

**An Extended Growth-Factor Decomposition
Analysis based on Three-Region
Interregional I-O Tables:
The Case of Kyushu Region**

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Abstract

This paper applies the extended growth-factor decomposition method, which was developed by Akita (1999), to a three-region interregional I-O system consisting of the Kyushu region, the Kanto region, and all other regions in Japan to analyze the effects of regional characteristics and government policies on the growth patterns of the Kyushu region from 1965 to 1990. The Kyushu region, accounting for about 10 percent of the national economy, is regarded as an interesting case in regional economic development in Japan since its economy experienced a drastic structural change corresponding to changes in economic environment and government policies. The use of the three-region I-O system including the Kanto region also allows for an examination of the role of the Kanto region, which generates more than 40 percent of total gross domestic product and has exerted significant effects upon the rest of the nation, in the growth of Japan's regional economies. The extended growth-factor decomposition analysis based on the three-region interregional I-O system thus provides a better picture of the roles of interregional industrial linkages in the growth of Japan's regional economies. This paper analyzes changes in the pattern of regional economic growth over the period 1965-1990.

1. Introduction

Based partially on low and stable crude oil prices, the Japanese economy was able to rebound to its pre-war production levels by the mid-1950s and eventually became the world's second largest country in terms of GNP after a period of unprecedented economic growth rates. The post-war economy did not change dramatically until the oil shock of 1973. The two oil crises in the 1970s not only slowed economic growth rates but also forced economic restructuring.

Whereas oil prices had declined in the 1980s, the economic growth rate remained below the rate during the rapid growth period. A new business environment was brought about by the internationalization of the Japanese economy. Production and export of products such as automobiles, electric appliances, and precision instruments became the industrial core of the economy in order to compensate for the decrease in government expenditure.

This post oil-crisis economy continued until the Plaza Accord Agreement in the mid-1980s brought about a drastic appreciation in the Japanese yen. This, in turn, impacted Japan's economic structure through its effects on labor productivity and trade structure. In the long run, the appreciation of the Japanese yen translated into significant increases in the dollar value of Japanese exports, which decreased the profit margins of the major export manufacturers and eventually caused the Japanese economy to stagnate. In the short run until 1990, however, the economy expanded due to the decrease in the price of imports and low interest rates.

Changes in consumer preference and economic conditions have different effects on a regional economy depending on a region's industrial structure and resource endowments. This study focuses on the Kyushu region as a case to analyze the changes in the pattern of regional economic growth in Japan from 1965 to 1990. This study is based on 1965, 1970, 1975, 1980,

1985, and 1990 interregional input-output (I-O) tables. The study period is thus divided into 5 sub-periods: (1) 1965-70, (2) 1970-75, (3) 1975-80, (4) 1980-85, and (5) 1985-90. Specifically, the study employs the extended growth-factor decomposition method, which was developed by Akita (1999) based on a three-region interregional input-output (I-O) system, to identify the demand-side factors of regional economic growth for each sub-period.

There have been numerous studies on the sources of structural change and output growth in an I-O framework. They compare the I-O structure between two periods and try to identify the sources of structural change and growth in a comparative static framework.¹ Though the extent, the decomposition methodology, the focus, and the scope of analysis differ among the studies, they basically used the same technique. The Japanese government constructed survey-based nine-region interregional I-O tables every five years – one of the regions is Kyushu. In this study, all 23-sector current-price interregional I-O tables are converted into constant 1985 price tables (see Table 1 for the sector classification).

Kyushu is located in the southwestern part of Japan and the third largest of the four main islands. Kyushu is known as a so-called “Ten Percent National Economy”, since its leading economic indicators, e.g., population, land-area, gross domestic product, electric power consumption, annual retail sales volume, automobile ownership, and local government spending, all account for 9-12% of the national total. Since the Kyushu region is regarded as the best representative of pre-war economic development, it presents a very interesting case for analyzing regional economic development in Japan.

This paper is organized as follows. Section 2 discusses the characteristics of the Kyushu region and some government policies relevant to the region. Section 3 explains the extended

¹ For example, Akita (1991), Akita (1992), Akita (1994), Chenery (1980), Chenery and Syrquin (1979), Feldman et al. (1987), Holland and Cooke (1992), Kubo et al (1986), Lee and Schluter (1993), Martin and Holland (1992), Rose and Casler (1996), Skolka (1989), Sonis et al. (1996).

growth-factor decomposition method, which is employed in this study. Section 4 performs a growth-factor decomposition analysis for the Kyushu region, using the interregional I-O tables between 1965 and 1990. Conclusions are presented in section 5.

2. Characteristics of the Kyushu Economy

Kyushu is situated in the Northern Hemisphere between 27 to 35 degrees latitude. At 42.1 thousand square km, it occupies 11.2% of Japan's total landmass and is nearly the same size as the Netherlands (41.3 thousand square km) and Switzerland (41.2 thousand square km). The region is comprised of 7 prefectures: Fukuoka, Kumamoto, Nagasaki, Saga, Oita, Miyazaki, and Kagoshima. Total population is 13.3 million, and the resulting population density is 315 persons/km², about equal to the national average (320 persons/km²). Surrounded by the Pacific Ocean, the South China Sea, the Sea of Japan, and the Inland Sea, Kyushu has a long coastline and is rich in marine resources, and its agricultural sector includes 668 thousand hectares of cropland. Thus, Kyushu is a supplier of both agricultural and marine resources.

Fukuoka is the largest city in Kyushu with a population of 1.3 million people in 1999. This is followed by Kitakyushu (1.0 million), Kumamoto (0.64 million), Kagoshima (0.54 million), Oita (0.43 million), and Nagasaki (0.43 million). The northern Kyushu region, in particular, has increased in population to the point where it is regarded as the 4th largest metropolitan area after Tokyo, Osaka, and Nagoya.

Kyushu's natural resource endowments have had the primary influence on the region's economic structure. However, the regional economy not only has large natural resource industries (primary commodities and mining) but also advanced equipment and heavy industries, due to its proximity to the markets of East Asia. Kyushu's most abundant natural resources are coal and limestone. Kyushu has two main coal mining areas: Chikuho and Mitsui-miike. The former supplied the iron & steel works in Kitakyushu, and the latter supplied the coal-chemical

industrial complex in Kumamoto. Additionally, the high levels of precipitation in Kyushu facilitated the production of electricity, which was required in the production of caustic soda, aluminum, soda ash, and ammonium sulfates.

One of the characteristics of Kyushu's economy is the fact that it was the location for many of Japan's modern industries in the late Tokugawa and the Meiji period. Through government support, Nagasaki was the site of the first shipyard in Japan, which was built in 1857. Kitakyushu was the site of the state-owned Yawata Steel Works, which was established in 1901 and Japan's leading steel company. The coal-chemical complex was located at Ariake (Chisso Corporation) and Nobeoka (Asahi Chemical Industry Co., Ltd.). These manufacturing industries were critical to economic growth during the pre-war period in Japan.

Another characteristic of Kyushu's economy is its proximity to East Asia, an area with which the Kyushu economy had strong ties in the pre-war era. Iron ore was largely supplied from northern China and Korea, while ammonium sulfate was exported to the East Asian countries. Thus, Kyushu's pre-war industrial development was closely linked to nearby colonial economies through industrial materials production. In addition, during World War II, the military government regarded Kyushu as a strategic industrial trade center, since its steel, coal, and synthetic petroleum industries were given production priority.

Table 2 compares Kyushu with Japan as a whole according to major economic indicators for the period from 1965 to 1990. The Kyushu economy displays some of the following characteristics. First, after an initial decrease in population from 1965-1970, the population increased steadily after 1970. The First Comprehensive National Land Development Plan (implemented in 1962), while attempting to ameliorate regional imbalance in economic development, failed to halt the growing concentration of business activities in the Pacific coast industrial belt. In Kyushu, because of the shift in energy source from coal to oil, many coalfields

were shut down, and the unemployed coal industry workers were forced to out-migrate from Kyushu to the Pacific coast industrial belt. In addition, due to the depression in the mining industry, Kyushu's new graduates (ages 20-25) also out-migrated from Kyushu in order to seek job opportunities. Kyushu was a net supplier of labor during this period. In the 1970s, however, the decrease in the number of new graduates and an increase in the number of new plants locating in Kyushu completely reversed this trend: out-migration from Kyushu declined and in-migration to Kyushu increased. During the last half of 1970s, in-migrants consistently outnumbered out-migrants.

According to the Location Quotients (LQs) of output, Kyushu specialized in the primary and mining sectors, as these sectors' LQs have been consistently close to 2.0. This is true even though the output shares of those sectors decreased conspicuously over the period. Since Kyushu is abundant in natural resource, it is quite natural that it specializes in economic activities that make use of locally available natural resources. For example, Kyushu's 668,000 hectare cropland accounts for 18.0% of Japan's total cropland. Kyushu also has a comparative advantage in the fishing industry, including coastal fishing, deep-sea fishing, and aquaculture (fish-breeding industry). Surrounded by the Pacific Ocean, the East China Sea, the Sea of Japan, and the Inland Sea, Kyushu has ample access to water environments. Output in the fishing industry and aquaculture accounted for 23.3% and 33.0%, respectively, of the total 1990 national output in each industry (KERC 1999).

In addition, local-resource-based light industries such as food processing and wood processing are relatively prominent, reflecting the abundant supply of food and wood resources; this is in contrast with other manufacturing activities, for which the Kyushu economy continues to lack a solid base. The LQ for manufacturing activities remained below 0.8 from 1980 onwards. The main reason why the light-manufacturing sector did not increase its output share

is that most of the firms in these sectors are small, family-owned businesses that are usually terminated upon the owner's retirement due to the lack of a successor.

Output in the industrial materials sector, once the driving force in Kyushu's economic growth, leveled off in 1970. The Kyushu economy had been heavily reliant on the industrial materials sector; however, its importance was lessened by economic structural changes after the two oil crises and aggressive competition from the Newly Industrialized Countries. According to Table 2, the output share in the industrial materials sector peaked at 19.0% in 1970; afterwards, it steadily declined to 10.2% by 1990. The corresponding LQ also declined from 1.25 to 0.86 over the 25 years. As the following section will discuss, the two oil crises that occurred in the 1970s facilitated a structural shift from heavy and chemical industries toward the processing & assembling industries, e.g., semiconductor and automobile industries.

The abundance of mining resources such as coal and limestone had played an important role in the development of the industrial materials industry in Kyushu. A number of major multinational firms began their business in Kyushu, e.g., Bridgestone Corporation (Kurume), Nippon Steel Corporation (Kitakyushu), and Asahi Chemical Industry Co., Ltd. (Nobeoka). In the 1950s and 1960s, however, the importance of coal as an energy source was eclipsed by oil, which were imported from the Middle East by oil tankers. This greatly diminished the importance of Kyushu's mining resources. With the changes in the national industrial structure caused by the two oil crises, Japan's flagship industries, such as iron & steel and shipbuilding, fell into decline, and instead, higher value-added industries, such as electrical machinery and automobile, became the new flagship industries. Moreover, with the drastic appreciation of the yen in the late 1980s, the older flagship industries became uncompetitive internationally (Nakamura 1995).

The LQ for the processing & assembling sector had improved from 0.40 to 0.55 over the

25-year period, though this sector's output was comparatively less than other sectors. As companies sought land and labor for their new plants in the 1970s, this led to the decentralization of the megalopolises function and the dispersion of new plant location, which, in turn, contributed to the gradual increase in this sector's output in Kyushu region.

According to Table 3, by the 1980s, more than 15.0% of new plants were located in Kyushu, in which the main sector shifted from the local resource-based sector to the processing & assembling sector (Table 4). The share of the local resource-based sector decreased from 42.5% in 1970 to 29.6% in 1990, while the share of the processing & assembling sector increased from 27.5% to 40.5%.

The Kyushu economy has been dependent heavily upon public investment. According to the GDE figure in 1990, about 20% of the total GDE were due to the government sector (government consumption plus government capital formation); this was larger than the national average of 16.0%. This implies that the Kyushu economy is very sensitive to government policies, especially central government development policies.

Overall, Kyushu's trade structure reflects its basic economic condition: a region with abundant supplies of natural resources and a relatively low level of industrialization. Essentially, Kyushu exports primary commodities and foodstuffs, while it imports high value-added items. By using the interregional I-O tables, regional import ratio, regional export ratio, and the ratio of net regional export to total region trade (NE) can be calculated.² The ratio of net regional export to total regional trade measures the degree of a region's pattern of revealed comparative advantages and disadvantages. The measure ranges from -100 to +100.

There are four noteworthy conclusions that can be drawn from NE. First, as shown in Table

² Regional import ratio = regional imports / (total regional demand) × 100; regional export ratio = regional exports / (total output) × 100; and ratio of net regional export to total regional trade = (regional export - regional import) / (regional export + regional import) × 100.

5, NE of Kyushu region as a whole is negative throughout the study period, indicating Kyushu's consistent regional trade deficits. This reflects that the Kyushu economy is dependent heavily upon central government's public investment. Second, the primary and mining sectors maintained high NEs throughout the period, thus indicating Kyushu's comparative advantages in these sectors. In contrast, the manufacturing sector had a negative NE throughout the period, thus indicating that Kyushu had a comparative disadvantage in this sector. Third, NE in the light and industrial materials sectors remained negative, but their absolute values gradually declined over the study period. Fourth, the industrial materials sector had a positive NE in 1965. However, this became negative. The price hikes of crude oil and other raw materials in the 1970s forced dramatic changes in the trade structure of the iron & steel and chemical industries of Kyushu.

3. Method: Growth-Factor Decomposition Equation based on a Three-Region Interregional I-O System

In this section, we present the derivation of the growth-factor decomposition equation for a three-region interregional I-O system.

First, basic balance equations for interregional I-O accounts for three regions are described in matrix terms as:

$$\begin{bmatrix} X^L \\ X^R \\ X^S \end{bmatrix} = \begin{bmatrix} A^{LL} & A^{LR} & A^{LS} \\ A^{RL} & A^{RR} & A^{RS} \\ A^{SL} & A^{SR} & A^{SS} \end{bmatrix} \begin{bmatrix} X^L \\ X^R \\ X^S \end{bmatrix} + \begin{bmatrix} F^{LL} + F^{LR} + F^{LS} \\ F^{RL} + F^{RR} + F^{RS} \\ F^{SL} + F^{SR} + F^{SS} \end{bmatrix} + \begin{bmatrix} E^L \\ E^R \\ E^S \end{bmatrix} - \begin{bmatrix} M^L \\ M^R \\ M^S \end{bmatrix} \quad (1)$$

In this matrix, superscript L denotes the region in question, R the Kanto region, and S the other regions. X^K , E^K , and M^K are vectors of gross regional outputs, international exports, and international imports for region K (K = L, R, and S), respectively, whereas F^{KJ} is a vector of final demands of region J for goods and services in region K (J, K = L, R, and S). Finally, A^{KJ} is a matrix of regional input coefficients when K = J and a matrix of interregional trade coefficients when K ≠ J.

Now, we define the international import proportion of sector i in region K as

$$m_i^K = M_i^K / \left(\sum_{j=1}^n a_{ij}^{KK} X_j^K + F_i^{KK} \right) \quad (2)$$

where a_{ij}^{KK} is the (i,j) th element of the matrix A^{KK} , and X_i^K , M_i^K , and F_i^{KK} are the i th element of the vectors X^K , M^K , and F^{KK} , respectively ($K = L, R, \text{ and } S$; $i, j = 1, 2, \dots, n$). Then equation (1) can be transformed into

$$\begin{bmatrix} X^L \\ X^R \\ X^S \end{bmatrix} = \begin{bmatrix} \hat{p}^L A^{LL} & A^{LR} & A^{LS} \\ A^{RL} & \hat{p}^R A^{RR} & A^{RS} \\ A^{SL} & A^{SR} & \hat{p}^S A^{SS} \end{bmatrix} \begin{bmatrix} X^L \\ X^R \\ X^S \end{bmatrix} + \begin{bmatrix} \hat{p}^L F^{LL} + F^{LR} + F^{LS} \\ F^{RL} + \hat{p}^R F^{RR} + F^{RS} \\ F^{SL} + F^{SR} + \hat{p}^S F^{SS} \end{bmatrix} + \begin{bmatrix} E^L \\ E^R \\ E^S \end{bmatrix} \quad (3)$$

where $\hat{p}^K = I - \hat{m}^K$ is a diagonal matrix of domestic supply proportions for region K ($K = L, R, \text{ and } S$). In this equation, we implicitly assume that goods and services imported internationally into region K are not exported to the other regions.

Equation (3) is a system of simultaneous equations for gross outputs of three regions, for which the solution is given by:

$$X = (I - (\hat{P}A^a + A^b))^{-1} (\hat{P}F^a + F^b + E)$$

or

$$X = B(\hat{P}F^a + F^b + E) \quad (4)$$

where $B = (I - (\hat{P}A^a + A^b))^{-1}$ is the Leontief inverse net of international imports and

$$X = \begin{bmatrix} X^L \\ X^R \\ X^S \end{bmatrix}, E = \begin{bmatrix} E^L \\ E^R \\ E^S \end{bmatrix}, \hat{P} = \begin{bmatrix} \hat{p}^L & 0 & 0 \\ 0 & \hat{p}^R & 0 \\ 0 & 0 & \hat{p}^S \end{bmatrix}, F^a = \begin{bmatrix} F^{LL} \\ F^{RR} \\ F^{SS} \end{bmatrix}, F^b = \begin{bmatrix} F^{LR} + F^{LS} \\ F^{RL} + F^{RS} \\ F^{SL} + F^{SR} \end{bmatrix},$$

and

$$A^a = \begin{bmatrix} A^{LL} & 0 & 0 \\ 0 & A^{RR} & 0 \\ 0 & 0 & A^{SS} \end{bmatrix}, A^b = \begin{bmatrix} 0 & A^{LR} & A^{LS} \\ A^{RL} & 0 & A^{RS} \\ A^{SL} & A^{SR} & 0 \end{bmatrix}.$$

Using equation (4), changes in gross regional outputs can be represented as:

$$\begin{aligned}\Delta X &= X_t - X_0 \\ &= B_t(\hat{P}_t F_t^a + F_t^b + E_t) - B_0(\hat{P}_0 F_0^a + F_0^b + E_0)\end{aligned}\quad (5)$$

where subscripts 0 and t designate the base year and the terminal year, respectively, while Δ denotes a change over the period.

Next, we define

$$\Delta F^a = F_t^a - F_0^a, \Delta F^b = F_t^b - F_0^b, \text{ and } \Delta E = E_t - E_0. \quad (6)$$

Then, by substituting (6) into (5), we obtain

$$\Delta X = B_t[(\hat{P}_t \Delta F^a + \Delta F^b) + \Delta E] + B_t(\hat{P}_t - \hat{P}_0)F_0^a + (B_t - B_0)(\hat{P}_0 F_0^a + F_0^b + E_0) \quad (7)$$

$$\begin{aligned}\text{Since } B_t - B_0 &= B_t[(B_0)^{-1} - (B_t)^{-1}]B_0 \\ &= B_t[(\hat{P}_t - \hat{P}_0)A_0^a + \hat{P}_t(A_t^a - A_0^a) + (A_t^b - A_0^b)]B_0\end{aligned}$$

and considering $X_0 = B_0(\hat{P}_0 F_0^a + F_0^b + E_0)$, equation (7) becomes

$$\Delta X = B_t[(\hat{P}_t \Delta F^a + \Delta F^b) + \Delta E + \Delta \hat{P}(A_0^a X_0 + F_0^a) + (\hat{P}_t \Delta A^a + \Delta A^b)X_0] \quad (8)$$

where $\Delta \hat{P} = \hat{P}_t - \hat{P}_0$, $\Delta A^a = A_t^a - A_0^a$, and $\Delta A^b = A_t^b - A_0^b$. Equation (8) is the basic growth-factor decomposition equation for an interregional I-O model, in which there are four major growth components: $B_t(\hat{P}_t \Delta F^a + \Delta F^b)$ presents the direct and indirect effects of the expansion of domestic final demands; $B_t \Delta E$ the direct and indirect effects of the expansion of international exports; $B_t \Delta \hat{P}(A_0^a X_0 + F_0^a)$ the direct and indirect effects of changes in international import proportions; and $B_t(\hat{P}_t \Delta A^a + \Delta A^b)X_0$ the direct and indirect effects of changes in input-output coefficients.

For a three-region interregional I-O system, the Leontief inverse B_t is thought to be composed of nine submatrices. That is,

$$B_t = \begin{bmatrix} B_t^{LL} & B_t^{LR} & B_t^{LS} \\ B_t^{RL} & B_t^{RR} & B_t^{RS} \\ B_t^{SL} & B_t^{SR} & B_t^{SS} \end{bmatrix}.$$

Therefore, by expanding equation (8), we finally obtain the growth-factor decomposition equation for region L as follows:

$$\begin{aligned} \Delta X^L = & B_t^{LL} \left[\hat{p}_t^L \Delta F^{LL} + \Delta F^{LR} + \Delta F^{LS} + \Delta E^L + \Delta \hat{p}^L (A_0^{LL} X_0^L + F_0^{LL}) \right] + \hat{p}_t^L \Delta A^{LL} X_0^L + \Delta A^{LR} X_0^R + \Delta A^{LS} X_0^S \\ & + B_t^{LR} \left[\Delta F^{RL} + \hat{p}_t^R \Delta F^{RR} + \Delta F^{RS} + \Delta E^R + \Delta \hat{p}^R (A_0^{RR} X_0^R + F_0^{RR}) \right] + \Delta A^{RL} X_0^L + \hat{p}_t^R \Delta A^{RR} X_0^R + \Delta A^{RS} X_0^S \\ & + B_t^{LS} \left[\Delta F^{SL} + \Delta F^{SR} + \hat{p}_t^S \Delta F^{SS} + \Delta E^S + \Delta \hat{p}^S (A_0^{SS} X_0^S + F_0^{SS}) \right] + \Delta A^{SL} X_0^L + \Delta A^{SR} X_0^R + \hat{p}_t^S \Delta A^{SS} X_0^S \end{aligned} \quad (9)$$

Note that

$$\Delta A^{LL} = \Delta A^L - \Delta A^{RL} - \Delta A^{SL} \quad (10)$$

where A^L is a matrix of technical coefficients for region L. Therefore, a change in the regional input coefficients is the difference between a change in the technical coefficients and a change in the interregional trade coefficients.

We may use the term “direct effects” for the factors in the first square bracket (first line in equation (9)) since they affect the level of region L outputs directly. Consequently, we may use the term “indirect effects” for those in the second and third square brackets (second and third lines in equation (9)) since they affect the output level indirectly, i.e., through interregional open-loop multiplier effects (Round, 1985 and 1989). It should be noted that B_t^{LL} , B_t^{LR} and B_t^{LS} include not only intra-regional multiplier effects but also interregional feedback effects or interregional closed-loop multiplier effects. According to Miyazawa (1976) and Sonis and Hewings (1993), these are, respectively, internal and external matrix multipliers.

The growth-factor decomposition equation (8) is obtained by using the terminal year structural parameters, B_t and \hat{P}_t , and the base year volume weight, X_0 . However, we can also derive a growth-factor decomposition equation based on the base year structural parameters, B_0 and \hat{P}_0 , and the terminal year volume weight, X_t , as follows:

$$\Delta X = B_0 \left[\left(\hat{P}_0 \Delta F^a + \Delta F^b \right) + \Delta E + \Delta \hat{P} \left(A_t^a X_t + F_t^a \right) + \left(\hat{P}_0 \Delta A^a + \Delta A^b \right) X_t \right] \quad (11)$$

Here, there is an index number problem, so that this study uses a simple average of these two equations, (8) and (11) (see Kubo, Robinson and Syrquin, 1986).

Using equation (9), we can identify eight major factors for the output growth of region L:

(a) effects from within the region due to changes in the regional final demand (DD):

$$B_t^{LL} \hat{p}_t^L \Delta F^{LL};$$

(b) effects from within the region due to changes in the regional input-output coefficients (IO),

$$B_t^{LL} \hat{p}_t^L \Delta A^{LL} X_0^L;$$

(c) effects of the expansion of international exports from the region (EE), $B_t^{LL} \Delta E^L$;

(d) effects of changes in international import proportions in the region (IS),

$$B_t^{LL} \Delta \hat{p}^L \left(A_0^{LL} X_0^L + F_0^{LL} \right).$$

(e) direct effects from the Kanto region, $B_t^{LL} \left(\Delta F^{LR} + \Delta A^{LR} X_0^R \right)$;

(f) indirect effects from the Kanto region, i.e., the terms with B_t^{LR} in equation (9);

(g) direct effects from the other regions, $B_t^{LL} \left(\Delta F^{LS} + \Delta A^{LS} X_0^S \right)$; and

(h) indirect effects from the other regions, i.e., the terms with B_t^{LS} in equation (9).

It should be noted that growth factor (b) measures the effects of interregional import substitution and can be further decomposed, by using equation (10), into effects due to changes

in the technical coefficients $(B_t^{LL} \hat{p}_t^L \Delta A^L X_0^L)$ and effects due to changes in the interregional trade coefficients $(-B_t^{LL} \hat{p}_t^L (\Delta A^{RL} + \Delta A^{SL}) X_0^L)$.

In summary, the extended growth-factor decomposition equation developed for an interregional I-O system can analyze, explicitly, the roles played by interregional linkages as well as inter-industry linkages in the growth of a regional economy. It can identify growth factors that originate outside a region as well as those that originate from within. Furthermore, the extended formula for the three-region system allows us to capture the particular effects from the Kanto region as distinct from the rest of Japan.

4. Data and Major Findings

The Ministry of International Industry & Trade (MITI) constructed nine-region interregional I-O Tables for Japan in 1965, 1970, 1975, 1980, 1985, and 1990 (MITI, various issues). The 1965 and 1970 tables include, from north to south, Hokkaido, Tohoku, Kanto, Tokai, Hokuriku, Kinki, Chugoku, Shikoku, and Kyushu. In the 1975, 1980, 1985, and 1990 Tables, Tokai and Hokuriku were merged into one region (Chubu), while Okinawa was newly added. In order to conduct an extended growth-factor decomposition analysis for Kyushu, this study constructed three-region interregional I-O tables, where three regions are Kyushu, Kanto, and the other regions that include Hokkaido, Tohoku, Tokai, Hokuriku, Kinki, Chugoku, and Shikoku. It should be noted that all tables are converted into constant 1985 prices by using sectoral output deflators or inflators.

The study period from 1965 to 1990 is divided into five sub-periods: 1965-70, 1970-75, 1975-80, 1980-85 and 1985-90. Tables 7 through 11 provide the results obtained from the extended growth-factor decomposition analysis. Each entry in the upper table is the absolute growth for each growth factor and for each sector. Each entry in the lower table presents the

proportional contribution of each factor and each sector to total regional output growth. In order to see the differences in growth performance between regions, Table 12 compares Kyushu with other regions in terms of real regional output growth.

4.1. Growth Factors of Kyushu Region: 1965-1970

There are three noteworthy observations in this period. First, Kanto and the other regions played rather important roles in Kyushu's economic growth. The effect of Kanto and the other regions accounted for one-third of total regional output growth. It should be noted that Kyushu's output growth of 11.3% was much smaller than the national output growth of 14.1 %. Therefore, Kyushu's output growth in this period was brought about, to a considerable extent, by the rapid output growth of Kanto and some other regions through indirect effects, i.e., interregional open-loop multiplier effects.

Second, the main source of Kyushu's output growth was the expansion of the regional final demand (DD), accounting for 66 % of total output growth, to which the construction sector and the finance, real estate, and service sector contributed 40 percentage points. This indicates that household consumption and public investment expenditures within Kyushu also played a significant role in Kyushu's output growth in this period.

Third, the industrial materials sector had a relatively higher rate of output growth (13.4%) than Kyushu's total output growth rate (11.3%), but over 85% of this sector's growth was due to indirect effects from Kanto and the other regions. This implies that the linkages between Kyushu's industrial materials sector and the other sectors were not very strong in this period.

The Japanese economy experienced spectacular economic expansion in 1965-70, the so-called "*Izanagi Boom*", which lasted for 57 months starting from October 1965. Doubling the

National Income Plan³, which emphasized social infrastructure and human resources in order to increase labor force mobility toward high productivity activities, played a major role in the high economic growth rates. The plan accelerated heavy industrial accumulation on the Pacific coast industrial belt, covering the metropolises of Tokyo, Nagoya, and Osaka (Ueno 1996).

In terms of real output growth, Kyushu grew at 11.3% per annum, while Kanto, Kinki, and Chugoku grew at 14.0% or higher. In 1962, the First Comprehensive National Land Development Plan was formulated in an attempt to encourage more evenly distributed industrial and urban development, with a particular focus on areas outside the Pacific coast industrial belt. In conjunction with this plan, the cities of Oita, Hyuga, Nobeoka, Ariake, Shiranui, and Ohmuta in the Kyushu region were designated as New Industrial Cities in 1964. It was proposed that these areas should serve as strategic regional poles for industrial development in Kyushu, and the steel, pulp and paper, chemical products, and machinery sectors were designated as promotion sectors in these areas (KERC 1981).

4.2. Growth Factors of Kyushu Region: 1970-1975

There are two main observations in this period. First, the expansion of regional final demand (DD) was the dominant source of output growth in this period, increasing its contribution to total output growth from 66.0 % in the previous period to 80.9%, to which the construction sector and the finance, real estate, and service sectors contributed 48 percentage points. This indicates that household consumption and public investment expenditures within Kyushu were the main drivers of Kyushu's economic growth in this period, just as they were in the preceding period.

Second, the contribution of indirect effects from Kanto and the other regions were far

³ Doubling the National Income Plan was an economic plan during the Japan's rapid growth period. The plan was designed to double real national income from 1961 to 1970 (Nakamura 1995).

smaller than the previous period; Kanto's indirect effects decreased from 12.8% to 3.2%, while the other regions' indirect effects decreased from 20.4% to 6.7%. Interregional open-loop multiplier effects from Kanto and the other regions diminished as the growth rates of Kanto and the other regions dropped to around 4-5 %, which compared to Kyushu's growth rate of 5.5%.

In 1970s, the Japanese economy was faced with a succession of problems and major changes; the end result was a period of stable growth in contrast to the preceding two decades of rapid economic growth. Especially in the first half of the 1970s, many changes occurred in rapid succession (Nakamura 1995; Kosai 1986). The Japanese government was forced to switch to the floating exchange rate system in February 1973 in the aftermath of the so-called "Nixon Shocks" which took place in August 1971. Expansive monetary and fiscal policies were adopted from the late 1960s to the early 1970s in order to stem the recession following the "*Izanagi Boom*," to achieve international payment balance, to counteract the impact of the "Nixon Shocks" (i.e., buying up dollars on a large scale to avoid a revaluation of the Yen), and to implement the "Plan for Rebuilding the Japanese Archipelago⁴."

The first oil crisis in October 1973 brought about a four-fold increase in the dollar price of crude oil. Combined with an extraordinary "easy money" policy, which had been prevalent until early 1973, this triggered rampant inflation in 1973-74. This effectively put an end to the era of high economic growth.

In contrast, the Kyushu economy in this period enjoyed "the Second Economic Boom" in which it grew at an annual average rate of 5.5% in contrast to the nationwide average growth rate of 4.0%. The boom was accompanied by the diffusion of industrial development as

⁴ Plan for Rebuilding the Japanese Archipelago was officially named the "Basic Economic and Social Plan" by Prime Minister Kakuei Tanaka who took office in 1972. The plan assumed that a 10-percent annual rate of growth could be continued through 1985. It attempted to eliminate regional inequality by relocating industry from the Pacific coast industrial belt to the interior and the Sea of Japan coast by linking the entire nation with 9,000

envisioned by the Second Comprehensive National Land Development Plan (*Shinzenso*)⁵ of 1969. The *Shinzenso* proposed large-scale development projects such as the construction of new networks of trunk railway lines, expressways, and communications and the establishment of large-scale industrial bases around the new networks, especially in the remote areas of Japan.

In Kyushu, the development diffusion policy accelerated the construction of the transportation network. By 1975, the Shinkansen (bullet train) railway was extended to Hakata (Fukuoka City), which is the most densely populated Metropolis in the Kyushu region, and the Kyushu Expressway was built between Fukuoka and Kumamoto, which are the two core cities in northern Kyushu. The upgraded transportation infrastructure promoted private business investment in the Kyushu region. According to Table 3 (New Plant Location Survey), 63.5% of new plants were located along the Pacific coast industrial belt, which includes the regions of Kanto, Chubu, and Kinki, in the period from 1967 to 1970. The comparable figure in remote areas such as Kyushu and Tohoku are relatively lower at 12.3% and 8.7%, respectively. In the period from 1971 to 1975, a significantly larger percentage of new plants were located in the remote areas (13.7% in Kyushu and 19.4% in Tohoku). According to Table 4, these new plants were not limited to the traditionally strong industrial materials sector but included a variety of different manufacturing sectors, e.g., processing & assembling sector. This was an indication of a structural shift away from primary dependence upon the industrial materials sector to the growing importance of the processing & assembling sector in the Kyushu economy. The industrial relocation to Kyushu also greatly increased employment opportunities and resulted in

kilometers of Shinkansen (bullet train) railways, 10,000 kilometers of superhighways, and 7,500 kilometers of oil pipelines.

⁵ Second (New) Comprehensive National Land Development Plan was adopted in 1968. Its overall objective was to create a richer environment for human life. The plan devised two new development strategies: large-scale projects and wide living zones. The large-scale project strategy envisaged the creation of nation-wide networks of physical distribution and information systems. The wide living zones were drawn up, and national standards of living environments with respect to safety and amenities were to be secured within the zones by improving transportation, communication, and other facilities related to people's everyday lives. (Nakamura 1995)

a greater number of in-migrants than out-migrants in 1975; this was the first time since 1954.

4.3. Growth Factors of Kyushu Region: 1975-1980

Although the primary source of Kyushu's output growth is the expansion of regional final demand (DD), accounting for 51 % of total output growth, there are two notable differences in the pattern of output growth from the previous periods. First, the contribution of direct effects from Kanto and the other regions increased markedly during this period (from -2.8% in 1970-75 to 9.3% in 1975-80 for Kanto; and from 2.3% in 1970-75 to 16.0% in 1975-80 for the other regions). This indicates an increase in interregional interdependence between Kyushu and the other regions, including Kanto. On the other hand, the effects of the expansion of regional final demand (DD) decreased significantly in construction (from 18.8% to 11.7%) and finance, real estate, service (from 29.4% to 16.8%).

Second, direct effects from within the Kyushu region on the industrial materials sector were negative (-4.8%), despite the fact that the sector achieved an annual average growth rate of 3.4%. This signifies that direct and indirect effects from Kanto and the other regions were responsible for the growth of Kyushu's industrial materials sector. As indicated by negative IO and IS components for the industrial materials sector, substitution of regionally produced goods for (regionally and internationally) imported intermediate goods have been occurring in this period in the industrial materials sector and its related sectors.

As Table 12 shows, Kyushu's real output growth was lower in 1975-80 than in the previous period (4.0% versus 5.5%); in contrast, national output growth increased slightly from 4.0% to 4.3%. A sharp rise in energy prices severely damaged the Kyushu economy, which is dependent upon high energy-intensive industries, e.g., open-hearth and electric furnaces and aluminum refining. During the rapid growth period, the heavy and chemical industries were the main engines of growth. However, high-energy prices substantially changed this pattern. The

industrial materials sector in Kyushu, including iron & steel, petrochemical, oil refining, and aluminum smelting, experienced stagnation as profitability in each of these industries substantially decreased.

The Kyushu economy, highly dependent upon the industrial materials sector, experienced large-scale structural adjustment. Major industrial sectors in Kyushu were designated as structurally depressed industries under the Industry Stabilization Law⁶. As a result, major manufacturing companies in Kyushu shut down their factories and plants and drastically reduced the number of employees.

4.4. Growth Factors of Kyushu Region: 1980-1985

There are three notable observations in this period. First, direct and indirect effects from Kanto and the other regions accounted for 83.6% of total output growth in Kyushu. Combined with the effects of the expansion of international exports, 90% of output growth were driven by factors outside the Kyushu region. The contribution of direct effects from Kanto (22.4%) and the other regions (33.4%) was much larger than the indirect effects from Kanto (14.7%) and the other regions (13.1%). This indicates a further strengthening of interregional industrial linkages between Kyushu and the other regions including Kanto.

Second, the contribution of the industrial materials sector was negative (-5.8%) whereas the contribution of the processing & assembling sector became the third largest among all sectors at 25.3%. The negative contribution of the industrial materials sector was mainly due to a large negative effect of the changes in regional input-output coefficients (IO) (-12.4% of Kyushu's total output growth). The scrapping and disposal of excess plant and equipment in the

⁶ Under the Industry Stabilization Law, a total of 14 industries were designated as depressed industries, which included shipbuilding, cardboard, open-hearth and electric furnaces, continuous nylon fibers, discontinuous acryl fibers, continuous and discontinuous polyester, urea, aluminum smelting, etc. The goal was to suspend and scrap capacity in the designated industries (Sekiguchi and Horiuchi 1988).

designated structurally depressed industries were the main causes of stagnation in this sector. In contrast, the high rate of growth in the processing & assembling sector was driven by factors outside the Kyushu region. In 1985, for example, the production of integrated circuits (IC) totaled approximately ¥548.5 billion in Kyushu, or 30% of total national production; this was a four-fold increase from 1980. IC products were intermediate goods for assembling plants located outside the Kyushu region. Therefore, the growth of this industry is indicative of the expansion of interregional industrial linkages. In addition, it indicates a major shift in industrial structure from the heavy and chemical industry to the processing & assembling industry.

Third, the effects of the expansion of regional final demand (DD) on the output growth of the construction sector, formerly a major source of growth in the Kyushu region, precipitously declined to -16.2 % from 11.7% in the previous period. This decline is the direct result of changes in national fiscal policy during the late 1970s and early 1980s (Nakamura 1995). In 1981, the government reversed the radical stimulus policy and implemented administrative and fiscal reconstruction instead. In 1975, faced with revenue shortages after the first oil crisis, the government decided to issue deficit-financing bonds to cover the fiscal deficits. Simultaneously, in an attempt to recover from the recession, the government adopted a radical stimulus policy in which national bonds were issued to finance increased public works expenditure. The total amount of national bonds issued grew rapidly and reached ¥10 trillion in 1978 (versus ¥2.2 trillion in 1974), accounting for more than 30% of total government revenue. In order to cope with this situation, the government initiated fiscal reconstruction in 1981 by setting up a Provisional Commission for Administrative Reform, which was charged with reorganizing administrative and government finances. In conjunction with this reconstruction, which aimed at reducing the fiscal deficit and terminating the issue of deficit financing bonds by 1984, public works expenditures by the central government were completely frozen. Highly dependent on

central government expenditures, the Kyushu economy was thus severely affected by this freeze.

4.5. Growth Factors of Kyushu Region: 1985-1990

There are three important observations during this period. First, the direct and indirect effects from Kanto and the other regions remained a major source of total output growth at 25.0% and 28.6%, respectively. However, the effect of the expansion of regional final demand (DD) still accounted for the largest share at 68.7%. Second, the effects of the changes in regional input-output coefficients and international import proportions were negative at -12.6% and -13.0%, indicating an increasing substitution of imported goods (either interregionally or internationally) for regionally produced goods. Third, the effect of the expansion of regional final demand (DD) contributed conspicuously to the construction sector (14.2% of Kyushu's total output growth). This seems to have been due to the low financial costs and deliberate policies favoring land development.

On September 22, 1985, the Plaza Accord Agreement was signed, aiming at 10-12 percent depreciation in the value of the dollar against the Japanese yen and the Deutsche mark. However, the dollar did not stop depreciating to the informally agreed reduction level of 10-12 percent. Instead, the yen continued to appreciate until the beginning of 1988, when it reached 120 yen to the dollar. In the early stages, the yen appreciation negatively affected profitability in export industries and resulted in the “High-Yen Recession” for the fiscal years of 1986-87. The long-term effect of an appreciated yen was the transfer of many industries’ parts-production bases to Southeast Asian countries such as Thailand and Malaysia with lower labor costs. As documented by a Ministry of Finance study on the overseas business activities of Japanese firms, direct investment in manufacturing in these countries during the period of 1986-90 experienced a five-fold increase from the previous period. The high value of the yen also caused exports to

stagnate; this, of course, resulted in a lower rate of growth for Kyushu's international exports, as indicated by a smaller effect of the expansion of international exports (EE) (from 8.0% in 1980-85 to 3.2% in 1985-90).

The government continued its low interest rate policy during the "High-Yen Recession" from 1986 until 1989. Market interest rates followed suit, thus causing not only equipment investment to peak but also rampant speculation in financial assets and real estate. According to statistics from the Japan Real Estate Research Institute, nationwide urban land prices had increased by an average of 1.6 times from 1985, while land prices in six major cities rocketed to an average three-fold and even four-fold in certain business districts. The rise in land prices escalated first in urban business districts and then gradually spread into outlying areas (Nakamura 1995).

In 1987, the Fourth National Land Development Plan was approved; its goal was to create many different "nodes" of development around the country. Once again, the decentralization of industrial clusters became important, and the Kyushu region, a traditionally sparsely industrialized zone, stood to benefit from the Plan. According to Table 4, which shows new plant locations by region, Kyushu's share in 1986-90 was the same as in 1975-80, when it enjoyed "the second Economic Boom." Under the comprehensive Recreation Area Development Act⁷, the Miyazaki-Nichinan Resort Development Project was approved in 1988 and additional resort development projects were later located throughout the Kyushu region. The resort development boom was responsible, to a considerable extent, for the increase in the effect of the expansion of regional final demand (DD) on the construction sector (KERC 1992).

⁷ The comprehensive Recreation Area Development Act was enacted by the Diet in 1987. The Act provided new impetus for rural development and better utilization of local resources through the growth of tourism and other leisure activities through their incorporation into daily life. As a result, local governments or private companies throughout the country started many resort development projects (Ueno 1996).

5. Conclusion

By using the Kyushu region as a case study, the primary purpose of this paper was to investigate the effects of regional characteristics and government policies on the growth of a regional economy in Japan. It has been found that the growth pattern of the Kyushu economy changed noticeably in the late 1970s and the late 1980s: the primary drivers of growth changed from final demand within Kyushu to the direct and indirect effects from outside regions. This implies unambiguously that the Kyushu economy facilitated interregional and international interdependence.

The change in the pattern of growth was largely caused by the decentralization of the major industrial zones during the period of structural adjustment. After the oil crises in the 1970s, Kyushu's industrial structure shifted from an emphasis on heavy and chemical industries to the processing & assembling industries. The national economic policies at the time also favored the development of the IC and automobile industries' multi-layer structure in Kyushu, both of which promoted linkages with and increased production in Kyushu's existing industries, e.g., iron products, rubber, ceramics, and chemical products. Therefore, many of the industries that moved to Kyushu at that time belonged to the processing & assembling sector, the products of which served as intermediate goods in other regions' industries. Thus, the emergence of this sector forged closer interregional industrial linkages between Kyushu and the other regions.

Simultaneously, it is likely that the offshore transfer of production from Kyushu to Southeast Asia after the Plaza Accord Agreement and the appreciation of the yen strengthened Kyushu's international industrial linkages. Various indicators such as trade volume, international conferences, international passengers, foreign students, and registered foreigners indicate the growth of Kyushu's international linkages.

With the growing number of factories and plants in the processing & assembling sector and

the offshore transfer of plants and equipment, the Kyushu economy has a rich network of linkages with other regions as well as with other countries. However, it should be noted that this sector's functions are still limited to production activities on the lower-end of the value chain. Thus, the Kyushu economy needs to further develop its R&D and marketing industries in order to move up the value chain while increasing production.

Table 1. Sector Classification

Sector Classification		Sector Classifications	
1	Primary	1	Primary
2	Mining	2	Mining
3	Manufacturing	3	Food Processing
	3-1 Light	4	Textile
		5	Wood Processing
		6	Pulp & Paper
	3-2 Industrial Materials	17	Other Manufacturing
		7	Chemical Products
		8	Oil & Coal Products
		9	Cement & Ceramics
	3-3 Processing & Assembling	10	Iron
		11	Non-Ferrous Metal
		12	Metal Products
		13	Nonelect. Machinery
		14	Elect. Machinery
		15	Transp. Machinery
		16	Precision Apparatus
4	Construction	18	Construction
5	Electricity, Gas & Water	19	Electricity, Gas & Water
6	Trade	20	Trade
7	Finance, Real-estate, & Service	21	Finance, Real-estate, & Service
8	Transportation	22	Transportation
9	Unclassified	23	Unclassified

(Source) Ministry of International Trade & Industry, *Interregional Input-Output Table 1965, 1970, 1975, 1980, 1985, and 1990.*

Table 2. Major Economic Indicators for Kyushu and Japan

	Kyushu						Kyushu's Share in Japan					
	1965	1970	1975	1980	1985	1990	1965	1970	1975	1980	1985	1990
Land Area in 1,000km ²	42.1	42.1	42.1	42.1	42.1	42.1	11.2	11.2	11.2	11.2	11.2	11.2
Population in thousands	12,370	12,072	12,417	12,965	13,276	13,296	12.5	11.5	11.1	11.1	11.0	10.8
Pop. Density in Persons / km ²	294	286	295	308	315	315	111.8	103.4	99.4	99.3	98.3	96.4
Income in ¥ billion	2,474	5,140	13,827	23,035	28,115	36,938	9.2	8.3	9.1	9.4	8.6	8.2
Income per Capita in ¥1,000	200	426	1,114	1,777	2,118	2,778	73.6	72.2	82.3	84.5	78.7	76.3
Output (Sectoral Share in %)	Location Quotients											
1 Primary	12.6	7.4	6.9	5.8	5.6	4.8	1.70	1.78	1.87	1.96	2.13	2.31
2 Mining	1.9	1.8	0.8	0.8	0.6	0.5	2.27	2.88	1.76	1.78	2.14	1.96
3 Manufacturing	35.3	36.5	33.1	34.0	33.6	33.0	0.86	0.82	0.80	0.78	0.77	0.79
3-1 Light Industry	14.6	12.6	12.4	12.3	12.2	12.3	0.78	0.84	0.88	0.91	0.99	1.12
3-2 Industrial Materials	17.3	19.0	14.7	14.3	12.1	10.2	1.25	1.10	0.94	0.96	0.91	0.86
3-3 Processing & Assembling	3.4	4.8	5.9	7.4	9.3	10.6	0.40	0.41	0.51	0.49	0.52	0.55
4 Construction	11.1	11.3	12.7	12.8	9.7	10.2	0.96	0.98	1.13	1.21	1.16	1.10
5 Electricity, Gas & Water	2.6	2.6	2.8	3.2	3.4	3.5	1.00	1.01	0.98	1.06	1.11	1.17
6 Trade	6.2	6.6	7.6	9.2	8.7	9.6	0.84	0.88	0.92	0.95	0.96	1.00
7 Finance, real-estate, & Service	24.1	26.8	29.2	28.2	32.2	32.5	1.07	1.21	1.16	1.15	1.16	1.12
8 Transportation	4.5	4.9	4.9	4.8	4.8	5.0	0.88	0.98	0.97	1.16	1.19	1.29
9 Unclassified	1.6	2.2	1.9	1.4	1.3	0.9	1.05	1.02	1.01	0.99	1.05	1.01
Total	100.0	100.0	100.0	100.0	100.0	100.0	1.00	1.00	1.00	1.00	1.00	1.00

(Note) 1. Figures in 1965, and 1970 are from the *Annual Report on Prefectural Income Statistics*, 1979, and are based on old SNA figures, whereas figures for 1975, 1980, 1985, and 1990 are from the *Annual Report on Prefectural Accounts*, 1998, and are based on new SNA figures

2. Incomes are in nominal terms.

3. A Location Quotient is the ratio of the sectoral output share in Kyushu to the sectoral output share in Japan.

(Source) 1. Economic Planning Agency, 1979.

2. Economic Planning Agency, 1998.

3. Kyushu Economic Research Center, 1999.

4. Ministry of International Trade & Industry, *Interregional Input-Output Table 1965, 1970, 1975, 1980, 1985, and 1990*.

Table 3. New Plant Location by Region (No. of Plants, % Share)

Year	Japan	Shares by Regions									+	+	Tohoku	Kyushu
		Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku	Shikoku	Kyushu	Total				
1967	4,432	2.6	11.6	26.5	23.5	11.7	10.1	2.8	11.1	100.0				
1968	4,345	3.7	12.9	22.7	26.1	12.7	9.5	2.5	9.9	100.0				
1969	5,853	2.0	12.0	25.5	29.8	11.9	7.9	2.3	8.6	100.0	63.5	12.3	8.7	
1970	5,129	2.7	12.6	21.3	28.1	12.9	9.2	3.0	10.1	100.0				
1971	3,303	3.0	14.7	19.9	23.6	12.9	10.0	3.8	12.1	100.0				
1972	3,730	4.3	19.4	19.9	19.7	8.2	9.6	3.5	15.5	100.0				
1973	5,088	5.2	21.9	21.4	18.8	7.5	7.9	4.1	13.1	100.0	49.3	19.4	13.7	
1974	2,415	5.9	22.2	20.4	16.5	8.5	8.3	4.8	13.4	100.0				
1975	1,487	5.0	16.1	19.9	19.0	10.7	11.1	2.8	15.5	100.0				
1976	1,528	6.1	14.4	24.1	18.3	10.1	6.9	5.0	15.0	100.0				
1977	1,278	7.1	14.6	23.4	14.6	10.7	12.7	4.5	12.4	100.0				
1978	1,353	6.2	15.7	25.3	16.2	9.2	5.9	6.4	15.2	100.0	50.8	15.8	13.4	
1979	1,959	9.3	16.8	22.2	15.7	10.0	7.9	4.5	13.6	100.0				
1980	2,097	6.9	16.6	26.2	16.5	11.1	6.4	4.8	11.5	100.0				
1981	2,091	5.5	20.4	25.6	15.5	9.5	6.9	4.8	11.8	100.0				
1982	1,882	4.5	16.6	25.2	17.4	10.8	7.5	5.8	12.2	100.0				
1983	1,856	5.2	18.0	25.4	16.8	9.2	7.3	5.1	13.0	100.0	51.2	19.6	12.6	
1984	2,364	4.6	20.9	25.5	17.1	9.0	6.1	3.0	13.9	100.0				
1985	2,537	4.3	21.1	24.4	16.6	8.7	9.1	3.7	12.0	100.0				
1986	2,522	4.4	19.2	26.0	18.5	8.3	6.8	4.8	12.0	100.0				
1987	2,557	5.2	22.4	24.6	16.7	8.3	6.3	3.4	13.1	100.0				
1988	3,536	5.8	24.3	20.8	16.3	9.0	7.3	4.5	11.9	100.0	46.1	22.5	13.4	
1989	4,157	6.7	23.8	19.0	16.0	8.5	8.0	4.5	13.5	100.0				
1990	3,783	6.6	21.7	17.2	15.8	9.0	8.3	5.7	15.9	100.0				
1991	3,495	5.9	20.6	17.9	19.6	8.4	7.0	5.1	15.5	100.0				
1992	2,467	6.9	19.8	19.2	20.1	7.5	6.7	5.5	14.4	100.0				
1993	1,633	4.9	20.6	20.9	18.8	7.3	6.9	5.1	15.5	100.0	45.9	20.3	15.4	
1994	1,456	4.2	20.7	17.3	18.0	7.8	9.4	6.6	16.0	100.0				
1995	1,307	6.5	19.8	18.5	19.4	7.8	6.7	4.9	16.4	100.0				
1996	1,548	5.1	22.0	18.2	17.9	9.1	6.2	6.5	15.0	100.0				
1997	1,519	5.1	22.7	18.9	16.3	9.4	6.6	4.3	16.7	100.0				

(Source) Ministry of International Trade & Industry, *New Plants Location Survey*.

Table 4. New Plants Location by Industry (No. of Plants, % Share)

Unit: # of Plants,% Share

	Japan	Kyushu	Share	Local Resource	Miscellaneous	Base Material	Processing & Assembling	Electricity, Gas, Steam	Laboratory
	# of Plants			Plants	Plants	Plants	Plants	Plants	Not Included Total
1970	4,884	487	10.0	42.5	21.8	8.2	27.5	--	--
1975	1,487	225	15.1	41.8	14.7	8.0	35.1	0.4	--
1980	2,097	234	11.2	50.4	12.4	7.3	28.6	1.3	--
1985	2,537	265	10.4	36.2	14.3	8.7	40.0	0.8	0.8
1986	2,522	287	11.4	40.8	19.2	9.4	28.6	2.1	0.7
1987	2,557	310	12.1	42.9	27.4	3.9	25.2	0.6	1.3
1988	3,536	415	11.7	34.2	28.2	8.2	28.4	1.0	0.2
1989	4,157	545	13.1	29.4	27.2	5.3	36.9	1.3	--
1990	3,783	588	15.5	29.6	22.3	7.1	40.5	0.5	0.5
1991	3,495	532	15.2	23.3	20.7	5.6	50.0	0.4	0.8
1992	2,467	340	13.8	32.4	19.7	6.8	41.2	--	2.4
1993	1,633	239	14.6	31.8	20.1	6.3	39.7	2.1	0.4
1994	1,456	226	15.5	42.0	11.5	7.1	37.2	2.2	1.8
1995	1,307	207	15.8	40.1	18.8	5.8	32.4	2.9	1.9
1996	1,548	221	14.3	42.5	13.1	10.0	31.7	2.7	1.4
1997	1,520	242	15.9	43.0	12.4	5.8	37.6	1.2	2.5

(Source) Ministry of International Trade & Industry, *New Plants Location Survey*.

Table 5. Ratio of Net Regional Export To Total Regional Trade

		1965	1970	1975	1980	1985	1990
1	Primary Industry	72.6	59.7	68.1	65.5	64.4	51.4
2	Mining	60.8	55.9	46.9	40.6	78.3	86.1
3	Manufacturing	-18.3	-21.5	-32.7	-25.6	-20.4	-17.3
3-1	Light	-26.1	-26.1	-15.7	-14.0	-12.5	-3.7
3-2	Industrial Materials	11.4	-0.5	-34.2	-21.6	-17.4	-21.3
3-3	Processing & Assembling	-60.3	-50.8	-51.5	-45.2	-30.0	-22.8
4	Construction	0.0	0.0	0.0	0.0	0.0	0.0
5	Electricity, Gas & Water	100.0	0.0	-95.7	95.5	83.9	86.5
6	Trade	-61.0	-65.7	-52.0	-51.9	-33.3	-15.1
7	Finance, Real-estate, & Service	-28.7	-35.2	-6.2	4.3	-7.8	-37.3
8	Transportation	14.4	31.2	14.0	30.4	1.5	23.3
9	Unclassified	0.0	0.0	0.0	0.0	0.0	0.0
	Total	-5.7	-15.5	-21.1	-16.1	-14.0	-12.9

Source: Ministry of International Trade & Industry, *Interregional Input-Output Table 1965, 1970, 1975, 1980, 1985, and 1990*.

Table 6. Regional Export and Import Ratios

		Export Ratio						Import ratio					
		1965	1970	1975	1980	1985	1990	1965	1970	1975	1980	1985	1990
1	Primary Industry	28.3	28.3	31.6	34.5	32.0	37.3	5.2	7.7	6.7	8.2	7.9	14.2
2	Mining	44.5	40.0	38.8	33.2	37.5	26.2	7.3	5.5	5.0	5.1	1.5	0.8
3	Manufacturing	25.2	31.3	27.3	32.6	37.9	44.2	33.4	41.8	43.4	45.4	49.4	52.5
3-1	Light	19.2	23.5	28.2	31.5	33.7	36.6	28.5	33.8	33.6	36.1	38.2	35.3
3-2	Industrial Materials	29.4	34.3	25.5	32.9	37.1	42.2	25.8	35.1	42.4	43.4	46.7	51.8
3-3	Processing & Assembling	29.4	40.2	30.4	34.0	44.8	55.0	66.6	70.1	63.5	63.7	67.0	71.5
4	Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Electricity, Gas & Water	2.8	0.0	0.1	1.3	2.6	3.0	0.0	0.0	2.3	0.0	0.2	0.2
6	Trade	5.3	3.8	4.4	5.0	18.2	35.4	19.0	16.2	12.7	14.3	31.4	42.9
7	Finance, Real-estate, & Service	2.7	2.6	3.6	4.6	5.3	4.6	4.8	5.3	4.0	4.2	6.2	9.6
8	Transportation	4.7	12.7	16.6	15.6	26.5	38.3	3.6	7.1	12.9	9.5	27.8	28.1
9	Unclassified	0.0	0.0	0.8	1.3	53.8	0.0	0.0	0.0	0.1	0.3	48.3	0.0
	Total	14.6	15.6	13.4	15.2	19.9	23.5	15.8	19.7	18.9	19.5	24.7	28.0

Source: Ministry of International Trade & Industry, *Interregional Input-Output Table 1965, 1970, 1975, 1980, 1985, and 1990*.

Table 7. Sources of Output Growth: 1965-70

(In Billion Yen)

Industry	Direct Effect within Kyushu					Direct & Indirect Effects from Kanto			Direct & Indirect Effects from the Other Regions			Total	Growth Rate
	DD	IO	IS	EE	Sub-Total1	Direct	Indirect	Sub-Total2	Direct	Indirect	Sub-Total3		
1	202.9	-312.4	-126.6	44.0	-192.1	23.8	112.2	136.0	-140.1	200.7	60.5	4.4	0.0
2	46.6	-78.7	-57.1	31.9	-57.3	73.6	93.4	166.9	-85.5	169.8	84.3	193.9	9.3
3	1,461.6	-249.7	-16.4	592.4	1,787.8	299.1	1,121.9	1,420.9	-120.0	1,787.0	1,667.1	4,875.8	12.0
3-1	594.3	117.3	-20.5	35.1	726.2	98.7	144.1	242.8	76.1	220.7	296.8	1,265.7	8.2
3-2	565.5	-363.7	15.4	460.7	677.8	101.0	895.6	996.6	-370.7	1,436.9	1,066.2	2,740.7	13.4
3-3	301.9	-3.4	-11.4	96.7	383.9	99.4	82.2	181.6	174.6	129.4	304.0	869.5	19.1
4	1,466.6	-6.8	-3.0	4.9	1,461.7	4.8	10.1	14.9	-1.3	16.6	15.2	1,491.9	11.8
5	255.8	-62.8	-6.6	20.7	207.0	15.2	49.7	64.9	-25.4	83.5	58.1	330.0	11.4
6	705.4	61.5	-4.8	43.1	805.2	27.2	38.5	65.7	-21.0	60.1	39.1	910.0	12.7
7	3,599.2	-37.8	-23.8	44.5	3,582.1	55.6	101.7	157.3	12.9	150.5	163.4	3,902.8	13.7
8	533.2	-116.8	-33.9	49.5	432.0	41.2	72.6	113.8	61.6	89.5	151.1	696.9	13.1
9	173.0	97.0	-13.0	32.6	289.6	10.9	32.9	43.8	-3.3	54.0	50.7	384.1	18.8
Total	8,444.4	-706.5	-285.3	863.5	8,316.1	551.4	1,632.9	2,184.3	-322.2	2,611.8	2,289.6	12,790.0	11.3

(% Share)

Industry	Direct Effect within Kyushu					Direct & Indirect Effects from Kanto			Direct & Indirect Effects from the Other Regions			Total
	DD	IO	IS	EE	Sub-Total1	Direct	Indirect	Sub-Total2	Direct	Indirect	Sub-Total3	
1	1.6	-2.4	-1.0	0.3	-1.5	0.2	0.9	1.1	-1.1	1.6	0.5	0.0
2	0.4	-0.6	-0.4	0.2	-0.4	0.6	0.7	1.3	-0.7	1.3	0.7	1.5
3	11.4	-2.0	-0.1	4.6	14.0	2.3	8.8	11.1	-0.9	14.0	13.0	38.1
3-1	4.6	0.9	-0.2	0.3	5.7	0.8	1.1	1.9	0.6	1.7	2.3	9.9
3-2	4.4	-2.8	0.1	3.6	5.3	0.8	7.0	7.8	-2.9	11.2	8.3	21.4
3-3	2.4	0.0	-0.1	0.8	3.0	0.8	0.6	1.4	1.4	1.0	2.4	6.8
4	11.5	-0.1	0.0	0.0	11.4	0.0	0.1	0.1	0.0	0.1	0.1	11.7
5	2.0	-0.5	-0.1	0.2	1.6	0.1	0.4	0.5	-0.2	0.7	0.5	2.6
6	5.5	0.5	0.0	0.3	6.3	0.2	0.3	0.5	-0.2	0.5	0.3	7.1
7	28.1	-0.3	-0.2	0.3	28.0	0.4	0.8	1.2	0.1	1.2	1.3	30.5
8	4.2	-0.9	-0.3	0.4	3.4	0.3	0.6	0.9	0.5	0.7	1.2	5.4
9	1.4	0.8	-0.1	0.3	2.3	0.1	0.3	0.3	0.0	0.4	0.4	3.0
Total	66.0	-5.5	-2.2	6.8	65.0	4.3	12.8	17.1	-2.5	20.4	17.9	100.0

Table 8. Sources of Output Growth: 1970-75

(In Billion Yen)

Industry	Direct Effect within Kyushu					Direct & Indirect Effects from Kanto			Direct & Indirect Effects from the Other Regions			Total	Growth Rate
	DD	IO	IS	EE	Sub-Total1	Direct	Indirect	Sub-Total2	Direct	Indirect	Sub-Total3		
1	254.7	-106.5	-37.7	-33.5	77.0	63.7	41.5	105.2	254.0	67.9	321.9	504.2	4.1
2	23.4	50.4	-65.4	4.7	13.1	-140.4	16.2	-124.2	-139.6	48.1	-91.5	-202.6	-8.9
3	1,402.1	-16.8	-154.2	694.8	1,925.9	-274.0	158.2	-115.8	-118.1	385.0	267.0	2,077.0	3.4
3-1	634.4	-28.8	-122.5	0.2	483.3	136.3	33.2	169.5	374.0	93.3	467.3	1,120.0	5.2
3-2	457.1	-107.3	-41.1	386.4	695.2	-450.9	106.6	-344.3	-540.5	246.4	-294.2	56.8	0.2
3-3	310.6	119.3	9.4	308.1	747.4	40.6	18.3	59.0	48.5	45.3	93.8	900.2	9.9
4	1,776.8	-158.9	-2.0	4.0	1,619.9	0.2	1.7	2.0	4.3	3.1	7.4	1,629.3	7.9
5	246.4	110.4	-8.4	17.1	365.5	-20.8	7.2	-13.7	-19.1	17.8	-1.3	350.5	7.6
6	790.1	153.1	-31.0	25.7	937.8	-9.5	8.5	-1.1	70.5	17.8	88.3	1,025.1	8.5
7	2,781.0	436.2	-31.3	56.4	3,242.4	24.0	30.8	54.8	169.6	49.3	218.9	3,516.1	7.4
8	261.4	51.9	-38.4	41.4	316.3	99.9	34.1	134.0	-14.1	30.9	16.8	467.1	5.5
9	117.4	-110.5	-29.6	95.8	73.2	-4.1	5.4	1.3	7.3	11.6	18.9	93.4	2.7
Total	7,653.3	409.2	-397.9	906.6	8,571.2	-261.1	303.7	42.5	214.8	631.6	846.5	9,460.2	5.5

(% Share)

Industry	Direct Effect within Kyushu					Direct & Indirect Effects from Kanto			Direct & Indirect Effects from the Other Regions			Total
	DD	IO	IS	EE	Sub-Total1	Direct	Indirect	Sub-Total2	Direct	Indirect	Sub-Total3	
1	2.7	-1.1	-0.4	-0.4	0.8	0.7	0.4	1.1	2.7	0.7	3.4	5.3
2	0.2	0.5	-0.7	0.0	0.1	-1.5	0.2	-1.3	-1.5	0.5	-1.0	-2.1
3	14.8	-0.2	-1.6	7.3	20.4	-2.9	1.7	-1.2	-1.2	4.1	2.8	22.0
3-1	6.7	-0.3	-1.3	0.0	5.1	1.4	0.4	1.8	4.0	1.0	4.9	11.8
3-2	4.8	-1.1	-0.4	4.1	7.3	-4.8	1.1	-3.6	-5.7	2.6	-3.1	0.6
3-3	3.3	1.3	0.1	3.3	7.9	0.4	0.2	0.6	0.5	0.5	1.0	9.5
4	18.8	-1.7	0.0	0.0	17.1	0.0	0.0	0.0	0.0	0.0	0.1	17.2
5	2.6	1.2	-0.1	0.2	3.9	-0.2	0.1	-0.1	-0.2	0.2	0.0	3.7
6	8.4	1.6	-0.3	0.3	9.9	-0.1	0.1	0.0	0.7	0.2	0.9	10.8
7	29.4	4.6	-0.3	0.6	34.3	0.3	0.3	0.6	1.8	0.5	2.3	37.2
8	2.8	0.5	-0.4	0.4	3.3	1.1	0.4	1.4	-0.1	0.3	0.2	4.9
9	1.2	-1.2	-0.3	1.0	0.8	0.0	0.1	0.0	0.1	0.1	0.2	1.0
Total	80.9	4.3	-4.2	9.6	90.6	-2.8	3.2	0.4	2.3	6.7	8.9	100.0

Table 9. Sources of Output Growth: 1975-80

(In Billion Yen)

Industry	Direct Effect within Kyushu					Direct & Indirect Effects from Kanto			Direct & Indirect Effects from the Other Regions			Total	Growth Rate
	DD	IO	IS	EE	Sub-Total1	Direct	Indirect	Sub-Total2	Direct	Indirect	Sub-Total3		
1	40.8	-190.3	-46.2	-0.1	-195.7	89.9	48.8	138.6	29.3	65.2	94.6	37.5	0.3
2	15.2	-9.6	9.9	-0.6	14.9	26.9	21.6	48.5	-29.2	20.0	-9.2	54.2	3.0
3	809.4	-188.1	-264.9	310.4	666.8	435.5	604.8	1,040.3	1,032.7	588.3	1,621.0	3,328.1	4.6
3-1	350.1	105.1	-80.9	56.3	430.5	209.6	93.4	302.9	168.0	124.7	292.7	1,026.2	3.8
3-2	236.6	-495.6	-194.6	36.7	-416.9	33.8	392.5	426.3	733.0	327.1	1,060.1	1,069.5	3.4
3-3	222.8	202.4	10.6	217.3	653.1	192.1	119.0	311.1	131.7	136.5	268.1	1,232.3	8.7
4	1,024.1	82.4	-2.5	3.4	1,107.4	4.8	3.5	8.3	6.9	3.8	10.7	1,126.4	4.1
5	132.0	151.5	-11.6	13.9	285.8	14.1	32.3	46.4	60.1	30.2	90.3	422.5	6.5
6	887.6	319.5	13.7	31.1	1,251.8	63.6	28.4	92.0	67.1	33.3	100.4	1,444.2	8.1
7	1,466.2	141.4	-59.4	53.8	1,602.0	166.4	63.0	229.5	147.5	73.3	220.8	2,052.3	3.3
8	93.0	9.6	-62.6	218.1	258.1	-2.6	12.5	9.9	65.4	32.7	98.2	366.1	3.4
9	-6.6	-33.4	-67.0	-35.0	-141.8	14.2	12.6	26.8	20.2	13.4	33.6	-81.5	-2.2
Total	4,461.8	283.0	-490.6	595.0	4,849.2	812.9	827.4	1,640.3	1,400.0	860.4	2,260.4	8,749.9	4.0

(% Share)

Industry	Direct Effect within Kyushu					Direct & Indirect Effects from Kanto			Direct & Indirect Effects from the Other Regions			Total
	DD	IO	IS	EE	Sub-Total1	Direct	Indirect	Sub-Total2	Direct	Indirect	Sub-Total3	
1	0.5	-2.2	-0.5	0.0	-2.2	1.0	0.6	1.6	0.3	0.7	1.1	0.4
2	0.2	-0.1	0.1	0.0	0.2	0.3	0.2	0.6	-0.3	0.2	-0.1	0.6
3	9.3	-2.1	-3.0	3.5	7.6	5.0	6.9	11.9	11.8	6.7	18.5	38.0
3-1	4.0	1.2	-0.9	0.6	4.9	2.4	1.1	3.5	1.9	1.4	3.3	11.7
3-2	2.7	-5.7	-2.2	0.4	-4.8	0.4	4.5	4.9	8.4	3.7	12.1	12.2
3-3	2.5	2.3	0.1	2.5	7.5	2.2	1.4	3.6	1.5	1.6	3.1	14.1
4	11.7	0.9	0.0	0.0	12.7	0.1	0.0	0.1	0.1	0.0	0.1	12.9
5	1.5	1.7	-0.1	0.2	3.3	0.2	0.4	0.5	0.7	0.3	1.0	4.8
6	10.1	3.7	0.2	0.4	14.3	0.7	0.3	1.1	0.8	0.4	1.1	16.5
7	16.8	1.6	-0.7	0.6	18.3	1.9	0.7	2.6	1.7	0.8	2.5	23.5
8	1.1	0.1	-0.7	2.5	2.9	0.0	0.1	0.1	0.7	0.4	1.1	4.2
9	-0.1	-0.4	-0.8	-0.4	-1.6	0.2	0.1	0.3	0.2	0.2	0.4	-0.9
Total	51.0	3.2	-5.6	6.8	55.4	9.3	9.5	18.7	16.0	9.8	25.8	100.0

Table 10. Sources of Output Growth: 1980-85

(In Billion Yen)

Industry	Direct Effect within Kyushu					Direct & Indirect Effects from Kanto			Direct & Indirect Effects from the Other Regions			Total	Growth Rate
	DD	IO	IS	EE	Sub-Total1	Direct	Indirect	Sub-Total2	Direct	Indirect	Sub-Total3		
1	109.2	-144.2	100.5	5.4	70.8	5.8	70.4	76.1	2.8	113.4	116.2	263.1	1.8
2	-0.5	-12.3	-42.8	-3.0	-58.6	-31.2	6.9	-24.3	25.4	1.0	26.4	-56.6	-3.1
3	110.1	-931.7	226.0	245.7	-349.8	432.4	556.3	988.7	695.3	472.9	1,168.2	1,807.1	2.1
3-1	224.3	-224.0	106.5	25.1	131.9	20.6	103.0	123.6	274.1	133.0	407.1	662.7	2.1
3-2	-104.9	-728.7	24.9	83.2	-725.5	-39.4	226.4	186.9	14.9	179.8	194.7	-343.8	-1.0
3-3	-9.3	21.0	94.7	137.4	243.8	451.2	226.9	678.1	406.3	160.1	566.4	1,488.3	7.1
4	-955.5	-24.8	1.0	3.1	-976.1	11.7	4.8	16.5	15.0	4.1	19.1	-940.5	-3.2
5	183.6	-42.1	4.2	10.8	156.5	22.8	25.0	47.8	65.3	23.7	89.0	293.3	3.5
6	303.4	-837.1	8.3	57.2	-468.2	256.3	40.5	296.8	440.6	40.9	481.5	310.0	1.3
7	3,065.1	-27.3	41.5	38.9	3,118.1	343.0	75.7	418.7	281.4	64.6	346.0	3,882.8	5.1
8	-136.5	-67.3	-38.9	109.9	-132.8	54.8	56.1	110.8	299.0	35.8	334.8	312.8	2.5
9	44.1	-417.5	-25.5	3.0	-395.9	220.7	30.2	250.9	139.3	17.2	156.5	11.5	0.3
Total	2,722.9	-2,504.2	274.2	471.0	964.0	1,316.2	865.7	2,182.0	1,964.1	773.6	2,737.6	5,883.6	2.3

(% Share)

Industry	Direct Effect within Kyushu					Direct & Indirect Effects from Kanto			Direct & Indirect Effects from the Other Regions			Total
	DD	IO	IS	EE	Sub-Total1	Direct	Indirect	Sub-Total2	Direct	Indirect	Sub-Total3	
1	1.9	-2.5	1.7	0.1	1.2	0.1	1.2	1.3	0.0	1.9	2.0	4.5
2	0.0	-0.2	-0.7	-0.1	-1.0	-0.5	0.1	-0.4	0.4	0.0	0.4	-1.0
3	1.9	-15.8	3.8	4.2	-5.9	7.3	9.5	16.8	11.8	8.0	19.9	30.7
3-1	3.8	-3.8	1.8	0.4	2.2	0.4	1.8	2.1	4.7	2.3	6.9	11.3
3-2	-1.8	-12.4	0.4	1.4	-12.3	-0.7	3.8	3.2	0.3	3.1	3.3	-5.8
3-3	-0.2	0.4	1.6	2.3	4.1	7.7	3.9	11.5	6.9	2.7	9.6	25.3
4	-16.2	-0.4	0.0	0.1	-16.6	0.2	0.1	0.3	0.3	0.1	0.3	-16.0
5	3.1	-0.7	0.1	0.2	2.7	0.4	0.4	0.8	1.1	0.4	1.5	5.0
6	5.2	-14.2	0.1	1.0	-8.0	4.4	0.7	5.0	7.5	0.7	8.2	5.3
7	52.1	-0.5	0.7	0.7	53.0	5.8	1.3	7.1	4.8	1.1	5.9	66.0
8	-2.3	-1.1	-0.7	1.9	-2.3	0.9	1.0	1.9	5.1	0.6	5.7	5.3
9	0.7	-7.1	-0.4	0.1	-6.7	3.8	0.5	4.3	2.4	0.3	2.7	0.2
Total	46.3	-42.6	4.7	8.0	16.4	22.4	14.7	37.1	33.4	13.1	46.5	100.0

Table11. Sources of Output Growth: 1985-90

(In Billion Yen)

Industry	Direct Effect within Kyushu					Direct & Indirect Effects from Kanto			Direct & Indirect Effects from the Other Regions			Total	Growth Rate
	DD	IO	IS	EE	Sub-Total1	Direct	Indirect	Sub-Total2	Direct	Indirect	Sub-Total3		
1	134.8	-438.6	3.4	11.7	-288.6	7.8	49.4	57.2	254.6	65.1	319.7	88.4	0.6
2	25.5	-80.6	59.4	-1.9	2.4	-7.0	15.3	8.3	-56.7	20.9	-35.8	-25.2	-1.5
3	1,908.8	-878.6	-1,127.1	349.2	252.4	691.4	1,040.8	1,732.3	528.5	934.7	1,463.1	3,447.8	3.5
3-1	974.8	-111.1	-358.0	45.7	551.4	199.4	160.4	359.8	356.4	180.3	536.8	1,448.0	4.0
3-2	414.9	-446.3	-315.3	-175.1	-521.8	-28.1	374.4	346.3	-166.0	448.6	282.6	107.0	0.3
3-3	519.1	-321.2	-453.8	478.6	222.8	520.1	506.0	1,026.1	338.1	305.8	643.8	1,892.8	6.5
4	1,619.3	-215.2	-7.0	0.3	1,397.4	6.3	7.7	14.1	8.2	7.6	15.7	1,427.2	4.9
5	399.0	-85.6	-33.8	7.0	286.7	22.1	44.5	66.7	31.1	48.9	80.0	433.3	4.3
6	151.3	10.0	-78.2	9.6	92.7	313.7	85.6	399.3	956.5	113.6	1,070.1	1,562.1	5.8
7	3,298.1	159.1	-195.6	53.7	3,315.3	105.7	149.2	254.9	169.4	129.2	298.6	3,868.7	4.0
8	217.9	-98.2	-68.4	-82.1	-30.8	423.3	109.0	532.3	58.8	99.2	158.0	659.5	4.5
9	57.1	198.8	-31.3	21.7	246.2	-266.1	47.4	-218.7	-143.8	28.6	-115.2	-87.7	-2.7
Total	7,811.9	-1,428.8	-1,478.6	369.1	5,273.7	1,297.2	1,549.1	2,846.3	1,806.4	1,447.8	3,254.2	11,374.1	3.8

(% Share)

Industry	Direct Effect within Kyushu					Direct & Indirect Effects from Kanto			Direct & Indirect Effects from the Other Regions			Total
	DD	IO	IS	EE	Sub-Total1	Direct	Indirect	Sub-Total2	Direct	Indirect	Sub-Total3	
1	1.2	-3.9	0.0	0.1	-2.5	0.1	0.4	0.5	2.2	0.6	2.8	0.8
2	0.2	-0.7	0.5	0.0	0.0	-0.1	0.1	0.1	-0.5	0.2	-0.3	-0.2
3	16.8	-7.7	-9.9	3.1	2.2	6.1	9.2	15.2	4.6	8.2	12.9	30.3
3-1	8.6	-1.0	-3.1	0.4	4.8	1.8	1.4	3.2	3.1	1.6	4.7	12.7
3-2	3.6	-3.9	-2.8	-1.5	-4.6	-0.2	3.3	3.0	-1.5	3.9	2.5	0.9
3-3	4.6	-2.8	-4.0	4.2	2.0	4.6	4.4	9.0	3.0	2.7	5.7	16.6
4	14.2	-1.9	-0.1	0.0	12.3	0.1	0.1	0.1	0.1	0.1	0.1	12.5
5	3.5	-0.8	-0.3	0.1	2.5	0.2	0.4	0.6	0.3	0.4	0.7	3.8
6	1.3	0.1	-0.7	0.1	0.8	2.8	0.8	3.5	8.4	1.0	9.4	13.7
7	29.0	1.4	-1.7	0.5	29.1	0.9	1.3	2.2	1.5	1.1	2.6	34.0
8	1.9	-0.9	-0.6	-0.7	-0.3	3.7	1.0	4.7	0.5	0.9	1.4	5.8
9	0.5	1.7	-0.3	0.2	2.2	-2.3	0.4	-1.9	-1.3	0.3	-1.0	-0.8
Total	68.7	-12.6	-13.0	3.2	46.4	11.4	13.6	25.0	15.9	12.7	28.6	100.0

Table 12. Annual Output Growth (%)

	1965-70	1970-75	1975-80	1980-85	1985-90
Hokkaido	11.4	5.3	3.5	1.7	2.9
Tohoku	11.6	6.5	4.5	3.3	4.4
Kanto	14.6	3.5	4.9	4.8	5.7
Chubu	-	-	5.1	3.9	6.0
Kinki	14.6	2.1	3.1	3.4	5.2
Chugoku	16.9	4.7	3.1	1.8	3.7
Shikoku	14.0	4.6	4.0	2.2	3.0
Kyushu	11.3	5.5	4.0	2.3	3.8
Japan	14.1	4.0	4.3	3.7	5.1

Source: Ministry of International Trade & Industry, *Interregional Input-Output Table 1965, 1970, 1975, 1980, 1985, and 1990*.

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