



## Section 1 Revitalization of Regional Economies through ICT

### 1. Growth of regional economies through ICT

#### (1) Economic growth of Japan and development of regional economy

As the population ages and the birthrate declines, Japan is expected to become a super-aging society with a declining population. If the population ages and declines at the current rate, the working population engaged in production activities will decline in the mid- to long-term, having a negative impact on the economic growth of the country. In order to maintain economic growth under these circumstances, it will be necessary to utilize diverse ideas from the public and to create new added values. In particular, the development of a regional economy will be of great importance for the future economic growth of Japan.

However, the environment surrounding the regional economy has changed rapidly recent years. The regional economy is faced with various issues; for example, the globalization of economic activities along with the spread of ICT, subsequent competition in an international market, and transition from a growth model of a high-growth era based on public projects, and so on. Local society is locked into a vicious circle, becoming less attractive due to the loss of its traditional crafts and authentic local culture, which induces further population decline. When it becomes difficult to secure the labor force due to the population decline, it is feared companies may flow out of the region, with a resultant decline in tax revenues and deterioration of local government finances. Furthermore, the deterioration of local government finances may lead to the degradation of administrative services, which will escalate the population outflow further, triggering a negative chain reaction.

In order to recover from the negative chain reaction, it is necessary for each local area to activate its own production activities and to achieve its own economic growth under a declining population.

#### (2) Characteristics of ICT capital and current situation of ubiquitous networks

##### A. Economic efficiency of networks through ICT capital

ICT is increasingly taking the role of a new infrastructure for production activities and the importance of ICT capital has dramatically increased. When local

communities aspire to attain economic growth whatever the circumstances, it is essential to input and utilize ICT capital actively as an opportunity to bring about change in production activities.

In particular, ICT capital, such as computers, has a characteristic whereby the “economic efficiency of networks” takes effect. As ubiquitous networks progress, information and knowledge exchanges are activated through networks of ICT capital, which will enable us to create various innovations and new added values. In other words, it is fair to conclude that the accumulation of ICT capital and progress of ubiquitous networks improve the productivity of the overall economy through the effect of the economic efficiency of networks, and at the same time, contribute to the economic growth of Japan by providing sources for new added values.

##### B. Developing ubiquitous index for each prefecture

For an analysis of the impact of the progress of ubiquitous networks on regional economic growth, we have developed the “Ubiquitous Index” for each prefecture as an index to indicate the progress of ubiquitous networks (See **Figure 1-1**). From changes to the ubiquitous index it has been found that the index figures are getting larger on a whole and the rate of increase has rapidly accelerated since 2000. When ubiquitous indexes are compared by prefecture, while the figure for Tokyo grew by 7.6 from 2000 to 2005, the figure for Aomori remained as low as a growth of 4.7, showing the dispersion among different prefectures.

#### (3) Progress of ubiquitous networks and regional economic growth

The following is the analysis of the impact of ICT capital and the progress of ubiquitous networks on the economic growth of each prefecture, using a macro production function model. Here, the effect of the progress of ubiquitous networks on economic growth is examined by using a ubiquitous index developed for this study.

##### A. Estimate equation

The following is the production function model used for this analysis<sup>1</sup>. In order to better understand the difference between prefectures, the model is assigned with prefecture-specific dummy variables.

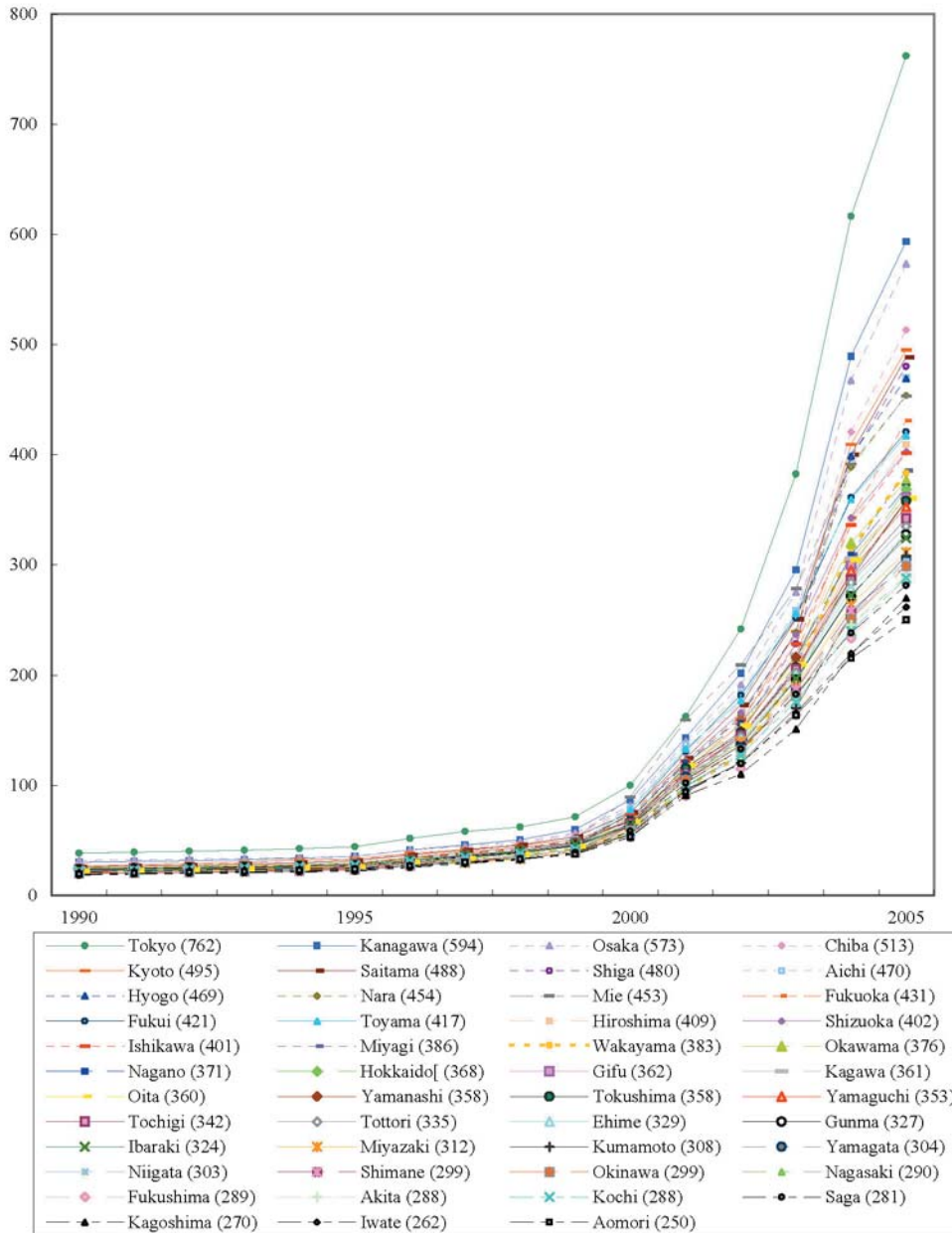
$$\ln(Y/L) = \ln A + \alpha' \ln(K_{all}/L) + \left( \sum_{p=1}^{47} \beta_p dp_p \right) \cdot \ln(K_i \cdot U)$$

Labor input,  $U$ : Ubiquitous index,  $dp_p$ : Prefecture-specific dummy variables

$Y$ : Output,  $K_{all}$ : Total Capital,  $K_i$ : ICT Capital,  $L$ :

**Fig. 1-1 Trends in Ubiquitous Index of each prefecture**

(The value in Tokyo in 2000 is defined as 100.)



\* Figures in brackets indicate the values of the ubiquitous index of each prefecture as of 2005.  
 (Source) "Survey on Regional Economic Growth Brought about by the Development of a Ubiquitous Network"

<sup>1</sup> Since the effect of ICT capital on economic growth varies depending on the progress in ubiquitous networks, we have estimated the degree of the contribution of ICT capital stock, obtained by multiplying ICT capital by the ubiquitous index which indicates the progress of the ubiquitous network.  
<sup>2</sup> The 2007 White Paper, Information and Communications in Japan, confirmed that economic efficiency of networks becomes effective for ICT capital while the returns are kept constant with regard to the size of corporate production activities, which

causes the generation of increasing returns for the whole economy. It also confirmed that in addition to the economic efficiency of a network of ICT capital, the effect of the usage aspect of ubiquitous networks, such as "expansion of spread" and "increased use", causes the generation of increasing returns for the whole economy, while keeping the returns constant with regard to the size of corporate production activities, etc.

B. Effect of progress of ubiquitous networks on economic growth

According to the result of the estimation, the variables obtained by multiplying ICT capital by the ubiquitous index are significantly positive in all prefectures, proving that the effect in terms of economic efficiency and the use of ubiquitous networks through ICT capital make a positive contribution to the improvement of labor productivity<sup>2</sup> (Figure 1-2).

This indicates that local economies with low growth have the potential to grow dramatically, if the ubiquitous networks make progress and the economic efficiency of networks takes effect in all sectors, cre-

ating new innovations and added values.

C. Contribution of the progress of ubiquitous networks to the growth of real prefectural product

Based on the estimates analyzed in the previous section the contribution of the progress of ubiquitous networks of ICT capital to the economic growth of each prefecture is examined. The result shows that the contribution ratio in terms of economic efficiency and use of networks through ICT capital to the average growth rate of real gross prefectural product from 2001 to 2005 lies in between 0.35% and 1.71%, with the contribution rate exceeding 50% in 35 prefectures,

Fig. 1-2 Estimates of a model using prefectural panel data

Capital share	Parameter	Coefficient	t-value
Hokkaido	$\beta 1$	0.020	12.300
Aomori	$\beta 2$	0.013	6.980
Iwate	$\beta 3$	0.013	7.930
Miyagi	$\beta 4$	0.018	10.350
Akita	$\beta 5$	0.014	7.030
Yamagata	$\beta 6$	0.013	7.410
Fukushima	$\beta 7$	0.017	9.180
Ibaraki	$\beta 8$	0.021	12.170
Tochigi	$\beta 9$	0.019	10.970
Gunma	$\beta 10$	0.017	9.630
Saitama	$\beta 11$	0.024	15.420
Chiba	$\beta 12$	0.024	14.140
Tokyo	$\beta 13$	0.028	16.840
Kanagawa	$\beta 14$	0.023	13.190
Niigata	$\beta 15$	0.018	10.040
Toyama	$\beta 16$	0.016	7.450

	Parameter	Coefficient	t-value
Ishikawa	$\beta 17$	0.019	11.150
Fukui	$\beta 18$	0.016	7.310
Yamanashi	$\beta 19$	0.018	9.450
Nagano	$\beta 20$	0.016	9.020
Gifu	$\beta 21$	0.018	9.220
Shizuoka	$\beta 22$	0.021	11.900
Aichi	$\beta 23$	0.019	10.390
Mie	$\beta 24$	0.023	11.500
Shiga	$\beta 25$	0.027	15.130
Kyoto	$\beta 26$	0.023	13.030
Osaka	$\beta 27$	0.020	11.220
Hyogo	$\beta 28$	0.019	9.340
Nara	$\beta 29$	0.026	14.060
Wakayama	$\beta 30$	0.013	6.100
Tottori	$\beta 31$	0.018	10.570
Shimane	$\beta 32$	0.015	8.680
Okayama	$\beta 33$	0.016	7.610

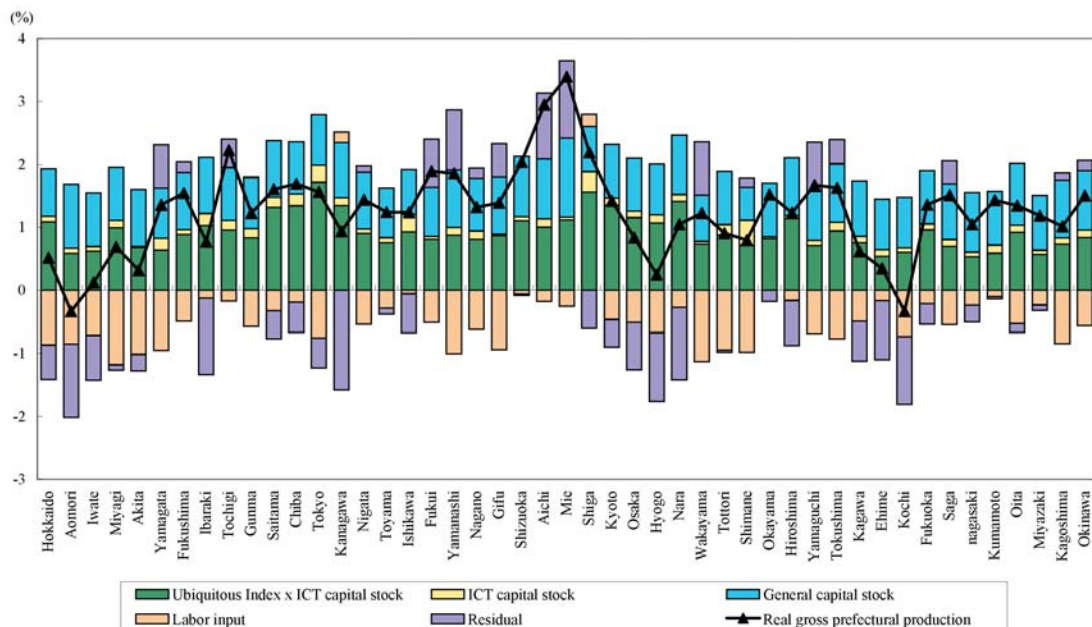
	Parameter	Coefficient	t-value
Hiroshima	$\beta 34$	0.021	11.170
Yamaguchi	$\beta 35$	0.014	6.690
Tokushima	$\beta 36$	0.020	10.920
Kagawa	$\beta 37$	0.016	8.160
Ehime	$\beta 38$	0.011	6.220
Kochi	$\beta 39$	0.013	7.040
Fukuoka	$\beta 40$	0.017	9.570
Saga	$\beta 41$	0.015	8.360
Nagasaki	$\beta 42$	0.011	6.040
Kumamoto	$\beta 43$	0.011	6.420
Oita	$\beta 44$	0.018	9.290
Miyazaki	$\beta 45$	0.012	6.480
Kagoshima	$\beta 46$	0.015	8.760
Okinawa	$\beta 47$	0.018	11.050
Constant term	lnA	1.613	28.000

Sample	376
Log likelihood	1054.76

(Source) "Survey on Regional Economic Growth Brought about by the Development of a Ubiquitous Network"

Fig. 1-3 Decomposition of the average growth rate of real gross prefectural product (2001-2005)



(Source) "Survey on Regional Economic Growth Brought about by the Development of a Ubiquitous Network"

which suggests that the effect of economic efficiency and use of networks through ICT capital is significant in underpinning economic growth (Figure 1-3).

#### D. Outlook of regional economic growth

The growth rate of real gross prefectural product for 2011 was projected based on the estimates of the previous sections B and C to find out how much the effect of economic efficiency and use of networks through ICT capital contributes to economic growth<sup>3</sup>, and the result shows that the contribution rate of economic efficiency and use of networks through ICT capital to the growth rate of real gross prefectural product lies in between 0.90% to 2.53%, exhibiting an increase from the contribution ratio obtained in section C (the average real growth rate of real gross prefectural product from 2001 to 2005). This suggests the possibility of attaining further economic growth in all prefectures if ICT capital is accumulated and a ubiquitous society makes progress smoothly. (Figure 1-4).

#### (4) Impact of capital allocation among regions on the overall economy

Under the assumptions of (3)-D, it has been suggested that the smooth accumulation of ICT capital and progress of ubiquitous networks could possibly further drive up economic growth in 2011. From this result, it is conceivable that measures for the further improvement of the contribution of ICT capital and

ubiquitous networks could enhance the growth of the overall economy.

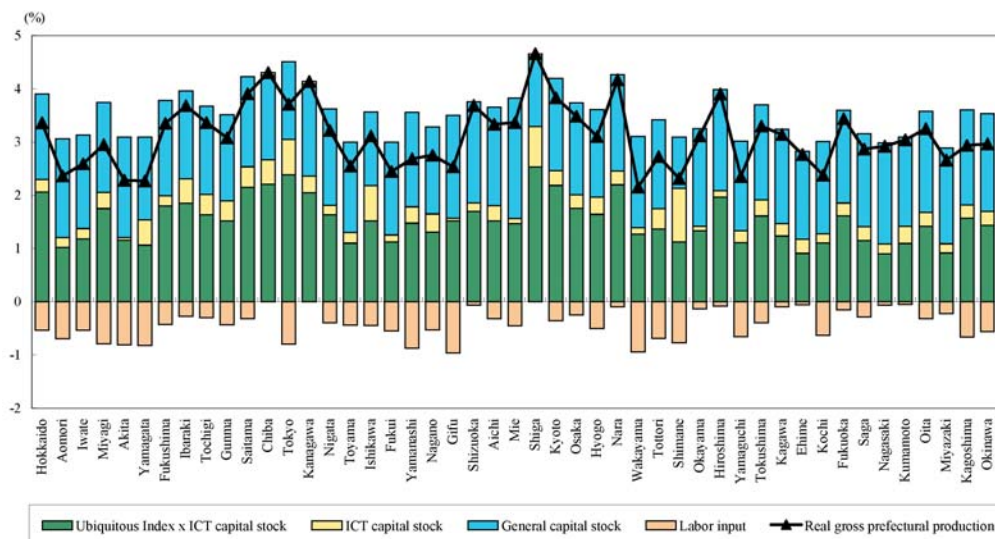
A possible measure for improving the contribution of ICT capital and ubiquitous networks is to promote the accumulation of ICT capital, the basis for a ubiquitous network. We have created a scenario where accumulated ICT capital facilitates the progress of ubiquitous networks and promotes economic growth, and conducted a simulation of economic growth in accordance with this scenario.

With regard to an accumulation of ICT capital, it is assumed that 1% of accumulated ICT capital in a given year increases every year, on top of the increment in ICT capital in the years between 2008 and 2011 used in the forecast in (3)-D in the previous section. Using the difference in the allocation method of the 1% growth in ICT capital, we have analyzed the impact on the growth of the overall economy (Figure 1-5).

#### A. Simulation

The ICT capital-labor-ratio (ICT capital stock per employed worker) is taken into consideration when setting up a method for allocating the increment of ICT capital. In the case where, in addition, a fixed amount of ICT capital is increased, the limited effect seems to be larger if such ICT capital is added when ICT capital stock per employed worker is small. However, this effect has not been taken into account in

Fig. 1-4 Decomposition of the growth rate of real gross prefectural product (2011)



(Source) "Survey on Regional Economic Growth Brought about by the Development of a Ubiquitous Network"

<sup>3</sup> The future outlook of individual data was estimated under the following assumptions: labor hours and number of employees are extrapolated with the average growth rate from 2000 to 2006, and general capital stock, ICT capital stock and facility

operation ratio are extrapolated with the average growth rate from 2002 through 2005. The ubiquitous index was calculated with the extension of an estimate of the penetration curve for each piece of data.

the allocation method that simply focuses on the size of ICT capital stock. Thus, when we set up an allocation method, we focused on the ICT capital-labor-ratio, rather than the ICT capital itself.

Figure 1-6 shows a comparison between ICT capital-labor-ratios in 2005 by prefecture. Analyses made below show the impact of the different allocation methods on the real GDP of the overall economy in the cases when the growth of ICT capital was allocated to (1) the top 10, (2) top 20, (3) all 47, (4) bottom 20 and (5) bottom 10 prefectures, respectively, with a focus on ICT capital-labor-ratio.

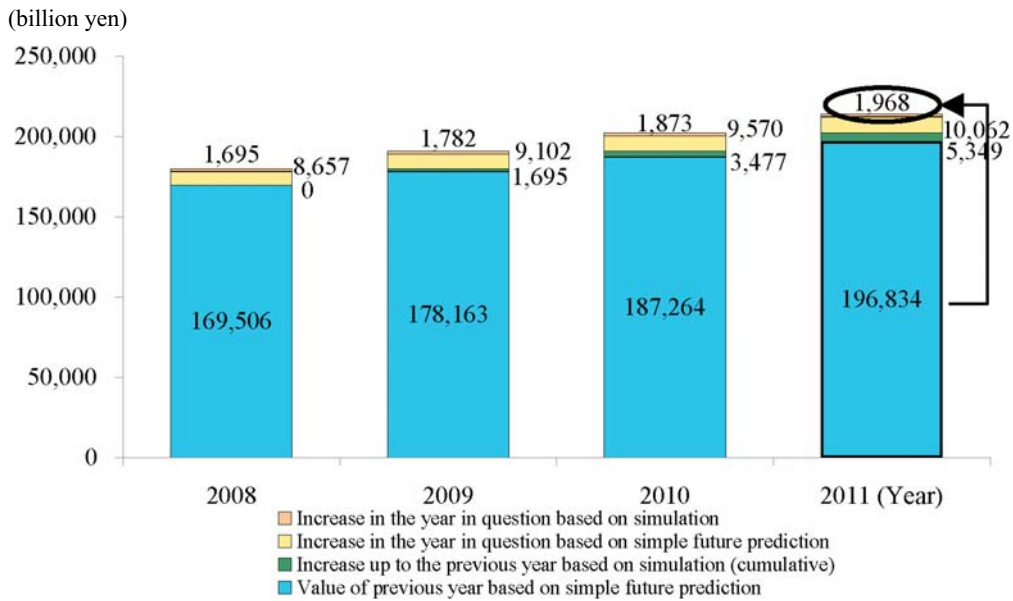
B. Simulation result

Under the scenario where increased ICT capital is

allocated in the five patterns mentioned above, we compared each case with real GDP in Japan in 2011 projected from the future outlook of the growth rate of real gross prefectural product obtained in (3)-D. When observing how much Japan's real GDP increases, it is estimated that the GDP growth is largest in the case where the increased capital is allocated to the bottom 10 prefectures of the ICT capital-labor-ratio, and is smallest in the case where the increased capital is allocated to the top 10 prefectures of the ICT capital-labor-ratio, with a difference in real GDP of one trillion yen between the two cases (Figure 1-7).

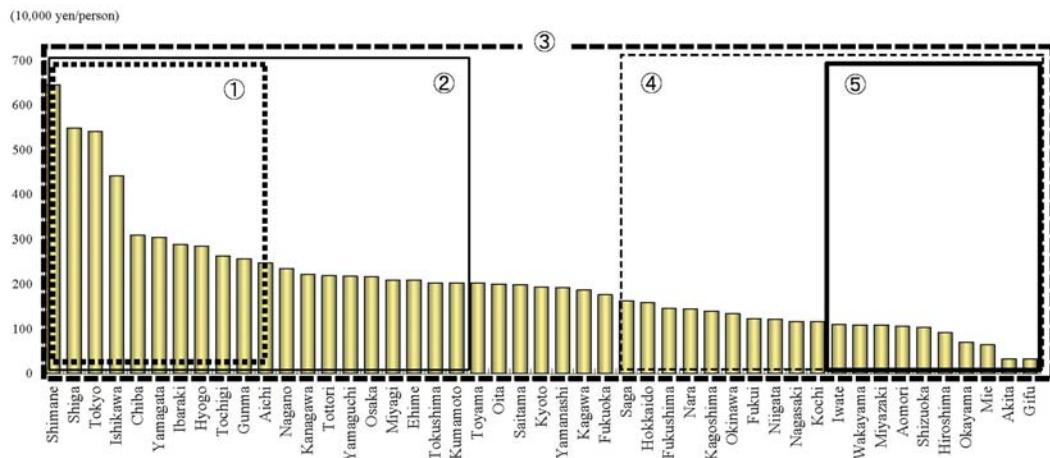
From the comparison of the results of five simulated cases, it has been found that the effect of an increase in real gross prefectural product is larger if

Fig. 1-5 Accumulation of ICT capital assumed in a simulation



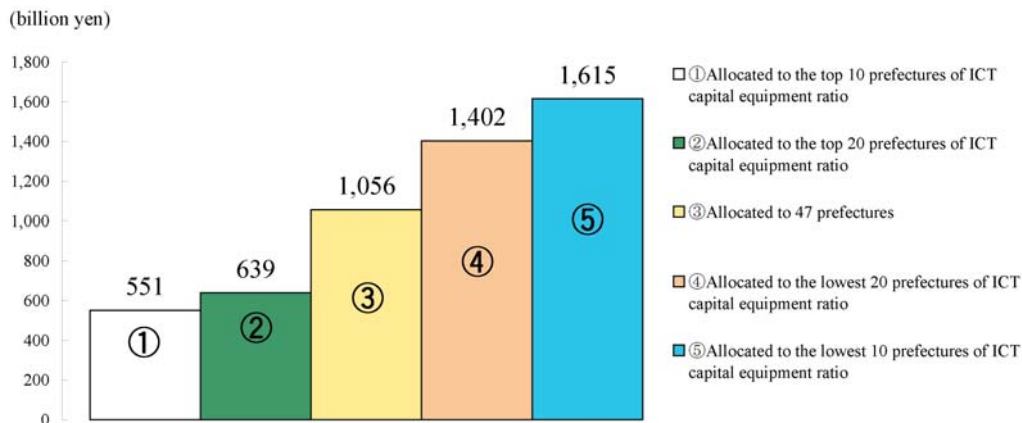
(Source) "Survey on Regional Economic Growth Brought about by the Development of a Ubiquitous Network"

Fig. 1-6 ICT capital-labor-ratio in 2005



(Source) "Survey on Regional Economic Growth Brought about by the Development of a Ubiquitous Network"

Fig. 1-7 Increments from Japan's real GDP forecast values of 2011



(Source) "Survey on Regional Economic Growth Brought about by the Development of a Ubiquitous Network"

the allocation of ICT capital is concentrated in the prefectures with low ICT capital-labor-ratios.

Many prefectures with low ICT capital-labor-ratios have either small ICT capital stock or the number of employees is large. Assuming the volume of allocated ICT capital is constant, the smaller the ICT stock is, the larger the growth rate of ICT capital. Prefectures with a large number of employees tend to have a large real gross prefectural product. Thus, the effect of concentrated allocation seems stronger, being influenced by a small ICT capital stock in the case of the former and being influenced by a large real gross prefectural product in the case of the latter.

The result of this simulation suggests that the correction of regional information discrepancies through the deepening of capital in prefectures with low ICT capital-labor-ratios (increase in the capital equipment ratio) will lead to an effective boost of the real GDP of the overall economy.

## 2. Diminution of digital divide between regions

### (1) Use of ICT in households and regional divide

The use of ICT in households at the end of 2007 is examined to find out about the regional divide in 11 regional groups in the country. For example, the

broadband usage rate is highest in the Hokuriku region at 73.4% and lowest in the Tohoku region at 32.8%, with a remarkable difference of 40.6 points (Figure 1-8). IP phone usage rate is highest in the Kinki region at 29.2% and lowest in the Chugoku region at 11.3%, with a difference of 17.9 points.

When taking a look at the installation and usage of ICT devices in households by region at two time points (end of 2007 and 2004) and the regional gap shown therein, it is observed that the diffusion rate increased for almost all items while the regional gap narrowed (Figure 1-9). However, while the diffusion rates for IP phones and broadband increased from three years earlier, the coefficient of variances is virtually unchanged, exhibiting a persistent regional gap. In households, although there is almost no regional gap in the possession of ICT devices, such as mobile phones and PCs, and in the fundamental aspects of ICT usage, such as use of the Internet, the coefficient of variances has not narrowed for the use of broadband and IP phones, indicting a persistent regional gap. Therefore, it is necessary to eliminate the regional digital divide further, focusing on usage aspects in households.

### (2) Use of ICT in corporations and regional divide

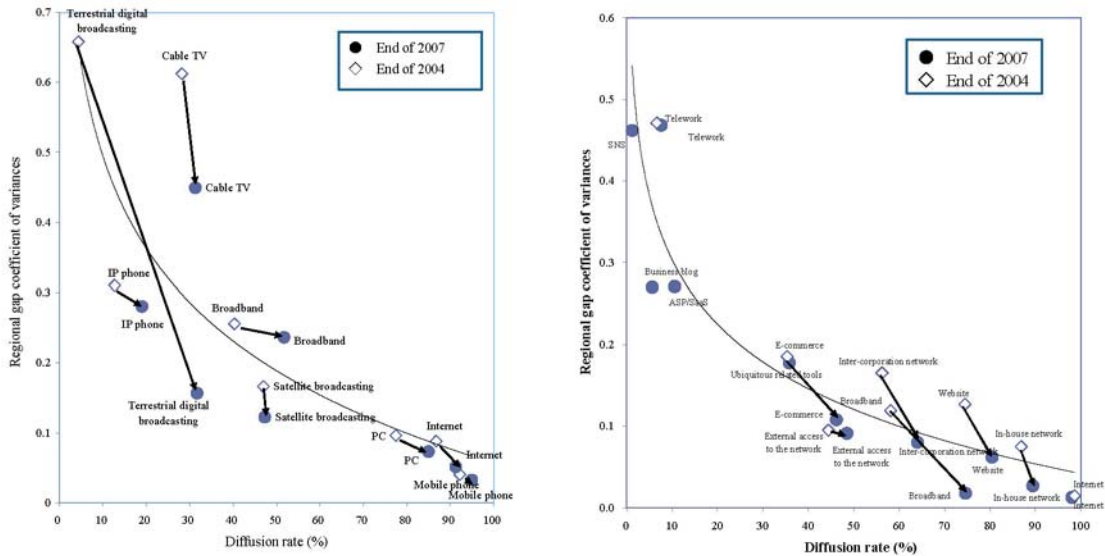
When taking a look at the installation and usage of

Fig. 1-8 Usage of ICT in households by region

	Mobile phone ownership rate	PC ownership rate	Internet usage rate	Broadband usage rate	IP phone usage rate	Terrestrial digital broadcasting audience rating	Cable TV audience rating	Satellite broadcasting audience rating
Highest region	Hokuriku 99.4%	Hokuriku 94.1%	Hokuriku 96.0%	Hokuriku 73.4%	Kinki 29.2%	Minami Kanto 38.0%	Hokuriku 62.7%	Hokuriku 59.2%
Lowest region	Shikoku 89.8%	Shikoku 72.8%	Shikoku 81.6%	Tohoku 32.8%	Chugoku 11.3%	Shikoku 20.5%	Tohoku 11.2%	Hokkaido 39.6%
Difference (points)	9.6	21.3	14.4	40.6	17.9	17.5	51.5	19.6

(Source) "Communication Usage Trend Survey (2007)," MIC

**Fig. 1-9 Usage of ICT in households/corporations and regional gap thereof (left: households, right: corporations)**



\* For Business blog, SNS, ASP/SaaS, Ubiquitous related tools, there is no data in the end of 2004.

(Source) "Communication Usage Trend Survey," MIC

ICT devices in corporations by region at two time points (end of 2007 and 2004) and the regional gap thereof, it is observed that the diffusion rate increased for almost all items while the regional gap narrowed, indicating that use of ICT by corporations has a relatively small regional gap (Figure 1-9). However, there are regional gaps in such services as ASP/SaaS, telemarketing, business blogging, SNS, etc., and their diffusion is not progressing much.

### 3. Regional revitalization through ICT use

#### (A) Use of ICT in regions

##### A. Significance of regional revitalization through use of ICT

It is believed that today's regions lack the best human resources or corporations with unique skills that attract companies outside the region as well as the necessary information and capital to attract such human resources. However, on the other hand, each region is fully endowed with the potential resources to achieve economic growth, and it is essential to tap and utilize such regional resources using unique ideas and creative approaches to facilitate regional development

in the future. ICT is expected to play a crucial role as a tool to make use of such regional strengths and to overcome any weaknesses. It is thought that ICT would contribute primarily to the enhancement of the information transmission capacity of the region through correction of the information gap, secondly to the improvement of labor productivity of corporations and thirdly to the improvement of peoples' welfare and the reconstruction of local communities.

Below, we have analyzed the use of ICT systems and their subsequent effects, and the methods for operations, etc. of municipalities, based on the results of the nation-wide questionnaire surveys on municipalities.

##### B. Formulation of ICT use index for each municipality

When ICT use is analyzed, the administrative fields of municipal governments were categorized into eight groups: namely, 1) crime and disaster prevention, 2) welfare/healthcare, 3) medical care, 4) education and culture, 5) industry and agriculture, 6) transportation and tourism, 7) administrative services and 8) community. The function of ICT systems in each field were then divided into seven sub-groups (six for the transportation and tourism field), and we have con-

<sup>4</sup> Examples of ICT systems in each area are as follows: ① crime/disaster prevention (high-altitude disaster monitoring camera, local protection system, etc.) ② welfare/healthcare (monitoring system for the elderly living alone, home health check system, etc.) ③ medical care (wide-area medical chart network, remote medical services, etc.) ④ education/culture (remote classroom system, e-learning system, etc.) ⑤ industry/agriculture (online sales for specialties, information pro-

vision system to attract outside corporations), ⑥ transportation/tourism (tourism information system, information provision system for location of buses, etc.), ⑦ administrative services (public facility reservation system, e-application system for administrative procedures, etc.), ⑧ community (local SNS/Ae-conference system between administration and residents, etc.)

ducted questionnaire surveys on a total of 55 items<sup>4</sup>, to find out what kind of function each system developed by municipal governments has. Furthermore, from the viewpoint of recently installed systems not yet being fully functioning, the introduction periods were rated with points, assigning introduction prior to 2006 with 10 points, introduction after 2007 with 8 points and no introduction with zero points, then the function was multiplied by the introduction timing to obtain the scores. Then, we created the “ICT Field-specific Use Index” that would indicate the use of ICT in eight fields in individual municipalities and the “ICT Comprehensive Use Index” that integrates with fields as an indicator of the overall use of ICT.

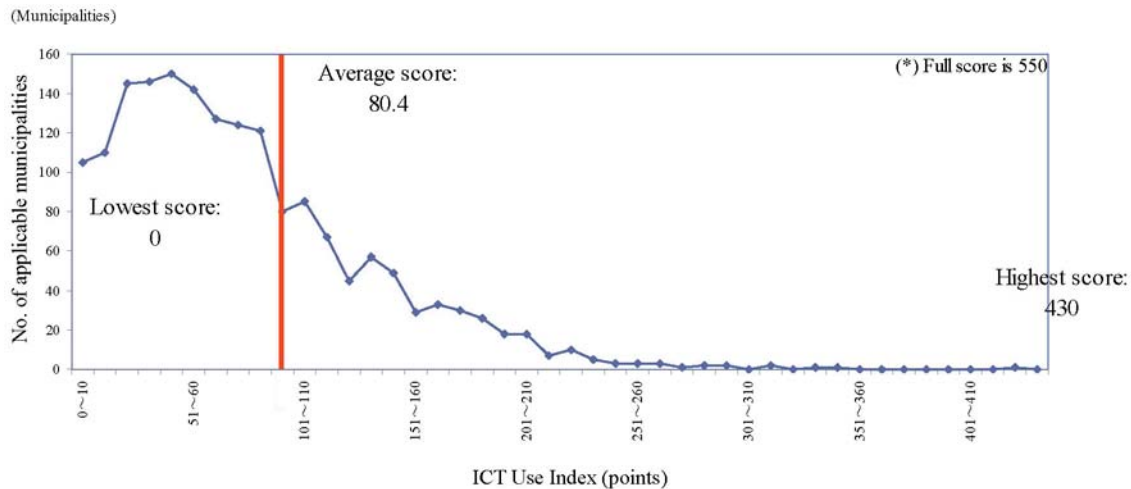
C. ICT use by municipalities

(a) Comprehensive use of ICT

(i) Overall view of ICT use

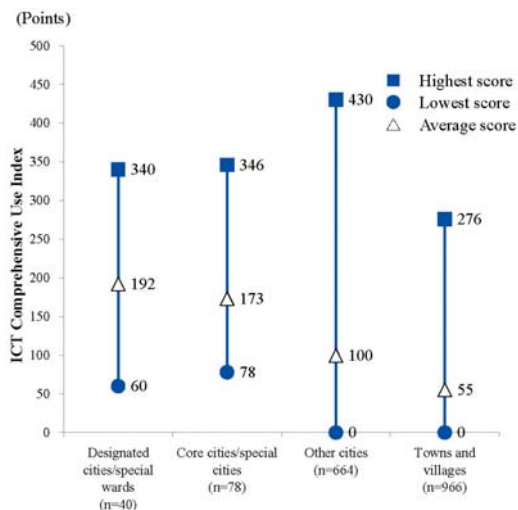
When viewing the ICT use of the 1,748 municipalities in the country using the ICT Comprehensive Use Index, the best score attained was 430 out of the full score of 550, the lowest score was zero, and the average score was 80.4. The result shows that while there are municipalities taking highly innovative approaches, many other municipalities are still not able to fully utilize ICT (Figure 1-10).

Fig. 1-10 Distribution of ICT Comprehensive Use Index



(Source) “Investigative Study on Regional Informatization Approaches and Regional Revitalization”

Fig. 1-11 Distribution of ICT Comprehensive Use Index by city categorization



(Source) “Investigative Study on Regional Informatization Approaches and Regional Revitalization”

Fig. 1-12 Municipalities with high ICT Comprehensive Use Index

Rank	Municipality	Score
1	Fujisawa City, Kanagawa Pref.	430
2	Hirakata City, Osaka Pref.	346
3	Osaka City, Osaka Pref.	340
4	Hiroshima City, Hiroshima Pref.	318
5	Nishinomiya City, Hyogo Pref.	316
6	Nagoya City, Aichi Pref.	300
7	Miyoshi City, Hiroshima Pref.	292
8	Sukagawa City, Fukushima Pref.	284
8	Kyoto City, Kyoto Pref.	284
10	Naganuma Town, Hokkaido Pref.	276

\* Shaded cities are cities or towns other than designated cities, core cities or special cities.

(Source) “Investigative Study on Regional Informatization Approaches and Regional Revitalization”



(ii) ICT use by municipality

Viewing the use of ICT by city categories reveals that the average score is highest in ordinance-designated cities and special districts, followed by core cities/exception cities, and then other cities and towns and villages, indicating that the larger the size of the municipality, the higher the average score (Figure 1-11). However, focusing on the highest score, the highest score of the designated cities/special districts is lower than that of other cities. Cities and towns other than designated cities are ranked high in the ICT Comprehensive Use Index, indicating that municipalities taking pioneering approaches are not necessarily limited to large-size municipalities (Figure 1-12).

(b) Field-specific ICT use in eight major fields

When viewing ICT use according to the attributes of municipalities, ICT use is relatively advanced in municipalities with elderly populations of 30% or more (hereinafter referred to as “aged municipalities”) and municipalities located in disadvantaged areas (such as depopulated areas) in the fields such as welfare/healthcare, medical care, industry/agriculture, transportation/tourism and community (Figure 1-13). For these municipalities, responding to aging and

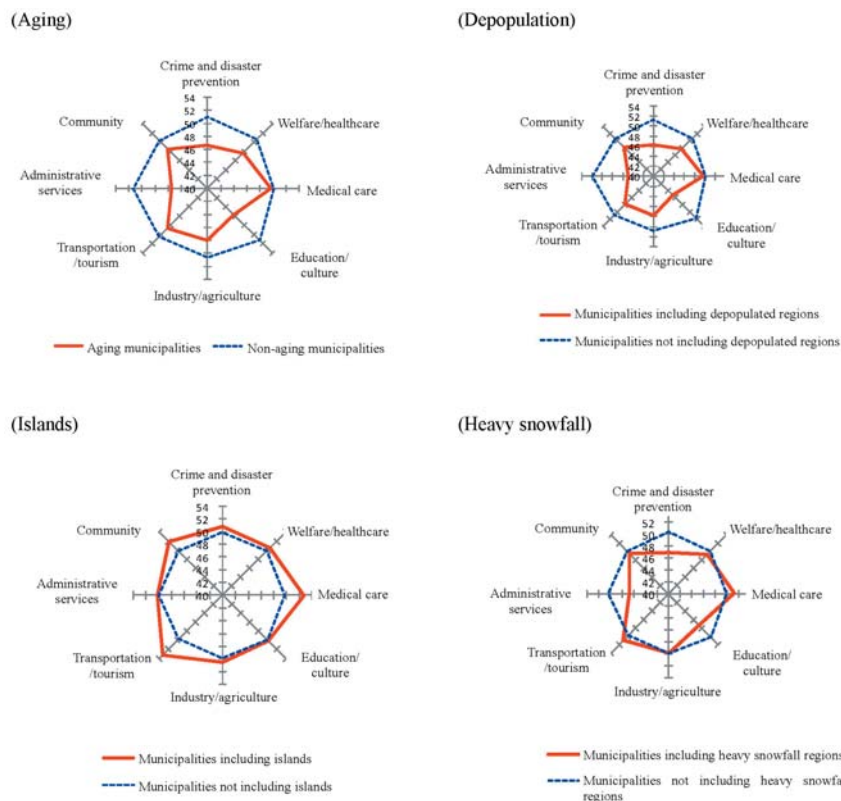
depopulation, etc. is the priority issue that administrations are faced with. It is therefore assumed that more weight is being placed on the fields for which ICT use is thought to be effective in terms of the reduction of social and welfare expenditures, cultivation of local industries, and utilization of tourism resources, etc., namely, welfare/healthcare, industry/agriculture, and transportation/tourism. In municipalities including islands, ICT is utilized more in all fields compared to municipalities that do not include islands.

(2) Key factors of ICT use

A. Development of promotional system, formulation of informatization plan and ICT-related budget percentage

A total of 2,748 municipalities are classified into four categories depending on the progress of promotional systems (condition as to whether a department in charge of ICT has been established and a Chief Information Officer (CIO) has been appointed) to examine the use of ICT according to ICT-related budget percentage. When municipalities implementing both the preparation of a promotional system and the formulation of an ICT plan are compared with muni-

Fig. 1-13 ICT Use Index by fields, viewed by the attribute of municipalities



\*ICT Field-specific Use Index of municipalities are converted to deviation scores, and the average values of each attribute group are illustrated graphically.

(Source) “Investigative Study on Regional Informatization Approaches and Regional Revitalization”

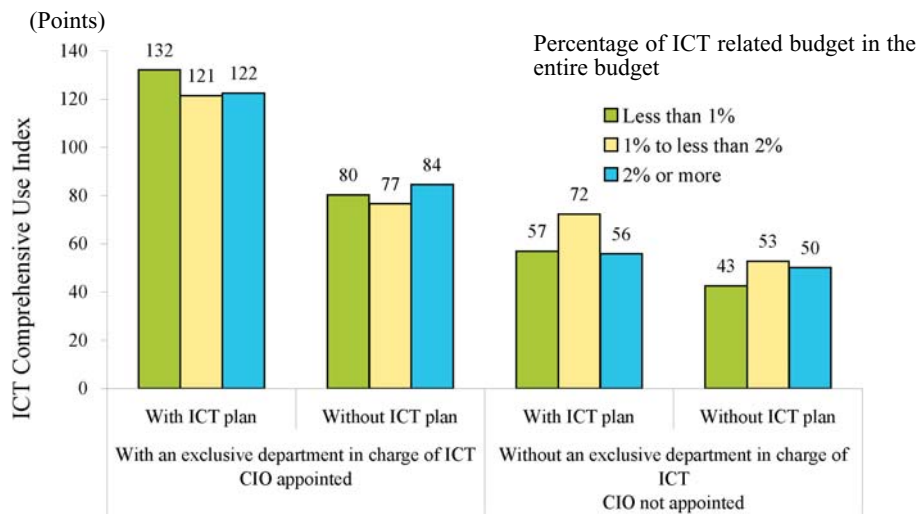
papalities implementing neither of them, the average score of the ICT Use Index differs greatly, with the former scoring more than double the latter (Figure 1-14). It shows that there is a possibility that the formulation of an ICT plan results in the effective use of ICT, in addition to the establishment of departments in charge of ICT and the appointment of a CIO.

B. Population size, wide-range cooperation and ICT-related budget percentage

A total of 1,748 municipalities in Japan are classi-

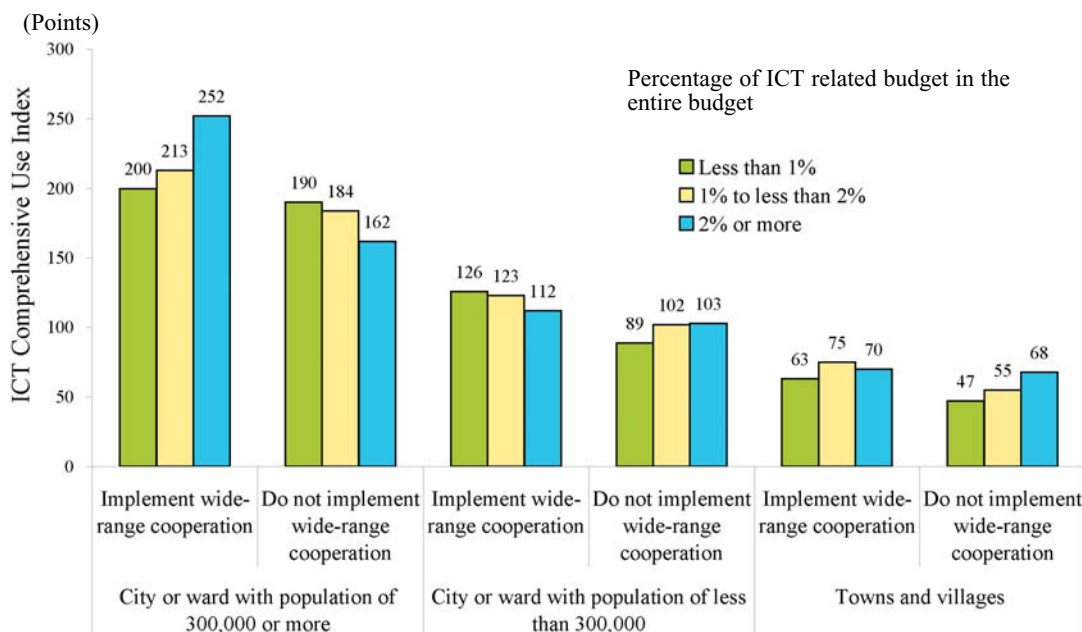
fied according to size of population and ICT-related budget percentage, and we have examined their use of ICT as to whether they implement wide-range cooperation with neighboring municipalities in developing applications. It can then be observed that municipalities implementing wide-range cooperation make advanced use of ICT, more than those not implementing such cooperation, regardless of population size (Figure 1-15). From this, it is fair to conclude that the joint development of systems involving several municipalities is the key factor in promoting the use of

Fig. 1-14 ICT Comprehensive Use Index (by promotional system, ICT plan, and ICT related budget percentage)



(Source) "Investigative Study on Regional Informatization Approaches and Regional Revitalization"

Fig. 1-15 ICT Comprehensive Use Index (by population size, wide-range cooperation, and ICT related budget percentage)



(Source) "Investigative Study on Regional Informatization Approaches and Regional Revitalization"

ICT.

C. Effect of supportive measures by the government

A total of 2,748 municipalities are classified into four categories depending on the progress of promotional systems (conditional on whether a department in charge of ICT has been established and a CIO appointed) to examine the use of ICT according to the ICT-related budget percentage. It is found from this analysis that the average score of the ICT Comprehensive Use Index of municipalities that have established promotional systems is about twice as high as that of municipalities that have not established such

systems, even if both groups use supportive measures from the government (Figure 1-16).

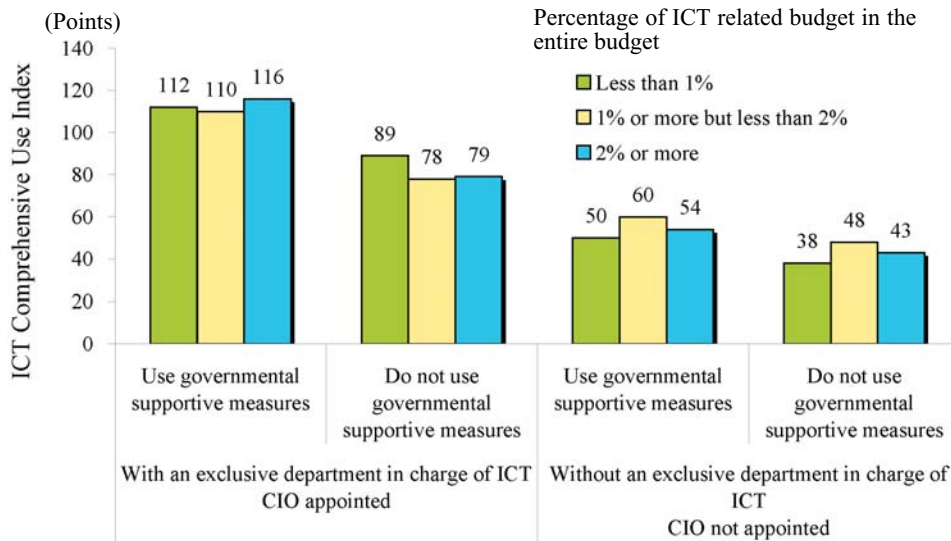
Therefore, it can be said that the simple acceptance of supportive measures does not always facilitate ICT use, but the key to the effective promotion of ICT is that municipalities should contrive ways to take full advantage of supportive measures.

(3) Evaluation and analysis of use of ICT

A. Subjective evaluation of municipalities on use of ICT

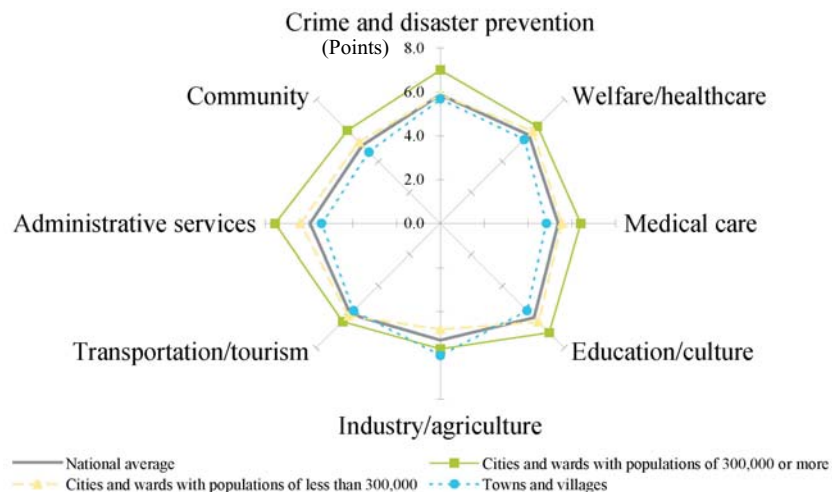
We asked municipalities using ICT if the use of

Fig. 1-16 ICT Comprehensive Use Index (by promotional system, use of governmental supportive measures, and ICT related budget percentage)



(Source) "Investigative Study on Regional Informatization Approaches and Regional Revitalization"

Fig. 1-17 Effect of ICT use in each field by population size



(Source) "Investigative Study on Regional Informatization Approaches and Regional Revitalization"

ICT was effective in terms of the following five items in each field: (i) improvement of the efficiency of administrative cost reduction, (ii) expansion of areas covered by administrative services, (iii) improvement of accuracy of information provided to residents, (iv) acceleration of speed such as the expedited response to the needs of residents, and (v) increased volume of information provided to residents.

The response “fully effective” was given two points and “quite effective” one point, and other responses a zero point, and the average score for the questions from (i) to (v) in each field is used to show the evaluation of effect of ICT utilization by population size in municipalities. The result shows that the average score is highest and the effect is most noticeably felt in the administrative services field among both cities and wards with populations of more 3000,000 and less than 300,000. And the average score of towns and villages is highest in the industry/agriculture field (Figure 1-17). In contrast,

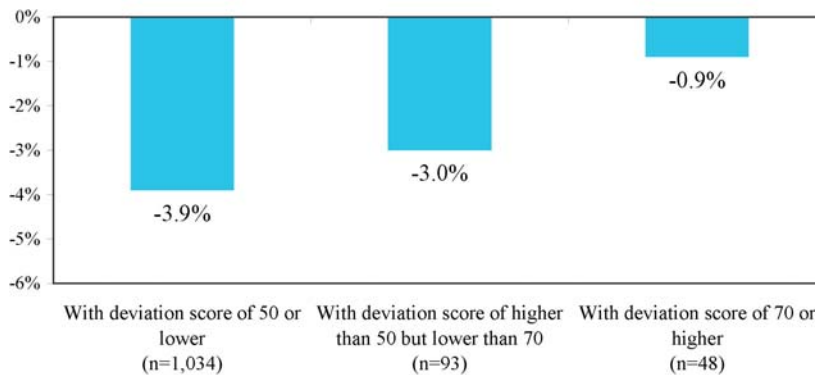
the average scores are low and the effect of ICT is not felt in the fields of medical care and community. This is because the effect is not exercised just by introducing an ICT system and that it will require separate care in terms of human resources development in these fields, such as the improvement of user skills and knowledge, etc.

B. Relation between ICT use and regional revitalization

(a) Industry/agriculture field

A total of 1,175 municipalities throughout the county are classified into three groups in accordance with the level of ICT utilization in the field of industry/agriculture and the change in income from agricultural production per farming household from 2000 to 2005 is examined. The result shows that while municipalities with low deviation scores of less than 50, or those with low ICT utilization, have the largest

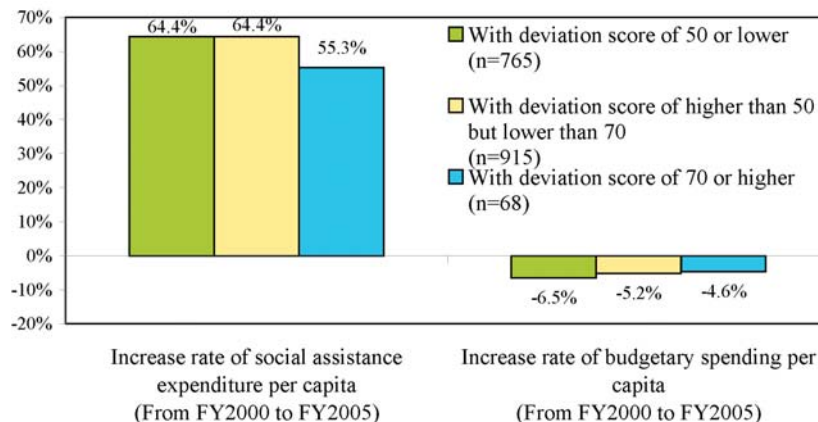
Fig. 1-18 Increase rate of production agricultural earnings per farming household by ICT use



\* The data of the increase rate of production agricultural earnings per farming household are based on the Statistics on Earnings related to Agricultural Production by MAFF.

(Source)” Investigative Study on Regional Informatization Approaches and Regional Revitalization”

Fig. 1-19 Increase rate of social assistance expenditure and budgetary spending per capita by ICT use



\* The data of the increase rate of social assistance expenditure per capita and the increase rate of budgetary spending per capita are based on the Study on the Settlement of Accounts by Municipalities by MIC.

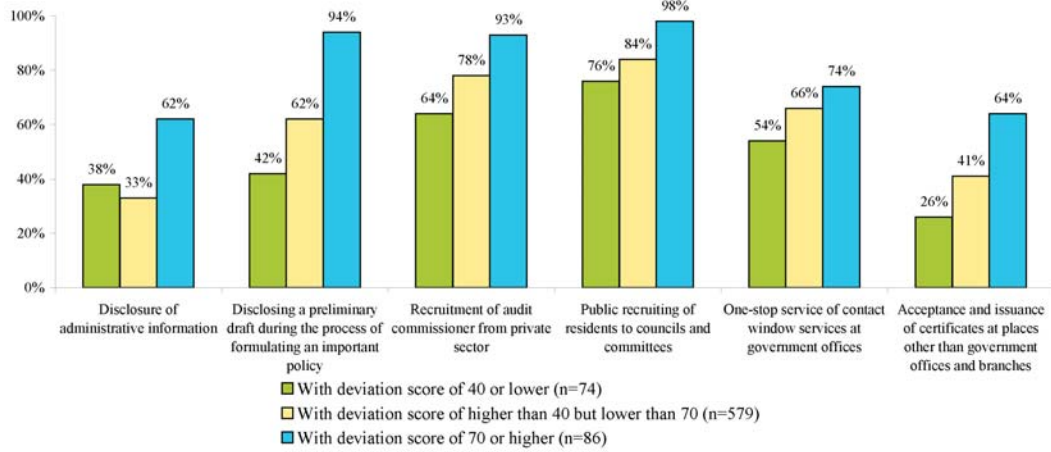
(Source)” Investigative Study on Regional Informatization Approaches and Regional Revitalization”

reduction rate at 3.9%, municipalities with high deviation scores of more than 70, or those with high ICT utilization, have the smallest reduction rate at 0.9%, exhibiting a difference between these groups of 3.0

points. From this, it is found that there is a clear correlation between the level of ICT utilization and the change in income from agricultural production.

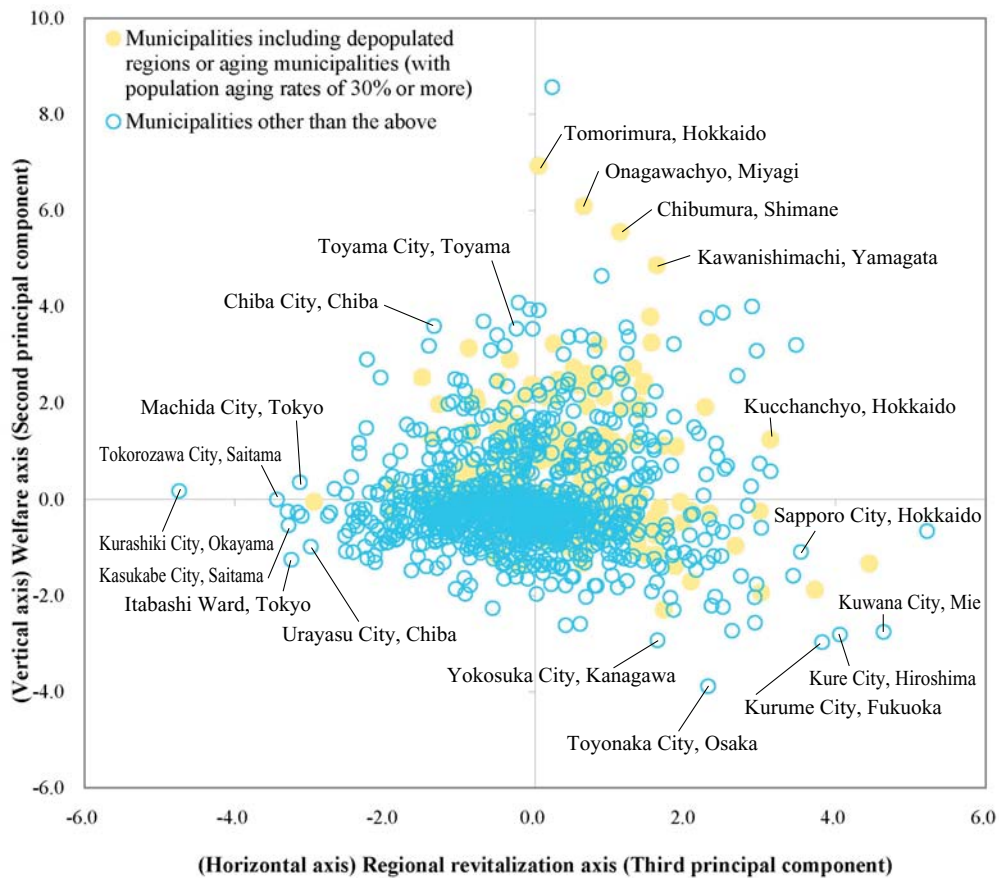
The background to this may lie in the impact of

**Fig. 1-20 Implementation of administrative services by ICT use**



\* The data of the state of implementation of administrative services, etc. are based on the Data of the Fifth Comparison Survey on the Administration of Municipalities throughout Japan, 2006 by the Nikkei Institute of Industry and Regional Economy (Source) "Investigative Study on Regional Informatization Approaches and Regional Revitalization"

**Fig. 1-21 Categorization of municipalities**



(Source) "Investigative Study on Regional Informatization Approaches and Regional Revitalization"

ICT utilization, such as the introduction of a sales system via the Internet, on the income from agricultural products. With this system, for instance, local products and specialties that have previously only been consumed locally can now be sold to consumers in remote areas, enlarging the market throughout the country by the introduction of an Internet-based sale system. In reality, more than 50% of municipalities with high ICT utilization have introduced net sales systems, whereas those with low ICT utilization have not introduced such systems.

(b) Welfare/healthcare field

A total of 1,748 municipalities in the country are classified into three groups in accordance with the level of ICT utilization in the field of welfare/healthcare, and the change in social assistance expenditure from FY2000 to FY2005 is examined. The result shows that while municipalities with a high deviation score of more than 70, or those with high ICT utilization, have an increased rate of 55.3%, municipalities with a low deviation score of less than 50, or those with low ICT utilization, have an increased rate of 64.4%, exhibiting a difference between these groups of 9.1 points. From this, it is found that there is a clear correlation between the level of ICT utilization and a restraining effect of an increase in social assistance expenditure.

(c) Administrative services

A total of 739 cities and wards in the country are classified into three groups in accordance with the level of ICT utilization in the field of administrative services, and the efforts of cities and wards in administrative services are examined. The implementation rate of such efforts as disclosure of administrative information, promotion of participation by residents in administration and improving the efficiency of administrative affairs is high among municipalities with advanced ICT use. For example, with respect to the

state of disclosing a preliminary plan during the process of formulating an important policy or the state of accepting and issuing various certificates at places other than the main or branch offices, the score of municipalities with high ICT utilization with a deviation score of 70 or more is twice the score of municipalities with low ICT utilization with a deviation score of 40 or less (**Figure 1-20**). This suggests that municipalities with a high awareness of the disclosure of administrative information, promotion of community participation in administration and facilitation of efficiency of administrative procedures are making active use of ICT in the field of administrative services.

C. Classification of municipalities in terms of ICT use

Using a principal component analysis, one of the multivariate analysis methods, a new index is created from a field-specific ICT use index in municipalities to show the structure of the relationships among ICT systems, such as the strength of such relationships. A graphic classification of municipalities based on the index is shown in **Figure 1-21**. Municipalities positioned on the upper side of the vertical axis (welfare axis) are characteristic of intensive use of ICT in the fields of welfare/healthcare and medical care, while those positioned on the right side of vertical axis (regional revitalization axis) are utilizing ICT intensively in fields such as industry/agriculture and transportation/tourism.

When the attributes of the municipalities positioned on the first quadrant which have high scores on both axes are examined, 43.0% of them have an increasing aging population profile, including depopulation areas. These municipalities have high administrative demands for regional vitalization and response to aging population, such as the development of local industry and utilization of tourism resources, and therefore, they are assumed to be using ICT specializing in these fields.