Endnotes

Endnote 1 There are nearly 17 million Internet users in Japan <I-Introduction-1>

The number of Internet users in Japan (16,940,000) was obtained by the following formula: 16,940,000 = 93,760,000 [the number of Japanese people aged 15 to 69 as of November 1, 1998] x 18.07% [ratio of individual Internet users to all individuals]

The number of Japanese people aged 15 to 69 was the confirmed number for November 1998 in the "Monthly Estimate of the Japanese Population" by the Management and Coordination Agency. The ratio of individual Internet users to all individuals was taken from the "Survey on the Use of Telecommunications Equipment" by MPT.

Endnote 2 Internet penetration rate of 13.4% <I-Introduction-3>

The Internet penetration rate of 13.4% was obtained by the following formula: 13.4% = 16,940,000 [the number of Internet users in Japan as in I-Introduction-1] ÷ 126,520,000 [the total population of Japan as November 1, 1998]

The Japanese population was the confirmed number for November 1998 in the "Monthly Estimate of the Japanese Population" by the Management and Coordination Agency.

Endnote 3 Internet commerce <I-2-1>

The term "Cyberbusiness," which was used in past White Papers up to last year, has been redefined in this White Paper as the market for products and services via Internet commerce. This is because 1) business-to-business electronic commerce using Internet technology has expanded rapidly since 1998, and 2) the scope of market for the estimates in this year's White Paper has been confined to "transactions using the Internet."

Endnote 4 Nomura Research Institute Cyber Business Case Bank <I-2-2-(1), I-5-2-(3)>

The survey compiled by Nomura Research Institute Cyber Business Case Bank sometimes does not cover new websites opened a few months prior to the survey, because there is a delay in including such data.

Endnote 5 Internet connection terminals market (2,021.8 billion yen) <I-2-5-(1)>

The figure for the Internet connection terminal market of 2,021.8 billion yen was obtained by the following formula: 2,021.8 billion yen = 243,000 yen [average price of a personal computer] x (21,220,000 people [total number of Internet users during 1998] - 12,910,000 [total number of Internet users during 1997]

The average price of a personal computer in Japan was taken from the "1998 Annual Statistics on Machinery" by the Ministry of International Trade and Industry. Total numbers of Internet users were taken from the "Survey on the Use of Telecommunications Equipment" by MPT.

Endnote 6 Internet system development market (1,016.0 billion yen) <I-2-5-(1)>

The figure for the Internet system development market of 1,016.0 billion yen was obtained by the following formula: 1,016.0 billion yen = 932.1 billion yen [Internet-related equipment other than terminals] + 37.3 billion yen [Internet-related software] + 4.66 billion yen [Internet system development/maintenance service]

These figures were taken from the "1998 Personal Computers White Paper" by Japan Electronic Industry Development Association (JEIDA), the "Communications Usage Trend Survey" by MPT, the "Internet Commerce Survey" by MPT and other materials.

Endnote 7 Internet peripheral business market (656.1 billion yen) <I-2-5-(1)>

The figure for the Internet peripheral business market of 656.1 billion yen was obtained by the following formula: 656.1 billion yen = 5.0 billion yen [account settlement service] + 11.4 billion yen [Internet advertisement] + 3.7 billion yen [physical distribution service] + 636.0 billion yen [communications service].

These figures were taken from the "Internet Commerce Survey" by MPT and "Advertising Revenues for Major Websites in 1996, 1997 and 1998" by Dentsu Inc.

Endnote 8 Gross domestic output (111.2 trillion yen for Japan's info-communications industry) <II-1-1>

The inter-industry relations tables according to sector (hereafter referred to as "Tables of Analyses") were prepared by using the "Inter-industry Relations Tables in 1980, 1985 and 1990" by the Management and Coordination Agency as well as the "1995 Inter-industry Relations Table (updated table)" by the Ministry of International Trade and Industry.

First, a table of input coefficients for 1997 and the final demand converter for each of these input coefficients were estimated by taking trends into consideration, and using the above Table of Analyses. In addition, the final demand figures for 1997 were estimated from the assumption that growth rates for these figures were the same as those for final demand items from 1995 to 1997, as indicated in the "Annual Report on National Accounts" by the Economic Planning Agency. Also, adjustments were made to the amounts of imports in price according to sector as of 1997. Finally, the gross domestic output according to sector was obtained by multiplying the final demand figures according to sector by inverse matrix coefficients in the form of $(1-A)^{-1}$.

Endnote 9 Gross value added (47.3 trillion yen for Japan's info-communications industry) <II-1-2>

The figure for the gross values added according to sector was obtained by the following formula: the gross values added according to sector = gross domestic output - amount of intermediate input [= gross domestic output according to sector (Endnote 8) x input coefficients (Endnote 8)]

Endnote 10 Total factor productivity (TFP) <II-1-3>

The TFP growth rate was obtained by the following formula: TFP growth rate = growth in production - growth in inputs [labor input growth + capital input growth + intermediate input growth].

The figure for "production" was the real gross domestic output in the "Table of Analyses."

To obtain the figure for labor input, the number of employees was multiplied by working hours taken from the "Monthly Labor Statistics" compiled by the Ministry of Labor, and then adjustments were made using the figure for salaries taken from the "Monthly Labor Statistics" as the deflator. To obtain the amount of capital input, adjustments were made to the figures for fixed assets depreciation in the "Table of Analyses," using the total fixed assets formulation deflator indicated in the "Annual Report on National Accounts" compiled by the Economic Planning Agency. (In deciding the ratios of the amount of labor input and capital input, the salaries and the amounts of fixed assets depreciation indicated in the "Table of Analyses" were used, respectively.)

The figure for intermediate input was taken from the "Table of Analyses."

Endnote 11 Number of employees (3,871,000 in Japan's info-communications industry) <II-1-4>

The employment tables according to sector were prepared using the "Inter-industry Relations Tables in 1980, 1985 and 1990" by the Management and Co-ordination Agency as well as the "1995 Inter-industry Relations Table (updated table)" by the Ministry of International Trade and Industry.

To obtain the total number of employees for 1997 in the Japanese info-communications industry, first, the labor productivity in 1997 (tentative) was estimated from an assumption that trends in the sector's labor productivity (gross domestic output ÷ number of employees) marked in each year from 1990 through 1995 subsequently continued. Then, the number of employees (tentative) was obtained by dividing the 1997 gross domestic output by the 1997 labor productivity. Finally, the numbers of employees (tentative) according to sector were proportionally adjusted in accordance with the growth rates of the numbers of employees from 1995 to 1997 indicated in the "Annual Survey of the Labor Force" by the Management and Coordination Agency.

Endnote 12 Gross value added for intracompany IT activities (6.9 trillion yen in non-info-communications industries) <II-1-5>

The people who conduct IT activities inside a company were defined as those engaged in "occupations that use mainly electronic means to produce, collect, process, store, provide and transmit a range of information," namely IT engineers, computer operators, key punchers and those in communications services (except for postal service personnel and clerical workers). Then, a table was created showing numbers of employees according to occupation and sector, including those for IT-related occupations and categories in the info-communications industry.

Next, additional data was added to the table showing incomes according to occupation sector, calculated by multiplying the aforementioned numbers of employees according to occupation by the standard salaries of each occupation. (In adding these results to obtain the total income for each sector, adjustments were made in accordance with the incomes indicated in the "Table of Analyses.") Based on this data, the incomes of those employed in the IT industry and those employed in non-IT industries were calculated separately.

Of the incomes of employees, the portions resulted from gross value added in intracompany IT activities were calculated separately for those employed in the IT industry and those employed in non-IT industries, according to the classification used in the data on incomes based on occupation and sector described above.

The figures for fixed assets depreciation were also calculated separately for IT-related fixed assets and non-IT-related fixed assets, based on the ratio of IT-related assets to the total fixed assets for all commercial sectors.

Endnote 13 OECD Model (domestic telephone charges) <II-7-2-(1)>

The OECD domestic telephone charge basket = flat rate [yearly basic charge + initial charge for subscribing to a wired telephone line x 0.2] + usage-sensitive rate [usage pattern set by OECD]

Charges for domestic business-use telephone services do not include value added tax; those for home-use services include value added tax.

Endnote 14 OECD Model (domestic leased circuit charges) <II-7-2-(2)>

The OECD domestic leased circuit charge basket = monthly usage-sensitive rate [depending on types of circuits as well as the number of circuits for each distance designated by OECD]

Endnote 15 Tokyo Model <II-7-2-(3)>

The Tokyo cellular phone model = monthly basic charge + usage-sensitive rate [the most common charging pattern in Japan]

Endnote 16 Corporate Service Price Indexes (CSPI) <II-7-3>

The decline of 20.4% in the CSPI between 1985 and 1997 was revealed by extending the difference between the base data for 1985 and that for 1990 to 1997, since there were no consistent indexes from 1985 throughout 1997.

The price index for telecommunications service charges referred to in II-7-3 was the weighted average of price

indexes for both domestic and international telecommunications service charges as of 1990. When the price index for telecommunications service charges in 1990 was set at 100, the index for 1985 was 108.5 and that for 1997 was 86.3. Thus, the rate of decline in the price index from 1985 to 1997 was: 20.46% = (108.5 - 86.3) ÷ 108.5 x 100

Endnote 17 Effects of telecommunications tariff reductions <II-7-3>

The effects of telecommunications tariff reductions were calculated using the following price models based on the "Table of Analyses."

(A) $OP = PD^{1-M} \times PM^{M}$

(B) $PD = OP \times \Sigma A_{ij} + VA$

OP: Prices of goods and services supplied domestically

PD: Prices of goods and services produced domestically

PM: Prices of imported goods and services

M: Ratio of imports to goods and services produced domestically [weight]

$OP \times A_{ij}$ [input ratio]: costs of intermediate inputs [raw materials]

VA: Value added costs

Each industry, however, set certain values for these variables.

In analyzing the effects of telecommunications tariff reductions, the following default figures of OP = 1, PM = 1 and PM = 1 were given to these variables, so OP in the telecommunications sector became 0.7954 = 1 - 1 x 20.46 ÷ 100, when telecommunications service charges fell by 20.46%.

As a result, model (B) rendered smaller figures for sectors other than the telecommunications industry that use telecommunications services, indicating price drops in goods and services produced by these sectors domestically. Model (A) also rendered smaller figures for these sectors, indicating price drops in goods and services supplied domestically. In addition, model (B) gave smaller figures for other fields, indicating price drops in goods and services produced domestically by other fields as well.

These convergence formulas provided evidence that telecommunications tariff reductions had prompted the fall in prices for goods and services produced according to sectors other than the telecommunications sector.

Endnote 18 Increased real consumption (930 billion yen) as a result of price reductions <II-7-3>

The following function (C) was created to calculate the increase in real consumption. To measure the increase, calculations were conducted for various consumer goods and the results were added. (C) log [amount of real consumption] = $\alpha + \beta$log [nominal income ÷ standard price]

α, β: coefficients

Reductions in telecommunications service charges resulted in a drop in the "standard price," thereby enlarging the nominal income ÷ standard price ratio. Thus, the figure for real consumption on the left of this equation became larger. The 930 billion yen increase in real consumption was the total of increases in real consumption for each consumer good. The figure 930 billion yen is equivalent to about 0.02% of Japan's real gross domestic product (GDP) of 345 trillion yen in the year 1985.

Endnote 19 Spending on info-communications <II-9-2-(3)>

Spending on info-communications refers to the sum of expenditures on the following items listed in the "Family Income and Expenditure Survey" by the Management and Coordination Agency (the name of the items are taken from the 1998 survey).

[Hardware/equipment]

Communications devices (telephone, cellular phone, facsimile, radio equipment, communications device parts and peripherals, etc.), television set, stereo, personal computer, word processor, TV game console, VCR, video camera, audio-video disk, tape recorder, and other entertainment consumer goods (radio, photocopier, "karaoke" terminal, CD player, handheld computer, electronic dictionary, etc.)

[Software/services]

Telephone charges, broadcast subscription fee

Unused and recorded audio and video tapes and disks

Endnote 20 Free time <II-9-3-(3)>

Leisure activities referred to in the "Japanese Time Use Survey 1995" by NHK include the following.

Communication and social gatherings (meeting and/or talking by telephone with family members, friends and acquaintances)

Activities (sports, going for a walk, hobbies, entertainment and study)

Use of media (TV and radio broadcasting, newspapers, magazines, books, comic books, CDs, audio tapes and videos)