

Chapter 2

Changing Global Economy and Japan's ICT

Chapter 1 examined the “Channels Linking ICT with Growth.” In order to implement effective ICT policies for growth, the current situation must be fully assessed and issues analyzed, after which the channels affected by such problems need to be strengthened. Chapter 2 assesses the current ICT situation in Japan. Section 1 analyzes the impact of the recent global recession and section 2 evaluates Japan's ICT through an international comparison in terms of infrastructure, utilization and safety.



Section 1 Japan's ICT Industry Facing problems

The global-scale economic downturn since 2008, which is said to be a once-in-a-century occurrence, is having a considerable negative impact on the ICT industry in Japan. However, this is a short-term factor (drastic decline in global demand) and could be seen as an opportunity for reform so as to overcome the medium- and long-term problems facing Japan's ICT.

This section first assesses the impact of the global recession on Japan's ICT industry, then analyzes the medium- and long-term problems, and finally focuses on the dynamic effect of ICT on future growth that can be seen in developments in the markets and corporations.

1. Problems facing Japan's ICT industry

Using estimates taken from the information and communications statistics database that is annually prepared by the Ministry of Internal Affairs and Communications, this section examines the medium- and long-term challenges, including the gap between the real and nominal growth of the ICT industry¹⁵, price reductions mainly of ICT equipment, intensifying global competition with emerging economies, and improvements in the competitiveness of information services.

(1) ICT industry with a difference between real and nominal growth

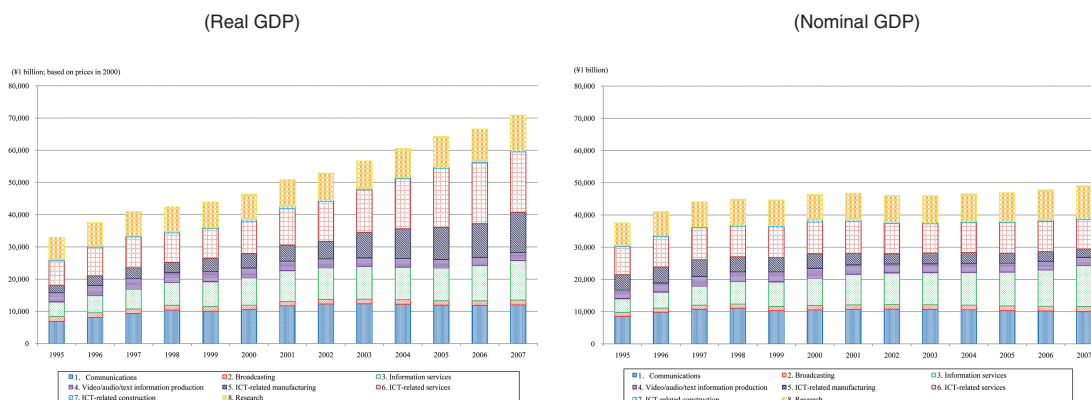
A comparison between the real (2000 price, hereinafter the same shall apply) and nominal GDP of the

ICT industry shows a huge gap between them. Figure 2-1 compares the changes in the real and nominal GDP of the ICT industry. While the real GDP grew consistently at an annual growth rate of 6.6% between 1995 and 2007, the annual growth rate of nominal GDP since 1995 has remained at 2.3%. As in the case of the change in nominal production, it increased between 1995 and 2000, remained unchanged between 2001 and 2004, and has been increasing since 2005.

If we look at a breakdown of the ICT industry, we can see that there is a huge gap between the change in real and nominal GDP of ICT-related manufacturing and ICT-related services. While the real GDP annual average growth rate of ICT-related manufacturing registers a 15.9% increase, the nominal GDP growth rate registers a 4.9% decline, and that of ICT-related services shows a 7.7% and a 0.3% increase, respectively.

In addition to domestic output and GDP, let us also

Figure 2-1 Change in real and nominal GDP of the ICT industry

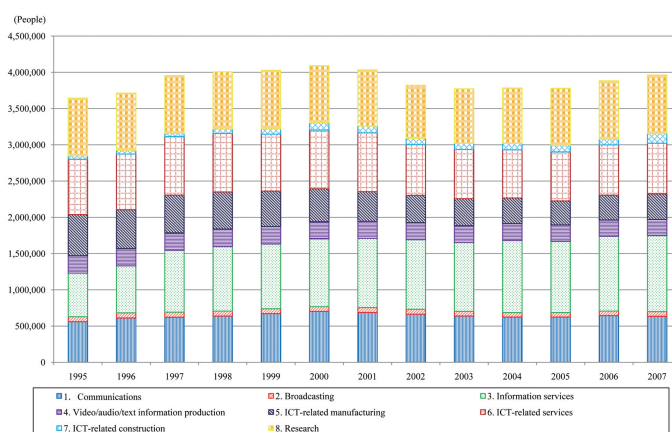


((Source) Survey on Economic Analysis of ICT (2009), Ministry of Internal Affairs and Communications (2009))

¹⁵ Information and communications statistics database defines the ICT industry as an industry that conducts information and communications operations as its economic activity, such as production, collection, processing, accumulation, provision and transmission of information, and data are collected as a sum of

eight sectors: namely, communications, broadcasting, information services, video/audio/text information production, ICT-related manufacturing, ICT-related services, ICT-related construction, and research.

Figure 2-2 Change in the number of employees in the ICT industry



(Source) Survey on Economic Analysis of ICT (2009), Ministry of Internal Affairs and Communications

look at the change in the number of employees in the ICT industry (figure 2-2). The number continued to rise between 1995 and 1999, declined between 2000 and 2003, and began to increase once again after 2003, reaching about 3.96 million employees in 2007.

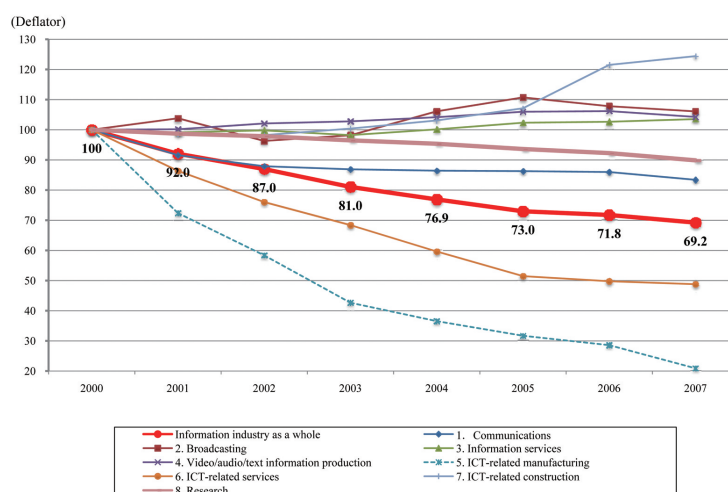
As we have seen thus far, while the real GDP of the ICT industry has substantially grown through price reduction, the growth of nominal GDP has been slow and the increase in the number of employees also has been small. From a medium- and long-term perspective, Japan's ICT industry is expected to follow a development process that will underpin Japan's economy by constantly providing ICT services--the common infrastructure of all industries--at low prices

and that will achieve growth of nominal GDP and an increase in employment, while innovation broadens the industry base, thus creating a series of new businesses.

(2) Further price reduction of ICT-related hardware

Figure 2-3 shows changes in the GDP deflator for the ICT industry as a whole and the detailed deflators by industry. First, the deflator of the ICT industry as a whole has constantly been declining at an annual average rate of 5.1%. The breakdown by industry shows that the decline in ICT-related manufacturing (annual average decline of 20.0%) and in ICT-related

Figure 2-3 Changes in the GDP deflators for the ICT industry



Compiled from Survey on Economic Analysis of ICT (2009), Ministry of Internal Affairs and Communications

services (annual average decline of 9.7%), including the production and lease of digital goods, is particularly notable.

A phenomenon called “commoditization” is often mentioned with regard to the price decline in digital goods. Commoditization is the process by which a product becomes so widespread that it can no longer be differentiated (in terms of function, quality, design, brand, etc.) from other competitive products and the only competitive element that remains is price, typically resulting in decreasing prices. For example, it is the process by which your pioneering company is initially able to gain profits by introducing a product that can only be produced with your company’s special technology. Then, with the dissemination of production technology, modulization of goods and

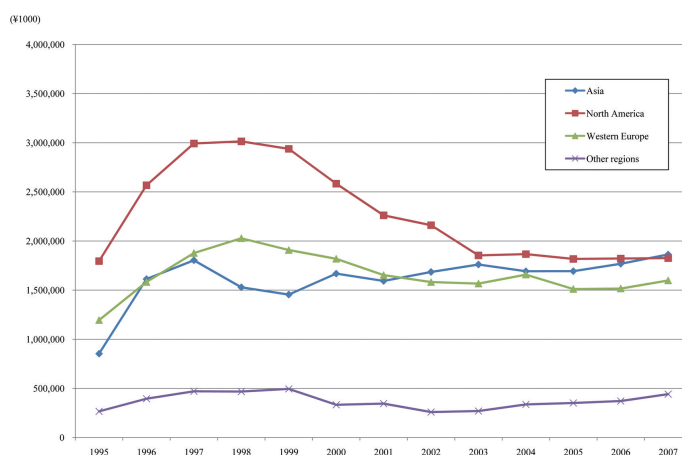
improved function of the products of competitors, low priced products that cannot be differentiated in terms of function and quality are made available on the market, resulting in fierce price competition. In the ICT-related manufacturing sector, such phenomena are often seen in semi-conductors, memory chips, personal computers and, recently, flat-screen TV sets.

(3) Global competition involving emerging economies becoming fiercer

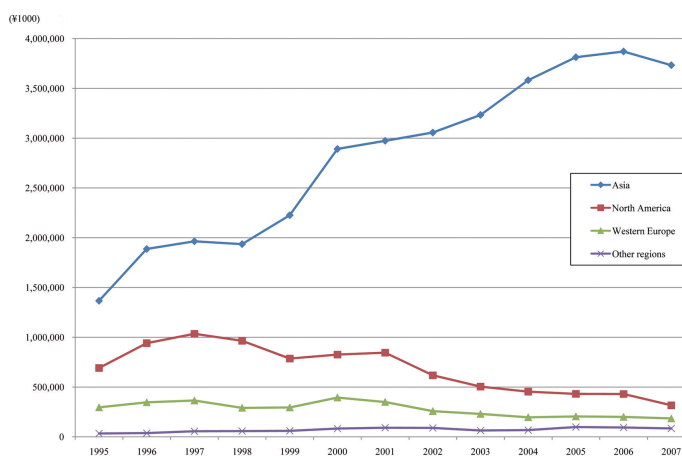
Figure 2-4 compares exports and imports by region in ICT-related manufacturing. While exports to North America and Europe have been exceeding imports consistently since 1995, imports from Asia have been consistently exceeding exports, with a characteristically marked increase in imports. Imports from Asia

Figure 2-4 Change in exports and imports by region in Japan’s ICT-related manufacturing sector

(Export value by destination)



(Import value by origin)



NB. Excluding computer terminals (excluding personal computers) and wireless telecommunication devices (excluding mobile phones)
Compiled from Trade Statistics of Japan, Ministry of Finance

rose at an annual average rate of about 8.7% between 1995 and 2007.

In the ICT industry, imports of ICT equipment from Asia are increasing and global competition is becoming fiercer involving emerging economies in addition to developed countries, such as the U.S. and Europe. Price reductions due to commoditization as mentioned earlier are largely attributed to the increasing impact of such global competition besides competition between domestic companies. Japan's ICT-related manufacturing will be required to take strategic action such as M&A by business unit and realignment of domestic and international production sites in order to address the challenge of global competition, including with emerging countries.

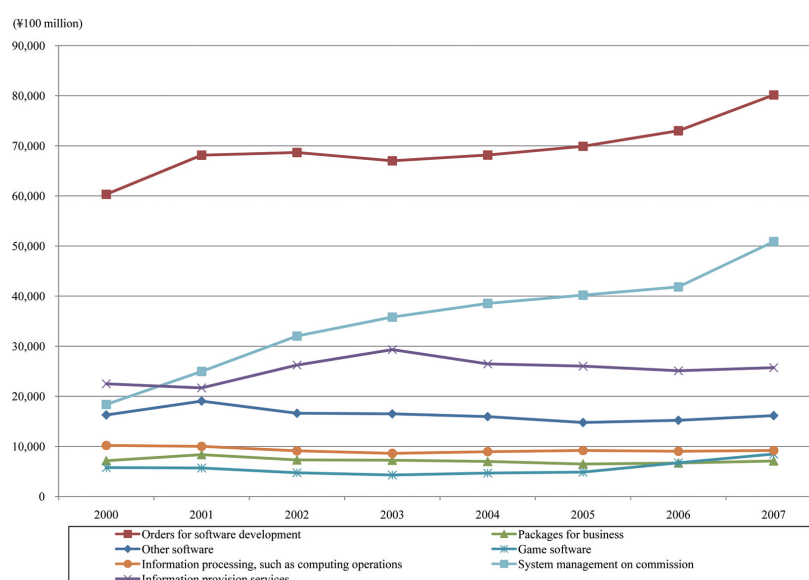
(4) Expected growth for the information services sector

The ICT-related manufacturing sector, hit heavily by a sharp decline in exports due to the global recession, is struggling and is unlikely to be able to achieve high growth in nominal terms, at least for the foreseeable future. In order to pursue sustainable growth of the entire ICT industry in such circumstances, sectors focusing on domestic services need to serve as the driving force: specifically, communications, broad-

casting, information services, ICT-related services and video/audio/text production.

Figure 2-5 shows changes in the breakdown of division-wise nominal domestic outcome of information services, which has given a particularly strong thrust to the growth of the ICT industry in nominal terms in recent years. Information services are divided into software services and information processing/provision services, which are then further divided into a total of seven divisions. As a result, even though information services continue to grow nominally, there is an increasing tendency for a lot of domestic outcome to come from orders for software development and system management on commission, resulting in a 2007 market share of 41% and 25%, respectively. These order-receiving/commission business divisions include the so-called legacy-style services together with solution-oriented services, and it is believed that these services are based on a close relationship with client corporations. On the other hand, the growth of the divisions leading to ASP¹⁶, SaaS¹⁷ and cloud computing remains at a low level although these divisions, such as general-purpose applications (packages for business, etc.), information processing, such as computation operations, and information services, are said to be the world's future mainstream.

Figure 2-5 Changes in nominal domestic outcome of information services



NB. The software business is divided into orders for software development, packages for business, other software and game software, and the information processing business is divided into information processing, such as computing operations, and system management on commission.

Compiled from Survey on Economic Analysis of ICT (2009), Ministry of Internal Affairs and Communications

¹⁶ Abbreviation for application service provider

¹⁷ Abbreviation for software as a service

Figure 2-6 shows the status of exports and imports in the information services sector. Import values largely exceed export values in the information services sector. While exports have declined, imports that have been declining since 2000 drastically increased after 2004, with the export/import ratio reaching about 4.2 in 2008.

Order receiving/consignment information services, unlike package-type software, face a language barrier (Japanese) and it is believed that pressure from global competition has not been so strong thus far. However, there are challenges arising from the spread of open-source software, which provides source codes for free, the advancement of ASP/SaaS, which are the services available on the Internet for individuals and companies to use without the need for software, and the rise of cloud computing, which allows users easy access to information services, applications and data regardless of network structure. The information services sector

needs to prepare for future global competition, not only with off-shoring services that take advantage of low labor costs in emerging economies, but also with low price services that take advantage of scale merit and free services by advertisement models by business entities in the U.S., etc. Japan's information services sector is entering a phase of fierce global competition, following in the footsteps of the ICT-related manufacturing sector.

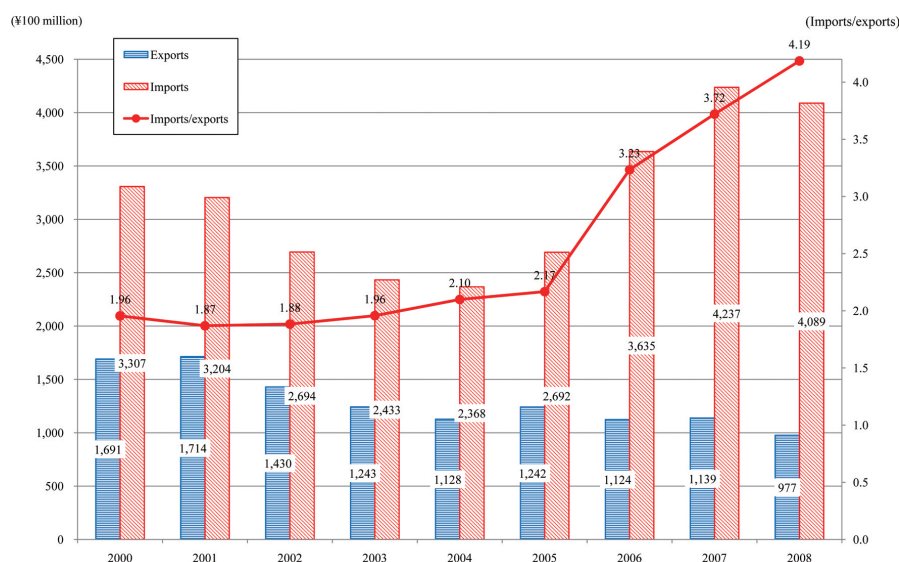
2. Signs of dynamism in ICT emerging from the industry slump

(1) Three structural changes for future growth

A. Spread of contents on the ICT market

The ICT market in Japan is considered to have a vertical layer structure comprising four layers: a contents/application layer¹⁸, platform layer¹⁹, network layer²⁰ and terminal layer²¹, and the estimates of the

Figure 2-6 Changes in export and import values of the information services sector



Compiled from Balance of Payments Statistics, Ministry of Finance/Bank of Japan

¹⁸ the production and supply of ICT-related services and contents, and the development and operation of applications and software

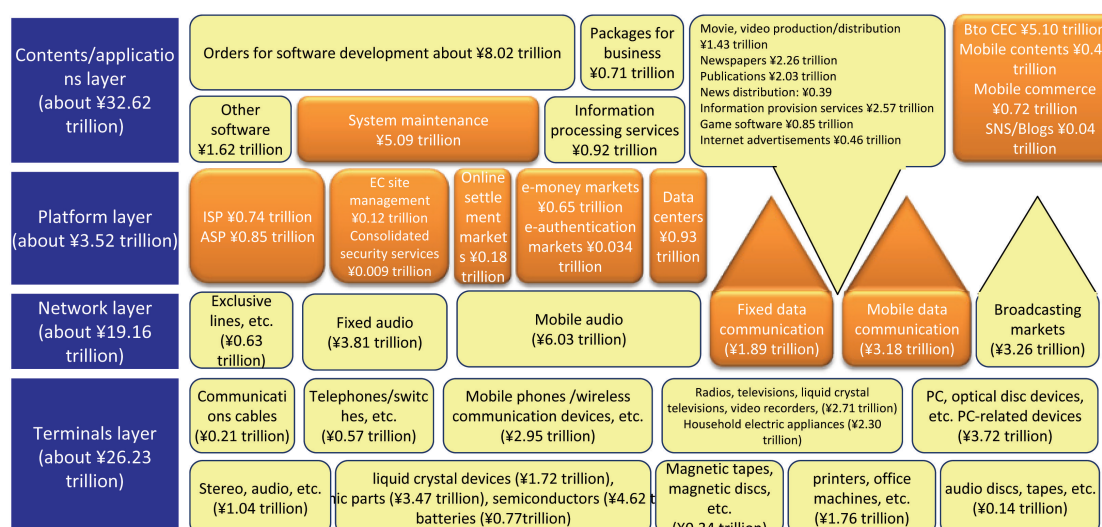
¹⁹ various authentication functions, such as user authentication, terminal authentication and contents authentication, user authentication function, billing function, patent management function, and service quality control function

market size in 2007 by layer are shown in figure 2-7. In 2007, the contents/application market was the largest with about ¥33 trillion, platform, about ¥4 trillion, network, about ¥19 trillion and terminals, about ¥26 trillion. Application/contents, the largest layer, registers nearly 10% growth, and is expected to play a central role in the ICT industry in the future.

B. Growth of the Internet as a media outlet

Figure 2-8 shows changes in advertisement expenditure. Internet ads have increased rapidly since around 2002, exceeding radio in 2004 and magazines in 2006, and almost catching up with newspapers. A drastic structural change is occurring in media outlets, which are responsible for information distribution to the public and corporations and play a critical role both economically and culturally, as Internet-based media is rapidly growing, substantially matching with existing media.

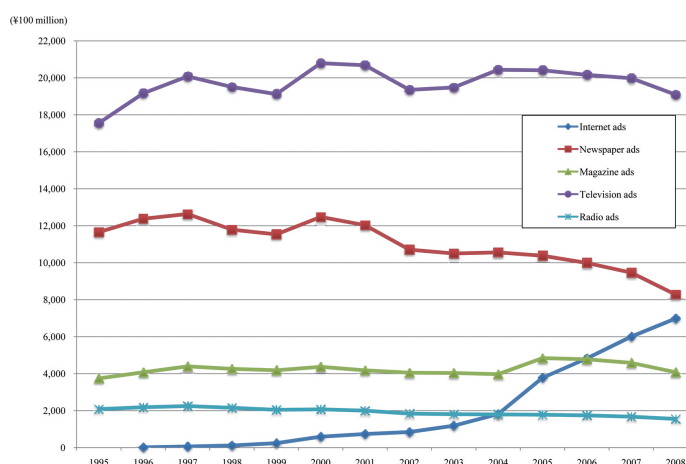
Figure 2-7 Market size by layer of ICT industry (2007)



NB. The sections in white letters are those with an annular growth rate over 10%

(Source) Quantitative Analysis of the Socio-economic Impact of the Advance of ICT (2009), Ministry of Internal Affairs and Communications

Figure 2-8 Changes in expenditure on ads using four existing media and Internet ads



2008 Advertisement Expenditure in Japan, Dentsu (revised date used for figures after 2005)

²⁰ network-based transmission, including communications and broadcasting

²¹ the manufacturing of end-user ICT terminals

C. Diversification of Internet terminals

Typical terminals for the use of the Internet are personal computers and mobile phones/PHS. Figure 2-9 shows changes in the household dissemination rate of ICT equipment. It is 85.9% for personal computers as of end-2008 and mobile phones/PHS 95.6%. A rapid penetration of Internet accessible game machines, TV sets, household electric appliances (information appliances) is taking place, with household dissemination rates of 20.8%, 15.2% and 5.5 % respectively. Diversification of terminals is steadily progressing to such an extent that an environment that allows Internet access from all terminals is imminent.

(2) Companies turning crisis into change by taking advantage of ICT

A. Internet shopping winning consumers' hearts

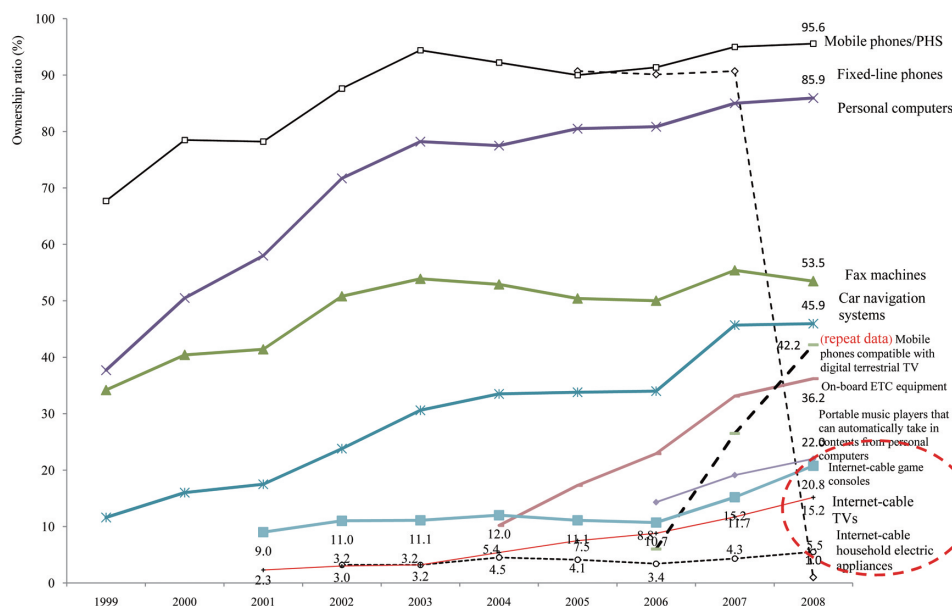
Online shopping, where consumers purchase a product via the Internet or mobile phone, is penetrating users' lives more and more each year. As for their reasons for buying goods online, people cite

"there is no need to worry about opening hours" (55.9%), "there is no need to spend time and money on transportation" (50.1%), "various products can be compared easily" (49.3%), "products not frequently available at brick-and-mortar stores can be bought" (47.0%) and "prices can be compared" (45.0%), indicating that consumers value the convenience of the Internet, in addition to price superiority (figure 2-10). The use of the ICT in this form can be a very effective tool for consumers who are cutting down their expenses at a time of recession.

B. Growing CGM services

Consumer-generated media (CGM) services²², which provide opportunities to exchange information sent by an individual, such as blogs, social networking services (SNS)²⁶, Internet bulletin boards, and video-sharing sites, are also called social media and promote communication whereby a user not only becomes a receiver of information but also a sender. Figure 2-11

Figure 2-9 Changes in the household dissemination rate of ICT equipment



(Source) Communications Usage Trend Survey, Ministry of Internal Affairs and Communications

²² It refers to media generated and process by an individual consumer on the Internet, instead of a specific editing body

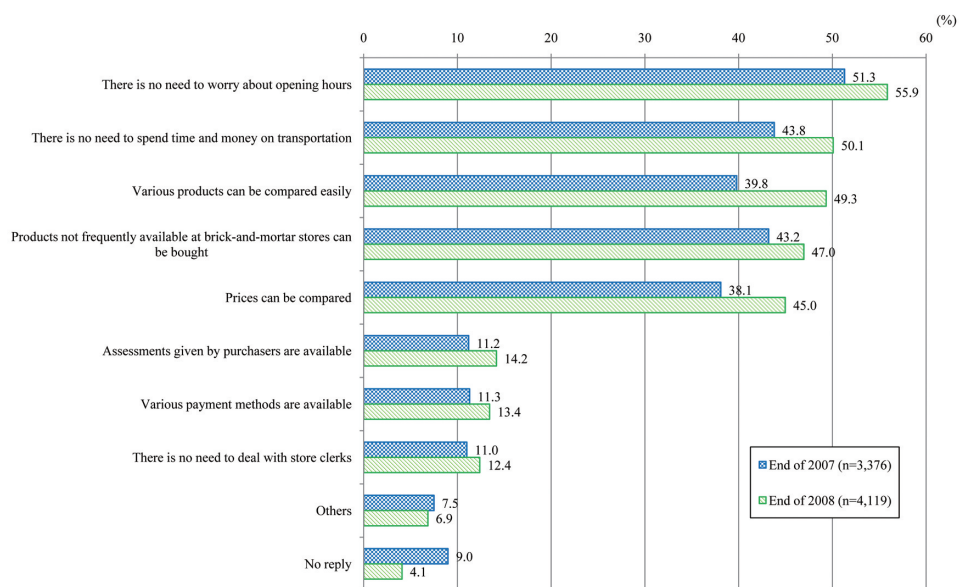
²³ Refers to a membership service that provides opportunities to communicate with friends and acquaintances or to form new

personal relations through such connections as hobbies, interests, residential area, previous school, or being a friend of a friend

shows changes in the number of users of major social media. The number of users of each media drastically increased around 2005. CGM services for mobile phone users are also dramatically growing in recent

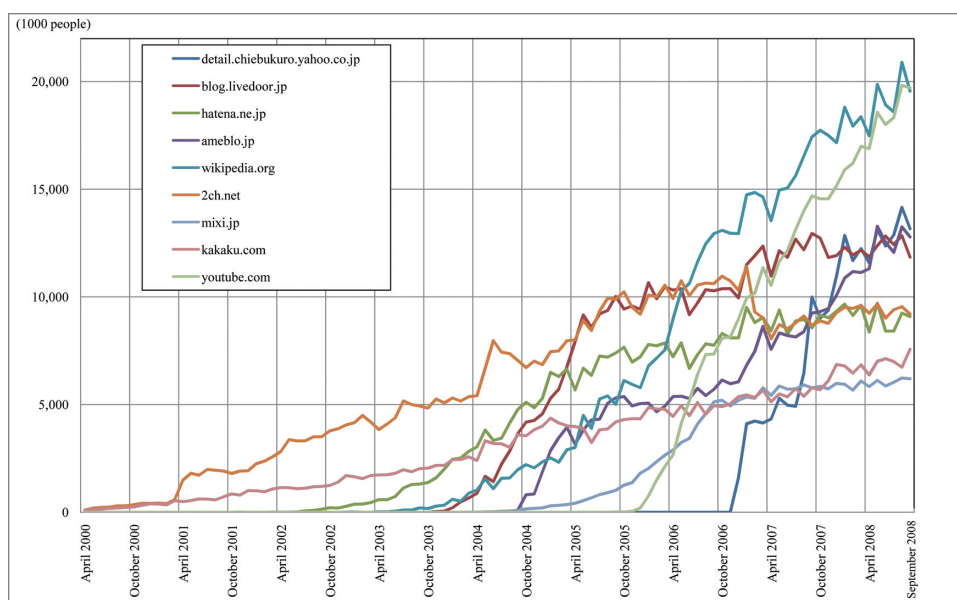
years. For instance, SNS for mobile phones has recorded more than 10 billion page-views per month²⁴.

Figure 2-10 Reasons for buying goods online (individual)



NB. Respondents were 15 years and above/ Multiple answers accepted
Compiled from Communications Usage Trend Survey, Ministry of Internal Affairs and Communications

Figure 2-11 Change in the number of users of major social media



Household access April 2000-September 2008
Source: Materials prepared by NetRatings Japan

²⁴ See "GREE, Access from Mobile Phones Exceeded 10 billion PVs-Recording the Same Level of Access as Mixi" CNET Japan (March 2, 2009)

(<http://japan.cnet.com/mobile/story/0,3800078151,20389153,00.htm>)



Section 2

Japan's ICT Lagging Behind in Overall Evaluation

The previous section evaluated the current situation and problems facing Japan's ICT industry, and this section conducts two types of international comparisons in order to objectively analyze how advanced Japan's ICT is. First, we will look at an outline of the overall international evaluation of Japan's ICT based on the ICT competitiveness rankings by the World Economic Forum (WEF). Next, to understand the current status of Japan's ICT more accurately, an independent international comparison will be conducted from three viewpoints: ICT infrastructure, utilization and security.

1. Evaluation by ICT competitiveness rankings

Figure 2-12 shows changes in the ratings of major economies in the ICT competitiveness rankings²⁵ developed by the WEF. Japan was ranked 8th in 2004 but has remained low in recent years at around 20th position: ranked 19th in 2007 and 17th in 2008. Denmark and Sweden occupied the first and second positions for three years in a row, and seven European countries, led by the Northern countries, have secured top 10 rankings. In North America, the United States has been placed third, and in Asia, Korea has been ranked 11th, and Japan is behind all these countries.

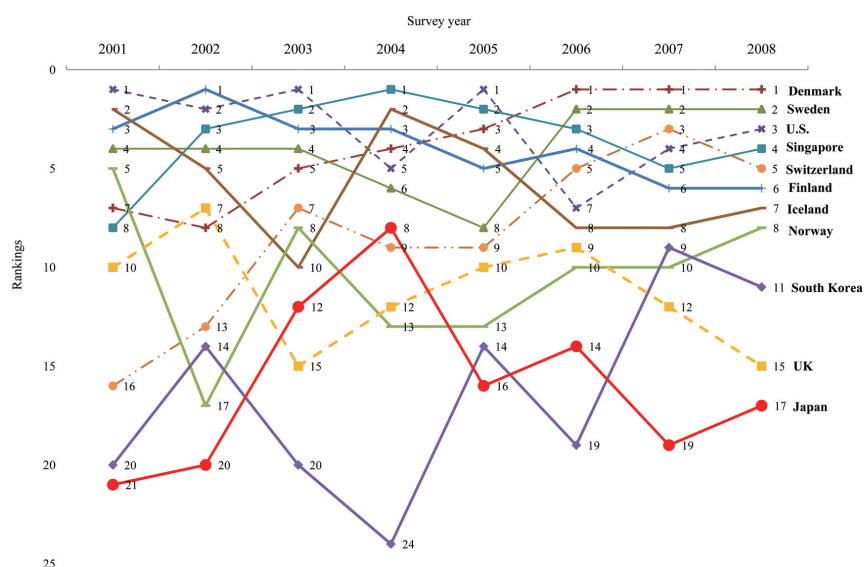
However, there are problems associated with the ICT competitiveness rankings: for example, many variables, such as tax systems, finance, education, law

and politics, are not directly related to ICT and many of the variables are qualitative ones based on questionnaire surveys conducted on a small group of experts. In order to accurately evaluate the current status of Japan's ICT, it is necessary to devise a more appropriate evaluation method, based on the direction of ICT measures implemented thus far.

2. International comparison of ICT in terms of infrastructure, utilization and security

With regard to national strategies for Japan's ICT, the development of a broadband infrastructure has been intensively promoted since the formulation of e-Japan Strategy 2001. After the formulation of e-Japan Strategy II in 2003, the policy priority has shifted from

Figure 2-12 Changes in ICT competitiveness rankings



Compiled from the Global Information Technology Report 2008-2009, WEF (2009)

²⁵ Based on ICT competitiveness index (Network Readiness Index) that counted a total of 68 indices comprising three ICT elements (total of 9 index groups): namely environment (market,

politics, regulations and infrastructure), readiness (of individuals, businesses and the government), and usage (of individuals, businesses and the government).

infrastructure development to the utilization of ICT. The promotion of u-Japan policies was launched in 2005, taking another step away from the electronic world toward the ubiquitous world, and ICT is being promoted with three keywords: infrastructure, utilization and security, incorporating a pillar of security (development of utilization environment) into the policies.

In order to objectively evaluate Japan's current status, including confirmation of the progress of ICT policies, we have performed an international comparison with countries considered advanced in ICT²⁶ (the United States, the United Kingdom, South Korea, Denmark, Sweden and Singapore) from three main viewpoints: infrastructure, utilization and security.

(1) International comparison of ICT infrastructure

A. Evaluation method

Since there is abundant quantitative data allowing for an international comparison of ICT infrastructure, instead of, like the WEF survey, simply focusing on user charges and communication speed, a balanced evaluation should use comprehensive data, including data on new technologies. Thus, an evaluation was

performed on the seven countries in terms of 12 indices in the following six areas²⁷ relating to ICT: (1) user charges (2) speed (3) security (4) mobility (5) dissemination (6) infrastructure element.

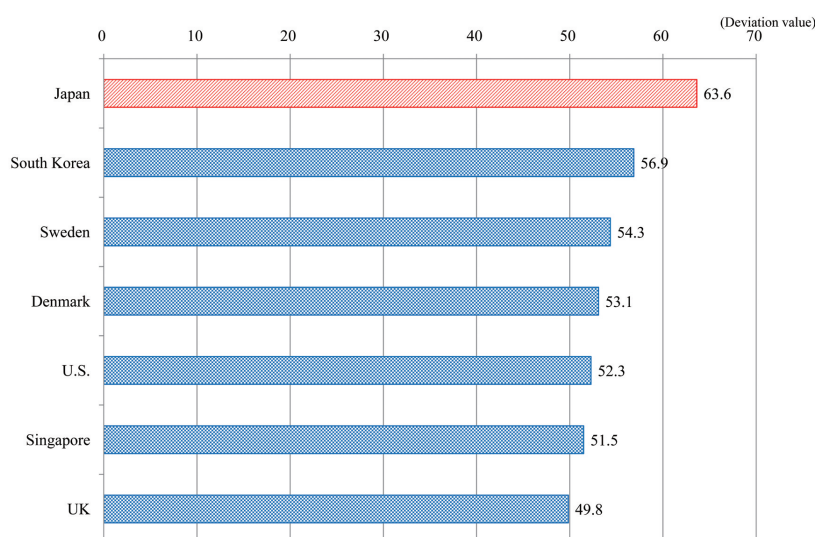
B. Overall rankings

Each index was obtained in principle by calculating the deviation value of the latest raw data disclosed by international organizations in order to eliminate arbitrariness and ensure neutrality. The overall evaluation rankings were created by calculating the mean deviations for each index for each country. Figure 2-13 is the result. Japan was ranked top, followed by South Korea, Sweden, Denmark, U.S., Singapore and UK in descending order²⁸.

C. Evaluation by individual index

Figure 2-14 show the deviation values of the 12 indices for each country. Japan took the first position in five criteria: broadband charge, optical fiber ratio, broadband speed, ratio of bot-infected PCs and ratio of third-generation mobile phones. Speed was particularly excellent and safety and mobility were also highly evaluated.

Figure 2-13 International rankings for ICT infrastructure



Compiled from the Survey on Global Comparison in Relation to Japan's ICT Infrastructure (2009), Ministry of Internal Affairs and Communications

²⁶ Total of seven countries were selected for the international comparison: the U.S. (3rd), UK (15th) and South Korea (11th) to achieve a geographical balance among the countries ranked higher than Japan in the ICT competitiveness rankings of the World Economic Forum, as well as three top ranking countries (Denmark (1st), Sweden (2nd), Singapore (4th)) and Japan (17th).

²⁷ Six areas of variables are: (1) user charges (① basic telephone charges, ② broadband cost), (2) Speed (③ optical fiber ratio, ④ broadband speed), (3) security (⑤ number of secure

servers, ⑥ ratio of bot-infected PCs), (4) mobility (⑦ ratio of third-generation mobile phones, ⑧ mobile phone dissemination rate), (5) dissemination (⑨ Internet dissemination rate, ⑩ broadband dissemination rate), (6) infrastructure element (⑪ number of Internet hosts, ⑫ ICT investment ratio)

²⁸ The Ministry of Internal Affairs and Communications conducted the Survey on Global Comparison in Relation to Japan's ICT Infrastructure (2009) in 24 countries. The figure shows the result of 7 countries among the deviations of 24 countries.

South Korea, which came 2nd, took the first place in ICT investment ratio. Optical fiber ratio, ratio of third-generation mobile phones, internet dissemination rate and broadband dissemination rate were also highly evaluated. Sweden which came 3rd, took the first place in Internet dissemination rate. Broadband dissemination rate and mobile phone dissemination rate were highly evaluated and other criteria were well balanced, with deviation values of over 50.

(2) International comparison of ICT utilization

A. Evaluation method

Next, the progress in ICT systems and utilization of services is evaluated to show how effectively the world's highest level of ICT infrastructure is being used. Since there is little quantitative data that allows for an integrated international comparison, unlike ICT infrastructure for the utilization of ICT, we conducted an online questionnaire targeting users in the aforementioned seven countries³². For the survey on utiliza-

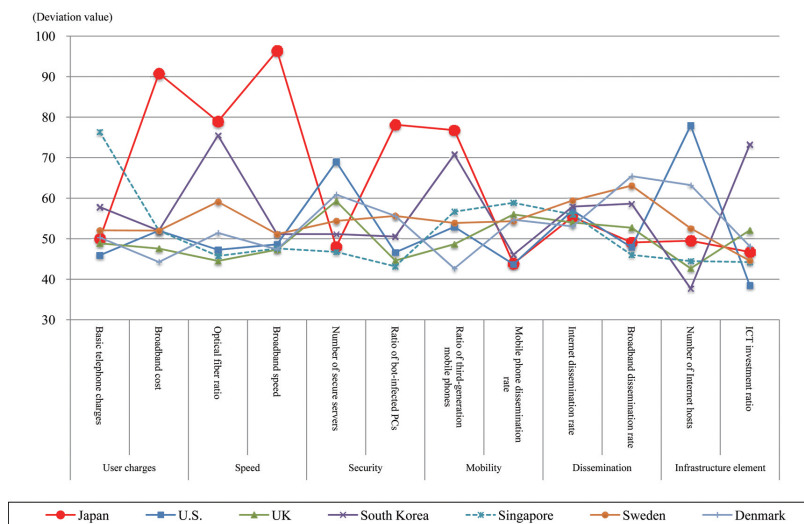
tion, the following 10 areas were set: (1) healthcare/welfare, (2) education/personnel, (3) employment/labor, (4) administrative services, (5) culture/arts, (6) corporate management, (7) environment/energy, (8) transportation/distribution, (9) security/safety, (10) e-commerce. We then presented three cases of specific ICT system services³³ for each area and asked about the overall utilization for each area.

B. Overall rankings

In order to comprehensively compare the utilization in the 10 areas for each country, the deviation value concerning utilization in each country was calculated from the mean value of the sum of the utilization rates³⁴ for each area.

As a result, as figure 2-15 shows, the most advanced country in terms of utilization was Singapore, followed by Denmark, South Korea and Sweden. Japan was ranked fifth out of the seven coun-

Figure 2-14 Deviation values by index relating to ICT infrastructure



Compiled from the Survey on Global Comparison in Relation to Japan's ICT Infrastructure (2009), Ministry of Internal Affairs and Communications

²⁹ Users in seven countries were grouped by age, and 1000 responses were returned from each country.

³⁰ ICT system services in each area include: (1) healthcare/welfare (electronic chart, pension payment simulation, etc.), (2) education/personnel (home life-long education, in-school LAN, etc.), (3) employment/labor (provision of placement information system, telework, etc.), (4) administrative services (online application, online tax declaration/taxation system, etc.), (5) culture/arts (tour information/audio information, purchase/use of internet contents, etc.), (6) corporate management (facilitation and upgrading of production and distribution process management by electronic tags, etc., B2B e-settlement system, etc.), (7) environment/energy (remote monitoring system for the usage of water, electricity gas, etc., automatic control ventilation and lighting, visualization of electricity consumption, etc.) (8) transportation/distribution (e-tickets using IC card, system to

confirm the position of goods for courier services), (9) safety/security (security confirmation system at time of disaster, danger alarm system, etc.), (10) e-commerce (settlement system by credit card or e-money, online system for financial transactions, etc.)

³¹ First, respondents were asked to choose an appropriate answer as to the use of ICT system services corresponding to each area for the following options: "Have used the service", "Have not used the service, but have heard of it", or "Have not used or heard of the service." Then, the rate of responses of "Have used the service" was regarded as the utilization rate. Among respondents, only people in employment were counted for corporate management. Employment was classed as follows: executives/officers, employees (clerical), employees (technical), employees (other), self-employed, specialists, civil servants.

tries. There are about 11 points separating the top four countries and the bottom three countries, identifying the top four countries as advanced ICT utilization countries and the bottom three as lagging behind in utilization.

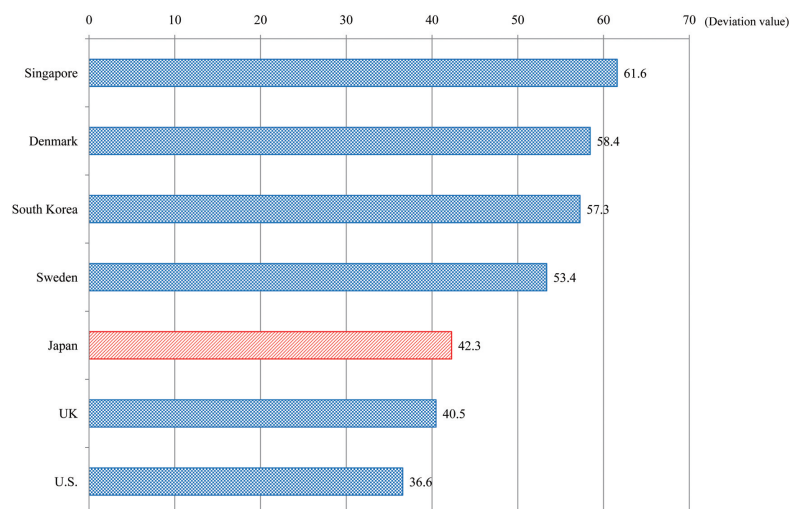
C. Evaluation by area

Figure 2-16 shows the deviation values of utilization in the 10 areas for each country. Japan's deviation values are low at less than 40 in five areas: health-care/welfare, education/personnel, employment/labor, administrative services, and corporate management.

The low score for utilization is notable. On the other hand, Japan has the highest deviation value for transportation/distribution, and has some average values for culture/arts, e-commerce, safety/security and environment/energy.

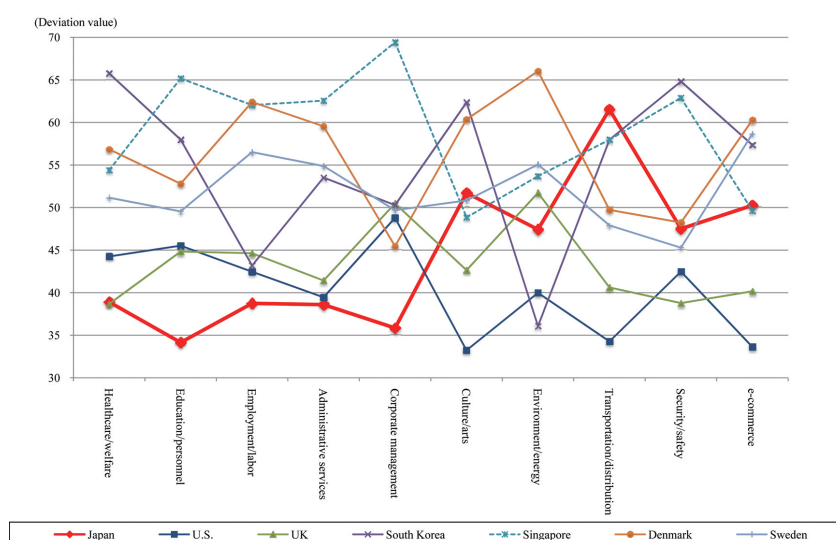
When looking at Singapore, which scored the highest marks, its deviation values are highest for education/personnel, administrative services and corporate management, and other areas are also highly evaluated. Denmark was second and has the highest scores for employment/labor, environment/energy and e-commerce, and also has high scores for

Figure 2-15 International rankings relating to utilization of ICT



NB. Deviation value was calculated from the mean value of the sum of the rate of utilization for each area
(Source) International Comparison of ICT-related Developments (2009), Ministry of Internal Affairs and Communications

Figure 16 Deviation values concerning ICT utilization



Source: International Comparison of ICT-related Developments (2009) by the Ministry of Internal Affairs and Communications

healthcare/welfare, administrative services and culture/arts. South Korea was third with the highest deviation values for healthcare/welfare, culture/arts and safety/security.

(3) International comparison of ICT security

A. Evaluation method

Since ICT security depends on subjective value judgments and there is little quantitative data which allows for an integrated international comparison as in the case of ICT utilization, we conducted an online questionnaire targeting users in the aforementioned seven countries. In doing so, we have set the following 10 areas as issues related to ICT security: (1) privacy, (2) information security, (3) e-commerce, (4) illegal/harmful contents, (5) intellectual property rights, (6) manners and social code of conduct related to ITC usage, (6) information literacy, (8) geographical divide, (9) soundness of the global environment and physical and mental health, (10) institutions and customs adopted to cyber society. We then presented

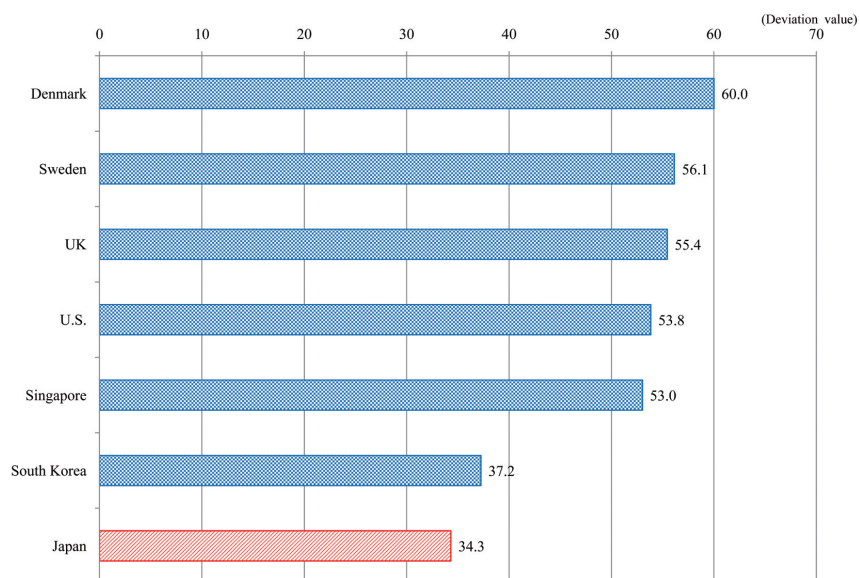
three specific issues³⁵ involved in each area and asked them about overall security.

B. Overall evaluation rankings

The responses were awarded points to comprehensively compare users' sense of security with regard to ICT in the 10 areas for each country, and deviation values regarding sense of security for each country were calculated from the sums in the 10 areas. As a result, as shown in figure 2-17, the country that scored the highest was Denmark, followed by Sweden, UK, U.S., and Singapore, with Japan the lowest after South Korea. There were about 16 points between the top five countries and the bottom two countries, and users' sense of security in Japan and South Korea is particularly low.

These survey results should be carefully evaluated. This is because sense of secure or insecure subjective and may reflect cultural background or national character. In other words, there is a possibility that a higher percentage of users of ICT in Japan feel insecure

Figure 2-17 International rankings on sense of security regarding ICT



NB. Sense of security in each area was scored in the following manner: "not feel insecure" = 2 points, "not feel relatively insecure" = 1 point, "cannot say either way" = 0 point, "feel relatively" = -1 point, "feel insecure" = -2 points
(Source) International Comparison of ICT-related Developments (2009), Ministry of Internal Affairs and Communications

³² Specific issues involved in each area are: (1) Privacy (illegal acquisition of credit card number, outflow of personal data possessed by public organizations, etc.), (2) Information security (virus infection, illicit access, including or identity fraud and defacement, etc.), (3) Illegal/harmful contents (access to illegal/harmful sites such as online dating sites, posting of defamation and infringement of rights), (4) Information literacy (lack of sufficient knowledge to use and operate ICT equipment, information divide), (5) Geographical divide (geographic divide of optical fiber and terrestrial digital broadcasting, gap between local governments' use of e-applications, etc.), (6) Intellectual property rights, (illegal distribution of pirated DVDs, illegally

downloading literature using file-sharing software), (7) e-commerce (trouble with online sellers, safety of e-settlement systems such as e-money), (8) manners and social codes of conduct related to ITC usage (lack of manners concerning use of blogs/BBC, lack of manners concerning conversations and taking photos using mobile phones), (9) Institutions and customs adapted to cyber society (incomplete online administrative services, for example, there are some products not available on the Internet), (10) Soundness of the global environment and physical and mental health (increase in energy consumption caused by an increase in the use of ICT equipment, increase in waste due to replacing ICT equipment).

partly as a result of their cultural background and national character, even though an objectively safe social infrastructure has been developed. Figure 2-18 shows such an example. When assessing safety in terms of the bot infection rate of PCs, Japan scores the highest, but the overall index for sense of security is the lowest (See Figure 2-17).

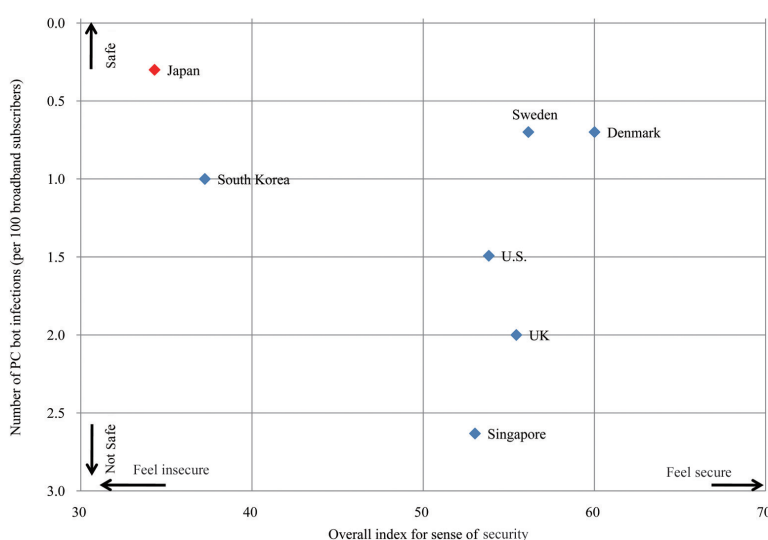
C. Evaluation by area

Bearing in mind that users in Japan and South

Korea tend to feel insecure concerns even though the ICT infrastructure is safe, as described above, let us now look at the deviation values for sense of security for each country in the 10 areas (figure 2-19).

The sense of security felt by Japanese and South Korean users is particularly low in every area, and other countries have deviation values exceeding 50, showing a bipolar tendency. The deviation values for Japan are less than 40 in every area, with particularly low values for information literacy.

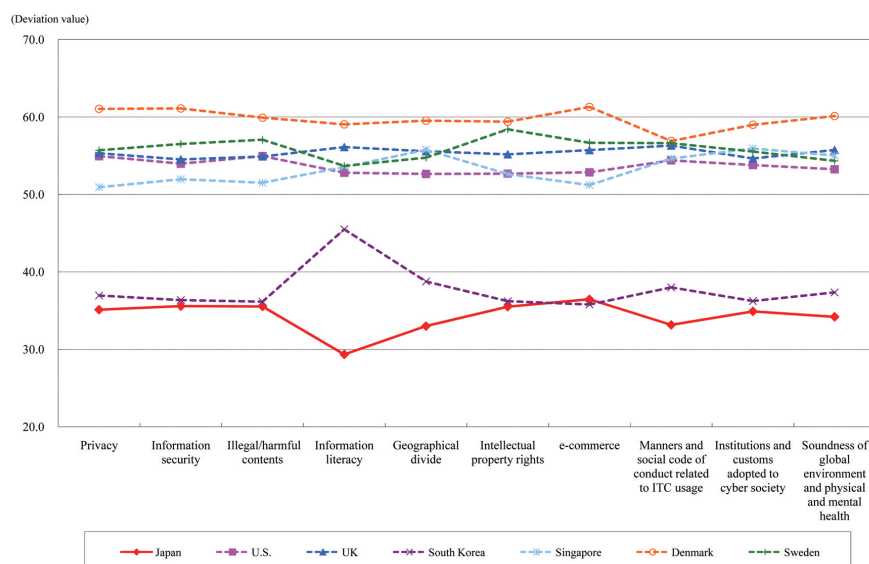
Figure 2-18 Relationship between rate of PC bot infections and overall index for sense of security



Bot infection rate of PCs: Compiled from International Comparison of ICT-related Developments (2009), Ministry of Internal Affairs and Communications

Overall index for sense of security: Compiled from International Comparison of ICT-related Developments (2009), Ministry of Internal Affairs and Communications

Figure 2-19 Area-specific deviation values concerning sense of security of ICT



Source: International Comparison of ICT-related Developments (2009), Ministry of Internal Affairs and Communications