93	0.85
80.	KAGOSHIMA	34.1	49.4	48.2	1.23	1.03
REGIONAL TOTALS						
1.	HOKKAIDO	186.7	269.1	263.9	5.20	1.02
2.	TOHOKU	229.0	358.8	323.7	35.07	1.11
3.	KANTO	3351.0	4971.5	4736.7	234.78	1.05
4.	TOKAI	1463.0	2061.6	2068.0	-6.44	1.00
5.	HOKURIKU	448.3	615.3	633.6	-18.31	0.97
6.	KINKI	2295.8	3147.2	3245.2	-97.96	0.97
7.	CHUGOKU	565.9	803.6	799.9	3.75	1.00
8.	SHIKOKU	191.7	271.8	270.9	0.82	1.00
9.	KYUSHU	711.5	848.8	1005.7	-156.89	0.84

Table 4

Wholesale and Retail Employment

	1. ACTUAL 1960 -----	2. ACTUAL 1970 -----	3. EXPECTED 1970 -----	4. SHIFT FACTOR (2-3) -----	5. SHIFT INDEX -----
1. SAPPORO	92.2	174.1	143.4	30.74	1.21
2. HAKODATE	26.3	58.2	40.9	-2.68	0.93
3. MURORAN	13.5	22.5	21.0	1.51	1.07
4. KUSHIRO	14.2	23.7	22.1	1.59	1.07
5. MORIOKA	16.4	27.1	25.6	1.53	1.06
6. SENDAI	66.7	112.4	103.8	8.57	1.08
7. ISHIMACHI	10.7	13.5	16.6	-3.08	0.81
8. AKITA	23.5	36.6	36.6	2.02	1.06
9. YAMAGATA	27.0	58.3	42.0	-3.67	0.91
10. FUKUSHIMA	21.0	30.0	32.6	-2.57	0.92
11. AIZUWAKAMATSU	10.6	13.4	16.4	-3.02	0.82
12. KORIYAMA	20.3	30.8	31.5	-0.70	0.98
13. MITO	26.1	39.4	40.6	-1.16	0.97
14. HITACHI	16.3	23.2	25.4	-2.18	0.91
15. UTSUNOMIYA	40.2	58.2	62.5	-4.27	0.93
16. MAEBASHI	20.9	32.5	32.5	-0.04	1.00
17. TAKASAKI	23.5	37.5	36.6	0.91	1.02
18. KIRYU	12.4	16.2	19.3	-3.10	0.84
19. KUMAGAYA	16.1	24.9	25.1	-0.19	0.99
20. CHIBA	33.2	72.4	51.6	20.79	1.40
21. TOKYO	1344.8	2099.2	2091.2	7.99	1.00
22. YOKOHAMA	174.9	317.5	271.9	45.54	1.17
23. HIRATSUKA	11.6	20.5	18.0	2.50	1.14
24. ODAWARA	16.5	49.0	25.6	23.31	1.91
25. NIIGATA	53.2	60.5	82.8	-2.24	0.97
26. NAGAOKA	17.8	25.6	27.8	-2.14	0.92
27. TOYAMA	39.0	52.1	60.6	-8.46	0.86
28. TAKAOKA	26.8	34.3	41.6	-7.34	0.82
29. KANAZAWA	40.4	61.5	62.8	-1.33	0.98
30. FUKUI	36.6	49.0	56.9	-7.93	0.86
31. KOFU	29.2	39.3	45.5	-6.18	0.86
32. NAGANO	29.2	40.5	45.4	-4.91	0.89
33. MATSUMOTO	21.1	31.1	32.8	-1.78	0.95
34. GIFU	52.9	77.2	82.2	-5.03	0.94
35. SHIZUOKA	66.3	102.9	103.1	-0.23	1.00
36. HAMAMATSU	52.5	74.8	81.6	-6.80	0.92
37. NUMAZU	25.5	42.1	39.7	2.39	1.06
38. NAGOYA	292.5	479.1	454.9	24.23	1.05
39. TOYOHASHI	30.1	44.0	46.8	-2.79	0.94
40. TOYOTA	19.7	34.5	30.7	3.82	1.12
41. TSU	22.1	29.3	34.4	-5.12	0.85
42. YOKKAICHI	24.0	36.0	37.3	-1.20	0.97
43. ISE	12.4	16.5	19.2	-2.70	0.86
44. OTSU	19.6	30.3	30.5	-0.17	0.99
45. KYOTO	153.8	219.7	239.1	-19.46	0.92

Table 4 (continued)

Wholesale and Retail Employment

	1. ACTUAL 1960 -----	2. ACTUAL 1970 -----	3. EXPECTED 1970 -----	4. SHIFT FACTOR (2-3) -----	5. SHIFT INDEX -----	
46.	OSAKA	658.1	1096.1	1023.3	72.79	1.07
47.	KOBE	138.3	188.4	215.0	-26.57	0.88
48.	HIMEJI	45.4	67.6	70.6	-3.01	0.96
49.	NARA	15.8	28.1	24.5	3.61	1.15
50.	WAKAYAMA	38.0	54.1	59.1	-4.93	0.92
51.	TOTTORI	12.8	16.8	19.9	-3.07	0.85
52.	YONAGO	13.2	19.1	20.5	-1.45	0.93
53.	MATSUE	16.3	23.3	25.4	-2.02	0.92
54.	OKAYAMA	46.6	71.4	72.5	-1.07	0.99
55.	KURASHIKI	20.8	32.0	32.4	-0.37	0.99
56.	HIKOSHIMA	69.0	122.6	107.3	15.31	1.14
57.	FUKUYAMA	35.3	52.1	54.9	-2.80	0.95
58.	SHIMONOSEKI	27.5	32.8	42.7	-9.94	0.77
59.	UBE	17.5	21.6	27.2	-5.66	0.79
60.	YAMAGUCHI	9.8	12.7	15.3	-2.61	0.83
61.	IWAKUNI	12.0	15.4	18.7	-3.24	0.83
62.	TOKUSHIMASHI	29.9	43.2	46.4	-3.27	0.93
63.	TAKAMATSU	36.8	52.4	57.3	5.09	1.09
64.	MATSUYAMA	28.6	44.1	44.5	-0.44	0.99
65.	IMABARI	11.8	15.5	18.3	-2.81	0.85
66.	NIIHAMA	11.2	15.4	17.4	-2.01	0.88
67.	KOCHI	30.3	45.0	47.2	-2.17	0.95
68.	KITAKYUSHU	115.3	144.3	179.4	-35.04	0.80
69.	FUKUOKA	101.4	171.1	157.7	13.43	1.09
70.	OMUTA	18.6	22.4	28.9	-6.45	0.78
71.	KURUME	34.1	43.7	53.0	-9.30	0.82
72.	SAGA	21.3	21.1	33.1	-11.97	0.64
73.	NAGASAKI	40.6	57.2	63.2	-6.01	0.90
74.	SASEBO	26.2	31.1	40.8	-9.71	0.76
75.	KUMAMOTO	45.9	63.6	71.3	-7.70	0.89
76.	YATSUSHIRO	11.2	13.3	17.4	-4.10	0.76
77.	OITA	32.7	48.8	50.8	-2.01	0.96
78.	MIYAZAKI	17.8	29.1	27.7	1.39	1.05
79.	NABEOKA	10.0	13.8	15.5	-1.73	0.89
80.	KAGOSHIMA	38.1	54.1	59.2	-5.10	0.91
REGIONAL TOTALS						
1.	HOKKAIDO	146.2	258.6	227.4	31.16	1.14
2.	TOHOKU	196.2	304.1	305.0	-0.92	1.00
3.	KANTO	1765.8	2829.8	2745.9	83.92	1.03
4.	TOKAI	598.0	936.5	929.9	6.57	1.01
5.	HOKURIKU	264.1	374.6	410.7	-36.13	0.91
6.	KINKI	1068.8	1684.4	1662.1	22.26	1.01
7.	CHUGOKU	310.7	463.0	483.2	-20.19	0.96
8.	SHIKOKU	118.8	182.3	184.7	-2.34	0.99
9.	KYUSHU	513.1	713.6	797.9	-84.29	0.89

Table 5
Service Employment

	1. ACTUAL 1960 -----	2. ACTUAL 1970 -----	3. EXPECTED 1970 -----	4. SHIFT FACTOR (2-3) -----	5. SHIFT INDEX -----	
1.	SAPPORO	64.3	123.1	96.7	26.43	1.27
2.	HAKODATE	18.8	29.8	28.3	1.50	1.05
3.	MURORAN	12.4	19.3	18.6	0.69	1.04
4.	KUSHIRO	8.8	16.5	13.3	3.26	1.25
5.	MORIOKA	14.2	24.0	21.4	2.68	1.13
6.	SENDAI	49.9	61.5	75.0	6.48	1.09
7.	ISHIMACHI	6.2	8.8	9.3	-0.51	0.95
8.	AKITA	19.6	31.4	29.5	1.98	1.07
9.	YAMAGATA	21.3	31.0	32.1	-1.03	0.97
10.	FUKUSHIMA	18.3	27.2	27.5	-0.32	0.99
11.	AIZUWAKAMATSU	7.8	10.5	11.7	-1.18	0.90
12.	KORIYAMA	15.3	23.3	23.0	0.31	1.01
13.	MITO	20.0	32.3	30.0	2.26	1.08
14.	HITACHI	15.0	21.2	22.6	-1.39	0.94
15.	UTSUNOMIYA	26.2	40.9	39.5	1.42	1.04
16.	MAEBASHI	16.5	25.8	24.8	0.99	1.04
17.	TAKASAKI	16.1	25.0	24.2	0.77	1.03
18.	KIRYU	7.8	10.6	11.8	-1.23	0.90
19.	KUMAGAYA	11.3	16.8	17.0	-0.18	0.99
20.	CHIBA	26.5	36.9	39.9	16.98	1.43
21.	TOKYO	957.3	1466.8	1440.1	26.70	1.02
22.	YOKOHAMA	147.3	253.8	221.5	32.29	1.15
23.	HIRATSUKA	9.3	16.6	13.9	2.62	1.19
24.	ODAWARA	20.6	28.9	31.0	-2.02	0.93
25.	NIGATA	36.3	58.9	54.6	4.25	1.08
26.	NAGAOKA	11.3	17.0	17.0	-0.05	1.00
27.	TOYAMA	25.0	37.7	37.7	0.04	1.00
28.	TAKAOKA	18.4	25.6	27.7	-2.05	0.93
29.	KANAZAWA	30.1	46.2	45.2	0.97	1.02
30.	FUKUI	25.5	38.1	38.4	-0.28	0.99
31.	KOFU	20.6	28.9	31.0	-2.10	0.93
32.	NAGANO	21.6	31.9	32.5	-0.62	0.98
33.	MATSUMOTO	16.1	23.1	24.3	-1.15	0.95
34.	GIFU	34.2	52.1	51.4	0.71	1.01
35.	SHIZUOKA	42.4	64.8	63.8	1.00	1.02
36.	HAMAMATSU	35.6	53.9	53.6	0.39	1.01
37.	NUMAZU	18.6	30.2	27.9	2.22	1.08
38.	NAGOYA	167.7	262.4	252.2	30.21	1.12
39.	TOYOHASHI	21.1	32.1	31.8	0.35	1.01
40.	TOYOTA	15.2	27.2	22.9	4.23	1.18
41.	TSU	17.6	25.1	26.5	-1.44	0.95
42.	YOKKAICHI	17.7	27.3	26.7	0.65	1.02
43.	ISE	10.6	15.0	16.0	-1.05	0.93
44.	OTSU	16.8	28.0	25.3	2.68	1.11
45.	KYOTO	220.5	162.3	331.7	-169.42	0.49

Table 5 (continued)

Service Employment

	1. ACTUAL 1960 -----	2. ACTUAL 1970 -----	3. EXPECTED 1970 -----	4. SHIFT FACTOR (2-3) -----	5. SHIFT INDEX -----	
46.	OSAKA	392.0	635.8	590.9	44.23	1.08
47.	KOBE	88.5	126.0	133.1	-7.12	0.95
48.	HIMEJI	32.0	47.4	48.2	-0.82	0.98
49.	NARA	15.5	27.8	23.3	4.50	1.19
50.	WAKAYAMA	25.9	38.5	38.9	-0.46	0.99
51.	TOTTORI	12.5	17.8	18.8	-1.05	0.94
52.	YONAGO	11.1	17.0	16.7	0.28	1.02
53.	MATSUE	14.5	21.2	21.9	-0.66	0.97
54.	OKAYAMA	34.6	54.3	52.0	2.24	1.04
55.	KURASHIKI	15.6	25.7	23.5	2.17	1.09
56.	HIROSHIMA	50.7	85.6	76.3	9.29	1.12
57.	FUKUYAMA	24.0	36.5	36.1	0.45	1.01
58.	SHIMONOSEKI	19.6	23.7	29.5	-5.81	0.80
59.	UBE	13.0	17.0	19.5	-2.57	0.87
60.	YAMAGUCHI	9.3	12.6	14.0	-1.41	0.90
61.	IWAKUNI	11.1	13.2	16.6	-3.38	0.80
62.	TOKUSHIMASHI	22.3	35.5	33.5	1.97	1.06
63.	TAKAMATSU	32.7	48.8	49.1	-0.34	0.99
64.	MATSUYAMA	22.2	37.1	33.4	3.75	1.11
65.	IMABARI	8.6	11.4	12.9	-1.50	0.88
66.	NIIHAMA	9.5	13.2	14.3	-1.12	0.92
67.	KOCHI	24.7	39.2	37.1	2.02	1.05
68.	KITAKYUSHU	85.0	110.7	127.9	-17.20	0.87
69.	FUKUOKA	71.3	118.9	107.3	11.61	1.11
70.	OMUTA	13.4	18.2	20.2	-1.99	0.90
71.	KURUME	25.9	33.2	38.9	-5.71	0.85
72.	SAGA	15.7	5.9	23.7	-17.73	0.25
73.	NAGASAKI	30.3	44.9	45.5	-0.68	0.99
74.	SASEBO	21.0	24.1	31.5	-7.42	0.76
75.	KUMAMOTO	34.3	51.7	51.6	0.13	1.00
76.	YATSUSHIRO	7.8	9.7	11.7	-2.04	0.83
77.	OITA	29.5	45.9	44.3	1.60	1.04
78.	MIYAZAKI	13.2	24.2	19.9	4.37	1.22
79.	NABEOKA	7.5	10.5	11.3	-0.77	0.93
80.	KAGOSHIMA	27.0	42.1	40.6	1.47	1.04
REGIONAL TOTALS						
1.	HOKKAIDO	104.3	188.8	156.9	31.88	1.20
2.	TOHOKU	152.5	237.8	229.4	8.41	1.04
3.	KANTO	1294.5	2024.4	1947.3	77.10	1.04
4.	TOKAI	380.8	610.1	572.9	37.26	1.07
5.	HOKURIKU	184.4	278.5	277.4	1.13	1.00
6.	KINKI	792.0	1065.7	1191.4	-125.71	0.89
7.	CHUGOKU	238.4	360.1	358.6	1.53	1.00
8.	SHIKOKU	97.6	149.7	146.9	2.81	1.02
9.	KYUSHU	381.8	540.0	574.4	-34.38	0.94

Table 6
Government Employment

	1. ACTUAL 1960 -----	2. ACTUAL 1970 -----	3. EXPECTED 1970 -----	4. SHIFT FACTOR (2-3) -----	5. SHIFT INDEX -----
1. SAPPORO	32.5	38.5	44.1	-5.59	0.87
2. HAKODATE	5.2	7.6	7.1	0.53	1.08
3. MURORAN	2.7	3.6	3.7	-0.10	0.97
4. KUSHIRO	2.7	3.8	3.7	0.15	1.04
5. MORIOKA	4.2	5.8	5.7	0.12	1.02
6. SENDAI	22.4	25.1	30.4	-5.24	0.83
7. ISHIMACHI	2.6	3.1	3.5	-0.43	0.88
8. AKITA	7.8	9.1	10.6	-1.53	0.86
9. YAMAGATA	9.2	9.9	12.5	-2.55	0.80
10. FUKUSHIMA	6.3	8.2	8.5	-0.30	0.96
11. AIZUWAKAMATSU	1.3	1.6	1.7	-0.15	0.91
12. KORIYAMA	4.2	4.9	5.7	-0.80	0.86
13. MITO	8.2	9.0	11.1	-2.10	0.81
14. HITACHI	2.5	3.5	3.4	0.13	1.04
15. UTSUNOMIYA	9.9	11.9	13.4	-1.53	0.89
16. MAEBASHI	4.9	6.1	6.6	-0.54	0.92
17. TAKASAKI	4.2	5.3	5.7	-0.48	0.92
18. KIRYU	1.1	1.3	1.5	-0.17	0.89
19. KUMAGAYA	4.0	5.6	5.4	0.22	1.04
20. CHIBA	9.9	17.5	13.4	4.07	1.30
21. TOKYO	208.9	284.8	283.1	1.72	1.01
22. YOKOHAMA	42.7	61.6	57.8	3.80	1.07
23. HIRATSUKA	2.1	3.2	2.8	0.42	1.15
24. ODAWARA	2.5	3.6	3.4	0.15	1.04
25. NIIGATA	10.9	14.8	14.7	0.01	1.00
26. NAGAOKA	2.0	2.4	2.7	-0.33	0.88
27. TOYAMA	6.3	7.7	8.6	-0.89	0.90
28. TAKAOKA	3.8	5.1	5.1	-0.05	0.99
29. KANAZAWA	7.7	9.5	10.5	-1.01	0.90
30. FUKUI	6.5	8.0	8.8	-0.73	0.92
31. KOFU	5.6	6.4	7.7	-1.21	0.84
32. NAGANO	7.5	8.5	10.2	-1.77	0.83
33. MATSUMOTO	4.0	4.8	5.5	-0.73	0.87
34. GIFU	11.0	12.3	14.9	-2.60	0.83
35. SHIZUOKA	9.7	11.5	13.1	-1.60	0.88
36. HAMAMATSU	10.7	10.7	14.5	-3.85	0.74
37. NUMAZU	6.7	9.1	9.1	-0.05	0.99
38. NAGOYA	35.5	47.0	48.1	-1.14	0.98
39. TOYOHASHI	5.8	6.4	7.8	-1.40	0.82
40. TOYOTA	3.2	4.8	4.3	0.52	1.12
41. TSU	5.8	7.9	7.9	0.04	1.01
42. YUKKAICHI	3.5	4.6	4.8	-0.22	0.95
43. ISE	2.2	2.7	3.0	-0.31	0.90
44. OTSU	6.1	7.6	8.2	-0.65	0.92
45. KYOTO	22.7	27.4	30.8	-3.39	0.89

Table 6 (continued)

Government Employment

	1. ACTUAL 1960 -----	2. ACTUAL 1970 -----	3. EXPECTED 1970 -----	4. SHIFT FACTOR (2-3) -----	5. SHIFT INDEX -----	
46.	OSAKA	76.9	112.0	104.2	7.72	1.07
47.	KOBE	19.6	28.4	26.6	1.77	1.07
48.	HIMEJI	8.5	11.0	11.5	-0.51	0.96
49.	NARA	4.6	6.3	6.3	0.03	1.00
50.	WAKAYAMA	6.9	9.1	9.3	-0.25	0.97
51.	TOTTORI	4.0	4.5	5.5	-0.95	0.83
52.	YONAGO	3.5	5.0	4.8	0.29	1.06
53.	MATSUE	4.7	5.1	6.4	-1.30	0.80
54.	OKAYAMA	9.3	11.7	12.7	-0.98	0.92
55.	KURASHIKI	3.3	4.3	4.5	-0.21	0.95
56.	HIROSHIMA	18.6	25.5	25.2	0.32	1.01
57.	FUKUYAMA	4.8	5.7	6.4	-0.71	0.89
58.	SHIMONOSEKI	5.2	5.1	7.0	-1.87	0.73
59.	UBE	2.4	2.8	3.3	-0.47	0.86
60.	YAMAGUCHI	6.2	6.0	8.4	-2.42	0.71
61.	IWAKUNI	2.6	2.8	3.5	-0.70	0.80
62.	TOKUSHIMASHI	6.4	9.4	8.6	0.82	1.10
63.	TAKAMATSU	7.1	11.9	9.6	2.24	1.23
64.	MATSUYAMA	6.9	8.9	9.4	-0.51	0.95
65.	IMABARI	1.5	1.8	2.0	-0.18	0.91
66.	NIIHAMA	1.6	2.0	2.2	-0.22	0.90
67.	KUCHI	6.0	8.4	8.1	0.27	1.03
68.	KITAKYUSHU	18.3	27.5	24.7	2.74	1.11
69.	FUKUOKA	16.7	29.6	22.6	7.01	1.31
70.	OMUTA	2.6	7.1	3.5	3.59	2.03
71.	KURUME	8.7	9.8	11.7	-1.95	0.83
72.	SAGA	4.7	26.2	6.4	19.75	4.07
73.	NAGASAKI	8.0	10.5	10.8	-0.29	0.97
74.	SASERO	9.6	9.3	13.0	-3.69	0.72
75.	KUMAMOTO	13.7	18.6	18.5	0.06	1.00
76.	YATSUSHIRO	1.6	1.9	2.2	-0.24	0.89
77.	OITA	8.6	12.0	11.7	0.32	1.03
78.	MIYAZAKI	4.3	5.8	5.8	-0.06	0.99
79.	NABEOKA	1.3	2.1	1.8	0.32	1.18
80.	KAGOSHIMA	7.9	12.5	10.7	1.83	1.17
REGIONAL TOTALS						
1.	HOKKAIDO	43.2	53.5	58.5	-5.00	0.91
2.	TOHOKU	58.0	67.7	78.6	-10.89	0.86
3.	KANTO	306.5	419.8	415.3	4.48	1.01
4.	TOKAI	94.2	117.0	127.6	-10.60	0.92
5.	HOKURIK'	48.8	60.6	66.1	-5.49	0.92
6.	KINKI	145.3	201.7	196.9	4.73	1.02
7.	CHUGOKU	71.0	88.0	96.2	-8.19	0.91
8.	SHIKOKU	23.1	32.9	31.3	1.59	1.05
9.	KYUSHU	105.9	172.8	143.4	29.39	1.20

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