Chapter 4

THE ECONOMIC IMPACT OF THE EXPO 2025 OSAKA-KANSAI: AN ANALYSIS USING THE 2015 KANSAI INTER-REGIONAL INPUT-OUTPUT TABLE

The purpose of Chapter 4 is to examine the economic effects of the Osaka-Kansai Expo using the tentative 2015 Kansai Inter-regional Input-Output table newly prepared by APIR. In Chapter 6, Section 4 of the "Asia Pacific and Kansai: The Kansai Economic White Paper 2019," we have already presented the prospects for the Osaka-Kansai Expo/MICE/IR and analyzed its economic effects using the 2011 Interregional Input-Output Table for the Kansai Region. New points in this analysis are as follows. First, final demand was reviewed by dividing it into consumption and investment expenditures to reflect the progress of Expo-related projects in Osaka and Kansai. Second, a new concept of the development of the Greater Expo (pavilionization of the Kansai region) was introduced. In addition, the possibility of a virtual Expo is discussed. Third, the input-output table used in the analysis was revised to the 2015 table (provisional version).

The development of this chapter is as follows. Section 1 presents a discussion of the possibility of using the Osaka-Kansai Expo and IR as leverage to turn the Kansai economy around, given that an insufficient investment is the cause of the long-term stagnation of the Kansai economy. Section 2 presents the current status of infrastructure development in anticipation of the Osaka-Kansai Expo and IR, and summarizes the economic effects caused by infrastructure development. Section 3 will discuss the economic effects of the Osaka-Kansai Expo based on the assumption of new final demand, using a new 2015 Kansai Inter-regional Input-Output table. Column 4-A, "Expansion and Co-creation Innovation of Osaka-Kansai Expo," explains the basic concept of the Greater Expo.

Section 1
HOW THE EXPO 2025 OSAKA-KANSAI AND THE OSAKA INTEGRATED RESORT CAN HELP REVITALIZE THE KANSAI ECONOMY

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The aim of this section is to analyze the causes of the subsidence of the Kansai economy over the 50 years since 1970, and to explore the possibility of reversing the stagnant Kansai economy. The author believes that the Kansai economy is ready for a turnaround, and that the possibility of a turnaround by taking advantage of the Osaka-Kansai Expo and IR has increased. Section 1 begins with a chronological account of the stagnant Kansai economy; Section 2 shows that the sinking of the Kansai economy is due to a relative lack of investment; Section 3 discusses the argument that the Osaka-Kansai Expo and subsequent integrated resort (IR)-related investment will be the catalyst for a Kansai economic turnaround; and Section 4 discusses the challenges to realize a Kansai economic turnaround[1].

1. Kansai Economy in Subsidence

(1) Kansai's share of the economy declined rapidly in the 20 years after the Osaka World Exposition

First, let us compare the size of the Kansai economy (the sum of the nominal Gross Regional Products (GRP) of the six prefectures in the Kansai region) with that of the nation as a whole (nominal Gross Domestic Products (GDP)).[2] The share of the Kansai economy is calculated as the share of the national economy over the long term since FY1955.

The share of the Kansai economy peaked at 19.3% in FY1970, the year of the Osaka Expo, and then declined rapidly to 16.2% in 1989 after two oil crises. Due in part to the bubble economy, the share of the Kansai economy once reversed to 17.1% in 1991, but the increase was only temporary. In the late 1990s, the share again declined, falling below 16% in FY2000, and has remained stagnant at

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1) The discussion in this paper is based on Inada (2022).
2) Time series of real and nominal GRP are constructed as follows. In the case of overlapping years, the latest base year was used as the official series. The values of the first year of the available official series are compared with the values of the previous base year counts to create a link coefficient. The link coefficients are multiplied to obtain an extended series of GRP for the most recent base year. For making the long term GDP series, we link the 1980-1994 GDP series at 2015 prices to the 1955-1998 GDP series at 1990 prices. See Reference Table 4-1-1 below for the revision of the prefectural and national accounts.
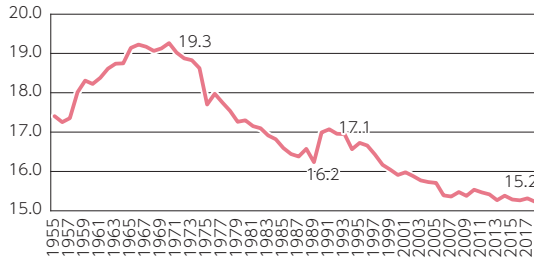
Figure 4-1-1   Share of the Kansai Economy

Source: Prepared by the author based on the System of Prefectural Accounts and the System of National Accounts published by the Cabinet Office

around 15% to date (Figure 4-1-1).

(2) Signs of a turnaround

Since 2015, the Kansai economy has been supported by two types of exports: strong goods exports to China and service exports (including consumption by foreign visitors to Japan), but in 2018, the the economy showed signs of a slump. Behind this was dark news centered on natural disasters, such as the June 18 earthquake in northern Osaka and the closure of Kansai International Airport due to Typhoon No. 21 on September 4, in addition to the worsening trade friction between the U.S. and China.

However, Japan(Osaka) was selected as the host country of the 25th International Exposition at the General Assembly of the BIE on November 23 changed the depressed atmosphere about the future of the Kansai economy. On July 20, the Integrated Resort (IR) Law, which includes casinos, was enacted[3], raising expectations for a possible economic turnaround in the Kansai region through the Osaka-Kansai Expo and IR-related investment. Subsequently, the Japanese and Kansai economies were forced to make major adjustments due to the Corona disaster of 2020-2022, but the possibility of an economic turnaround in the Kansai region has become a reality with the Osaka-Kansai Expo in 2025 just around the corner.

2. Lack of investment is the cause of subsidence

In this section, we first present the determinants of the growth rate and explain

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3) See Part III EXPO 2025 Chronology for a time series of events related to the economy in 2018.

that the cause of the subsidence of the Kansai economy is an insufficient investment.

(1) Determinants of Growth Rate

A continued downtrend in the share of the Kansai economy means that the growth rate of the Kansai economy remains below that of the rest of the economy. This section explores the causes of the decline in the growth rate of the Kansai economy.

Harrod's basic equation for economic growth is expressed as follows. That is, the economic growth rate in period t ($\Delta Y_t / Y_{t-1}$) is explained by the investment rate in period t-1 and the marginal capital coefficient in period t.

$\Delta Y_t / Y_{t-1} = (\Delta K_{t-1} / Y_{t-1}) / (\Delta K_{t-1} / \Delta Y_t)$

=Investment Rate / Marginal Capital Coefficient

Y_t : real GDP in period t, K_t: capital stock at the end of period t, and

$\Delta Y_t = Y_t - Y_{t-1}$, where $\Delta K_t = K_t - K_{t-1} = I_t$ (investment)

This growth equation implies that the higher the ratio of investment that goes to capital accumulation (investment) through savings, the higher the rate of economic growth.

(2) Economic growth rate and investment rate move proportionally

Figure 4-1-2 shows the relationship between the real (GRP) growth rate and the investment rate in the Kansai economy. Here, the investment rate is defined as the ratio of non-residential fixed capital formation (= private-sector business facilities + public-sector business facilities + general government) to GRP. The
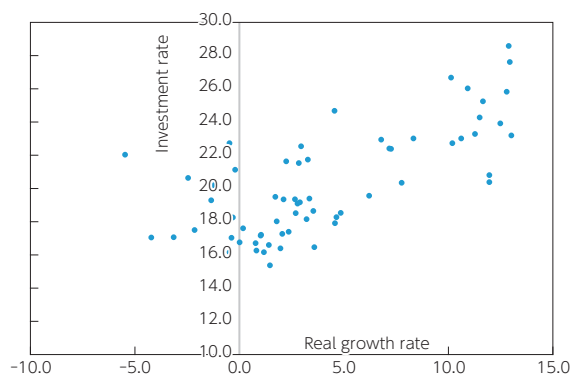

Figure 4-1-2   Real growth rate and investment rate

Source: Prepared by the author based on "Prefectural Accounts," Cabinet Office, Government of Japan

| Table 4-1-1 | Relationship between economic growth rate and nonresidential investment rate |

	Cofficient	t value
Constant term	-6.62314	2.04
SRN(-1)	0.463165	2.74
D74	-9.22254	-3.37
D75	8.392434	3.08
D09	-5.51446	-2.04
Determinant coefficient	0.45	

Note: SRN (-1) is the nonresidential investment ratio in Kansai a year earlier, and D74, D75, and D09 are dummy variables that are set to 1 for 1974, 1975, and 2009, respectively, and 0 for other years.

figure shows that except during periods of major economic shocks (oil crisis and global financial crisis), the growth rate of the Kansai economy is proportional to the investment rate[4] .

Next, Table 4-1-1 shows the regression results of the non-residential investment rate on the economic growth rate of the Kansai economy based on the growth equation. The estimation period is from 1971 to 2018. As shown in the estimation results, in Kansai, a 1 percentage point increase in the investment rate (SRN(-1): non-housing fixed capital formation/nominal GRP) in the previous year would result in a 0.46 percentage point increase in the GRP growth rate (GRPH) in this period[5] . In estimating the growth rate equation, dummy variables are used for the periods of major economic shocks (1974, 1975, and 2009).

Let us explain the meaning of this formula with numerical example: Since the nominal GRP of Kansai in 2018 was 86.13 trillion yen, an additional investment of 1 trillion yen will boost the investment ratio by 1.16 percentage points (1/86.13*100). This means that the economic growth rate of the Kansai region in the next fiscal year will increase by 0.54 percentage points (0.46*1/86.13*100). The relationship between the real (GDP) growth rate and the nonresidential investment rate in the Japanese economy was estimated. The coefficient of the investment rate explaining the Japan's GDP growth rate is 0.479, which is almost the same as that of the Kansai region. This means that the difference in the investment rate explains that in the growth rate well in between Kansai and Japanese economies.

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4) When the marginal capital coefficient is stable, the level of the investment rate almost always determines the growth rate. The marginal capital coefficient was stable up to 1990, but unstable from 1990 to 2010.

5) Here, we use the investment rate not in real terms, but in nominal terms, which shows a more stable relationship with the growth rate.

(3) Sinking of the Kansai economy and insufficient investment

Next, let us compare the investment rate between Kansai and the nation as a whole. First, let's look at the investment rate on a nonresidential basis (Figure 4-1-3). Partly due to the impact of the two oil crises, the investment rates of the Kansai and the Japanese economy showed a downward trend after peaking in the high-growth period (Japan: 26.8% in 1969, Kansai: 25.8%), but bottomed out in the mid-1980s. In the latter half of the 1980s, the investment rate once turned upward due to the bubble economy, but after the burst of the bubble economy, it showed a downward trend again. In 2000, the downward trend bottomed out, followed by a sign of reversal in 2013. See reference Figure 4-1-1 and Figure 4-1-2 below for a breakdown of the nonresidential investment rate by private and public sectors.

Until 1996, the investment rate in Kansai was consistently lower than the national rate. The gap widened from 1 percentage point at the peak to a maximum of 3.6 percentage points. This means that the Kansai region has been consistently underinvested. Since then, the gap between the national and Kansai investment rates has remained below 1 percentage point, and the gap was reversed in FY09-10. This means that the economic growth rate of Kansai was consistently lower than that of the nation as a whole, based on the relationship between the investment rate and the growth rate confirmed above. Table 4-1-2 shows the average difference in investment rates between the nation and Kansai by period: 2.27 percentage points for FY1965-89, 1.72 percentage points for FY1990-92, and 0.33 percentage points for FY1993-18. After the collapse of the bubble economy, the
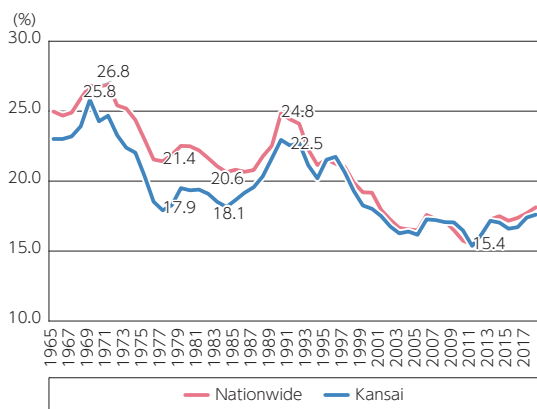

| Figure 4-1-3 | Comparison of investment rates: non-housing |

Source: Prepared by the author based on "Prefectural Accounts," Cabinet Office, Government of Japan

| Table 4-1-2 | Breakdown of the average investment rate gap between Japan and Kansai |

| Period | Non-residential | Breakdown | |
		Private corporate sector	Public sector
1965-1989	2.27	0.54	1.74
	100.0	23.6	76.4
1990-1992	1.72	0.81	0.90
	100.0	47.5	52.5
1993-2018	0.33	-0.35	0.67
	100.0	-107.1	207.1

Note: Units are percentages and percentage points. The upper panel shows the period average of the disparity in investment rates between Japan and the Kansai region. The lower panel shows the contribution.

investment rate gap between Japan and the Kansai region has narrowed significantly, and the growth rate gap between Japan and the Kansai region has also narrowed considerably. In other words, it can be said that the deceleration of growth rates in regions other than Kansai has become relatively conspicuous.

Let us analyze the disparity in the non-housing investment rate by dividing it into the private corporate sector (private corporate facilities) and the public sector (public corporations + general government). In FY1965-FY1989, the gap in non-residential investment (100%) between Kansai and the nation as a whole is mainly due to the public sector (76.4%), other than the private sector (23.6%). This period was characterized by underinvestment in the public sector. Kansai's share of public investment is lower than that of the nation as a whole. In FY90-92, the gap in the non-housing investment rate was about the same for the private sector and the public sector, while in FY93-18, the gap was exclusively caused by the public sector (207.1%). In the private sector (-107.1%), the gap between the nation as a whole and that of the Kansai region has reversed, unlike in the past. In addition to the fact that the gap in the public sector investment rate between the nation as a whole has narrowed over the entire period, and that public works in Kansai in 2021 exceeded the growth of the nation as a whole, there is a strong possibility that the public sector investment rate in Kansai is currently higher than that of the nation as a whole.

3. Osaka-Kansai Expo and IR to Reverse the Kansai Economy

(1) Average growth rates of the Kansai economy and the Japanese economy

As discussed in Section 1, the share of the Kansai economy peaked (19.3%) in the year of the Osaka Expo. In Section 2, it is assumed that the cause of the

sinking of the Kansai economy is the relative underinvestment of the Kansai economy based on the growth equation. Therefore, if the underinvestment can be resolved (i.e., if the investment rate rises), we can expect a turnaround in the Kansai economy.

Before considering the future, let us look back at the past (Table 4-1-3). The average growth rate of the Kansai economy exceeded that of the nation as a whole during the high-growth period, and the share of the Kansai economy increased as shown in Figure 4-1-1 above. In the 1980s and 1990s, both Kansai and national average growth rates declined while Kansai slowed down even faster. The average growth rate for the 2000-2021 period was 0.6% for the nation as a whole, and 0.3% for the Kansai economy, which is almost zero growth[6] .

According to the Cabinet Office, the potential growth rate of the Japanese economy will slow to 0.5% in FY2021[7] . Compared to the case in which the national economy grows at a potential growth rate of 0.5%, two cases were assumed for the growth rate of the Kansai economy, in which the rate accelerates by 0.5 percentage points and 1 percentage point from the assumed national potential growth rate. Behind this assumption is the estimation that an additional investment of about 1 trillion yen would raise the economic growth rate of the Kansai region by about 0.54%, as shown in Section 2 (2). The increase in investment in the Osaka/Kansai Expo and subsequent IR will lead to further growth in the Kansai region, both domestically and internationally.

If further investment can be attracted from within and outside Japan, including increased investment in the Osaka-Kansai Expo and subsequent IR, a turnaround in the Kansai economy will be possible. The following section presents the results of a simulation of a Kansai economic turnaround based on an

Table 4-1-3	Comparison of real growth rates (annual average): Kansai vs. Nationwide

	Nationwide	Kansai region
1956-1969	9.8	10.6
1971-1979	5.0	5.7
1980-1989	3.8	3.7
1990-1999	1.6	1.0
2000-2021	0.6	0.3

Note: Unit: %.
Source: Prepared by the author based on the Cabinet Office's "Prefectural Accounts" and "National Accounts."

6) The Kansai economy is based on actual results through FY2018 and APIR forecasts for FY2019-2021.
7) The latest GDP gap and potential growth rates are available from the Cabinet Office. (https://www5.cao.go.jp/keizai3/getsurei/2211gap.xls)

acceleration of the growth rate in Kansai.

(2) Simulation of Kansai Economic Reversal

In creating the baseline, we set the benchmark (FY2021) nominal GDP of Japan at 541.6 trillion yen and the nominal GRP of the Kansai region at 84.2 trillion yen. The nominal GDP for Japan is actual through FY2021, but the nominal GRP for the Kansai region is available only through FY18, so the advanced estimates presented in Chapter 2, Section 2 were used.

For FY2022 and beyond, we assume that the Japanese economy will grow at a potential growth rate of 0.5%. Real GDP and nominal GDP are assumed to grow at the same rate. Compared to these baselines, Case 1 assumes that the Kansai region grows at a rate 0.5 percentage points faster than the nation as a whole (1%), and the shares of Kansai and the nation as a whole were calculated. According to this assumption, the share of the Kansai economy will increase to 16.2% in FY2030 and 17.1% in FY40. As a result, the Kansai economy will recover its share from the early 1980s (Figure 4-1-4).

Next, we calculated the share of the Kansai economy and the nation as a whole assuming Case 2 (additional investment of approximately 2 trillion yen/year), in which the growth rate of the Kansai region (1.5%) exceeds that of the nation by 1.0 percentage point relative to Case 1 (additional investment of approximately 1 trillion yen/year). In this case, the share of the Kansai economy would increase to 17.0% in FY2030 and to 18.7% in FY40, which means that the Kansai economy would recover its share in 1973 (Figure 4-1-5).
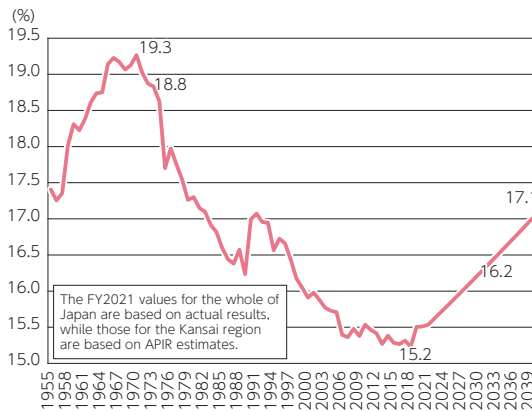

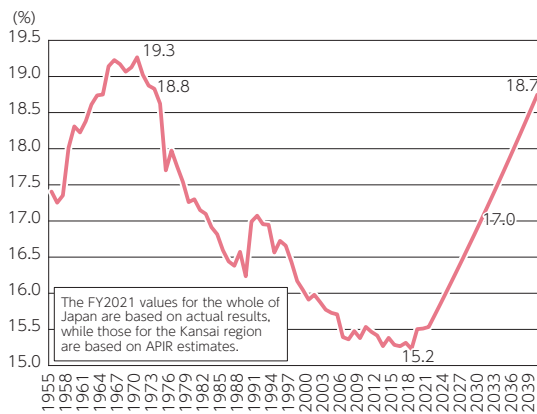**Figure 4-1-4** Scenario for Kansai Economic Reversal: Case of 0.5 percentage point growth acceleration in Kansai

Part I

Part II

Part III

Part IV

(%)

19.3
18.8
18.7
17.0
15.2

The FY2021 values for the whole of Japan are based on actual results, while those for the Kansai region are based on APIR estimates.

1955 1958 1961 1964 1967 1970 1973 1976 1979 1982 1985 1988 1991 1994 2000 2003 2006 2009 2012 2015 2018 2021 2024 2027 2030 2033 2036 2039

Figure 4-1-5   Scenario of Kansai Economic Reversal: Case of 1.0 percentage point growth acceleration in Kansai

4. Implications of the analysis

In this section, we have identified a lack of investment relative to the nation as the cause of the Kansai economy's 50-year slump. In addition to the underinvestment in the private sector, we found that in the public sector it was particularly large.

Based on the relationship between the growth rate and the investment rate, an additional investment of about 1 trillion yen would raise the growth rate of the Kansai region by about 0.54 percentage points. In addition, simulations showing that the Kansai economy will grow 0.5 percentage points faster than the Japanese economy (potential growth rate) indicate that the share of the Kansai economy in FY2030 could increase from a current 15.2% (FY18) to 16.2%, and to 17.1% in FY40.

The investment for the Osaka-Kansai Expo in 2025 and the accompanying transportation infrastructure development, as well as the IR-related investment expected to follow, is well in excess of JPY 1 trillion. The simulations presented in this paper show the impact of increased investment based on a reasonable basis.

The issue is the sustainability of the large increase in investment triggered by the case such as, the Osaka-Kansai Expo and IR. The key to guaranteeing this is how to attract investment from both inside and outside the country. Another important point is how to attract "profitable industries" and how to envision a shift to "profitable industries". Now that the infrastructure of the Kansai economy is in place and the conditions for a turnaround have been created, it is

important that the world recognize the attractiveness of Kansai as a legacy of the Osaka-Kansai Expo, resulting in a virtuous cycle of human resources and funds.

References
Inada, Yoshihisa (2022) "Toward a Reversal of the Kansai Economy: Leveraging the Osaka-Kansai Expo and IR Expo, using IR as leverage", APIR Trend Watch No. 81. (https://www.apir.or.jp/research/11106/, last checked on July 5, 2022)

Reference Chart

**Reference Table 4-1-1**   Revision status of Prefectural Accounts and National Accounts

System of Prefectural Accounts

Period	1955-1974	1975-1999	1990-2003	1996-2009	2001-2014	2006-2018	2011-2019
Compliant SNA	1968SNA	1968SNA	1993SNA	1993SNA	1993SNA	2008SNA	2008SNA
Base year	1980 base	1990 base	1995 base	2000 base	2005 base	2011 base	2015 base
Substan-tiation method	Fixed base year method	Fixed base year method	Fixed base year method	Fixed base year method	Fixed base year method	Chain method	Chain method
Period of formal series		1975-1989	1990-95	1996-2000	2001-2005	2006-2018	
Period of reference series	1955-1974						

System of National Accounts

Period	1955-1998	1980-2003	1980-2009	1994-2012	1994-2020	1994-
Compliant SNA	1968SNA	1993SNA	1993SNA	1993SNA	2008SNA	2008SNA
Base year	1990 base	1995 base	2000 base	2005 base	2011 base	2015 base
Substan-tiation method	Fixed base year method	Fixed base year method	Chain method	Chain method	Chain method	Chain method
Period of formal series						1980-1994
Period of reference series	1955-1998					

Source: Prepared by the author based on "Prefectural Accounts" and "National Accounts" by the Cabinet Office
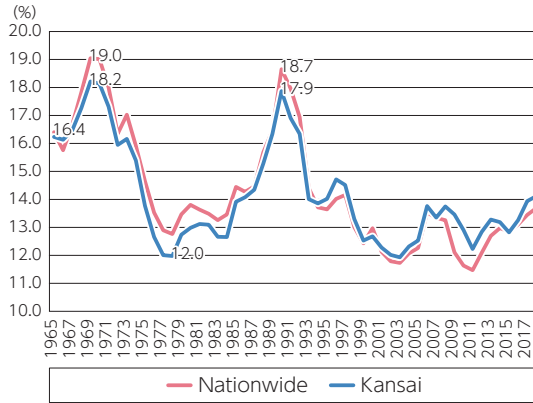
Reference Figure 4-1-1   Comparison of Investment Rates: Private Sector

Source: Compiled by the author based on "Prefectural Accounts" and "National Accounts," Cabinet Office, Government of Japan
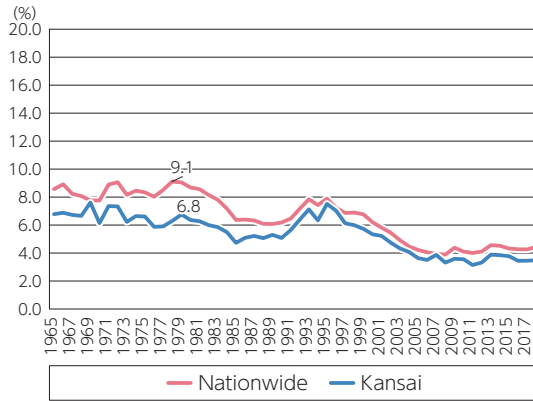
Reference Figure 4-1-2   Comparison of investment rates: Public sector

Source: Prepared by the author based on "Prefectural Accounts" and "National Accounts," Cabinet Office, Government of Japan