CHAPTER 2

Current Status of Information and Communications

The Information and Communications Industry

1 Gross domestic output

It is estimated that the real gross domestic output of Japan's information and communications industry in 1999 totaled ¥108.9 trillion, which accounted for 11.4% of total real domestic output by all industries. A breakdown of this total output by industry indicates that information and communications topped construction and ranked as the largest-scale industry in terms of real gross domestic output (Exhibit 33). Within the information and communications industry, the sector with the largest output in 1999 was information and communications equipment with output of ¥28.4 trillion, while information and communications services ranked second with ¥25.1 trillion.

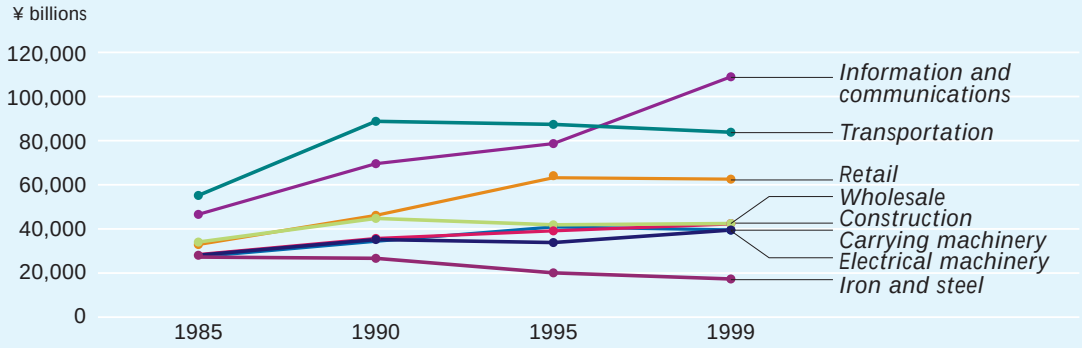
2 Gross value added

The nominal gross value added of Japan's information and communications industry in 1999 was ¥49.0 trillion, or 9.4% of the total domestic figure for all industries. A comparison with other major industries in terms of nominal gross value added shows that while the field of information and communications ranked below construction in 1990 and again in 1995, when it was also lower than the wholesale industry, this field topped both of these industries in 1999. A look at the average annual growth rate from 1985 through 1999 reveals that the information and communications industry is expanding at a brisk pace of 4.7%, which is second only to the wholesale industry's 5.2% tempo of growth. A breakdown by sector within the information and communications industry indicates that the largest amount in 1999, ¥12.0 trillion, was accounted for by information and communications services; telecommunications ranked second with ¥10.5 trillion.

3 Employment

While the number of people working in Japan's information and communications industry did register a decline from 1990 to 1995, that trend has been reversed, and employment in this industry in 1999 totaled 3,934,000 people. This was higher than the 1995 level and accounted for 7.0% of employment in all industries. Compared with other major industries, information and communications, which accounted for 3,934,000 jobs, ranked below the retail industry, which had 7,521,000 employees, and construction, which employed 5,422,000 workers. By sector within the information and communications industry, the level of employment in information and communications services, which consistently employed more workers than other sectors from 1985 through 1995, stood at 1,206,000 people in 1999, which was about 30% of the total for the industry.

Exhibit 33. Trends in Real Gross Domestic Output by Industry



	1985	1990	1995	1999	Average annual growth rate (1989–1999)
Iron and steel	27,239	26,677	20,093	17,318	-3.2%
Electrical machinery	28,082	35,188	33,826	39,489	2.5%
Carrying machinery	34,039	44,772	41,856	42,439	1.6%
Construction	55,171	88,760	87,368	83,813	3.0%
Wholesale	32,928	46,139	63,201	62,554	4.7%
Retail	28,400	35,677	39,121	42,246	2.9%
Transportation	27,362	34,392	40,897	39,558	2.7%
Information and communications	46,589	69,565	78,664	108,936	6.3%

Source: *Survey of IT Economic Analyses*

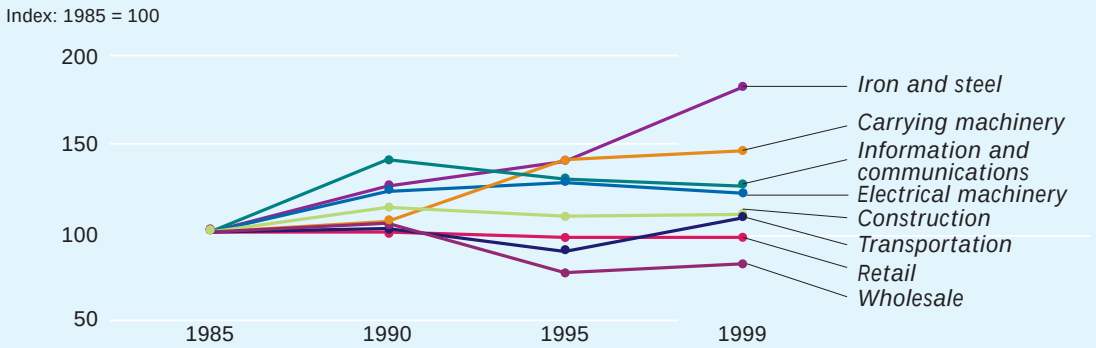
4 Productivity

Labor productivity of the information and communications industry (real gross domestic output divided by the total number of persons employed) amounted to ¥27.69 million in 1999. This statistic has been rising steadily since 1985, and the tempo of this increase has been picking up speed ever since 1995. Among all industries, the largest average annual increase between 1985 and 1999, 4.4%, was recorded by the information and communications industry (Exhibit 34). For sectors within this industry, the highest average annual growth rate from 1985 through 1999 was 13.1% in the telecommunications sector, whose 1999 figure of ¥58.56 million was approximately five times the amount in 1985.

5 IT investment

A look at the pattern of investment in information and communications technology (IT) by the private sector in Japan shows that the level of IT investment grew in 1999. It totaled ¥18.3 trillion, which was a 13.2% increase over the previous year and 1.5 times the 1995 level (Exhibit 35). IT investment as a percentage of Japan's gross domestic product (GDP) rose four-tenths of a point from 3.1% in 1998 to 3.5% in 1999. Likewise, IT investment as a percentage of total private-sector capital spending also grew, rising a substantial 3.5 points from 19.3% in 1998 to 22.8% in 1999 and exceeding 20% for the first time.

Exhibit 34. Labor Productivity per Employee by Industry

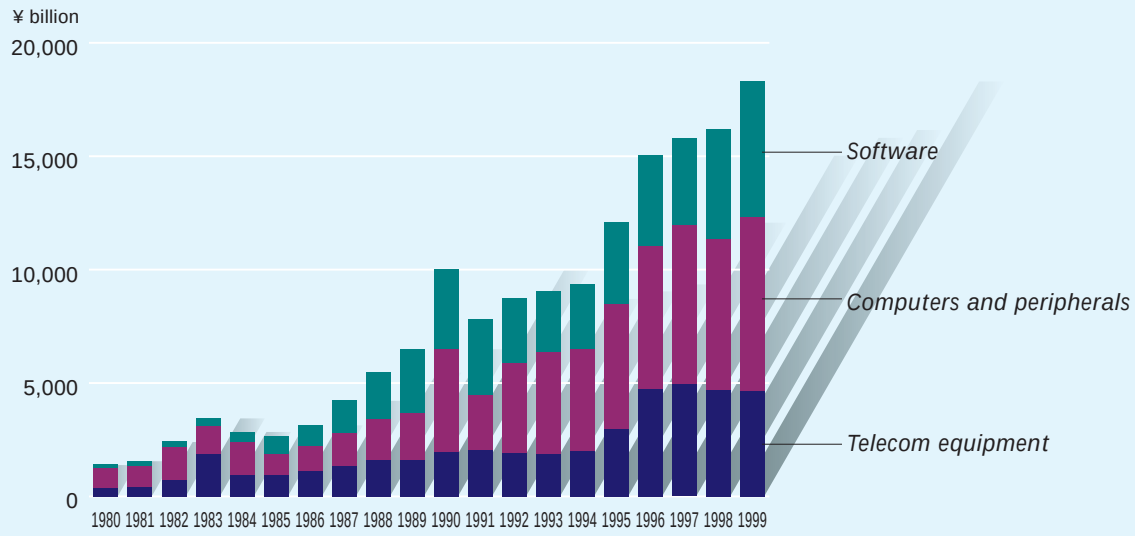


¥ thousand

	1985	1990	1995	1999	Average annual growth rate (1989–1999)
Iron and steel	65,292	68,549	50,297	53,596	-1.4%
Electrical machinery	25,581	26,065	22,736	27,504	0.5%
Carrying machinery	36,892	42,077	40,142	40,516	0.7%
Construction	12,302	17,350	15,945	15,457	1.6%
Wholesale	9,031	9,544	12,691	13,216	2.8%
Retail	5,816	5,797	5,632	5,617	-0.2%
Transportation	10,026	12,297	12,799	12,223	1.4%
Information and communications	15,254	19,248	21,370	27,693	4.4%
Total	14,939	16,963	16,853	17,133	1.0%

Source: *Survey of IT Economic Analyses*

Exhibit 35. IT Investment



Source: *Survey of IT Economic Analyses*

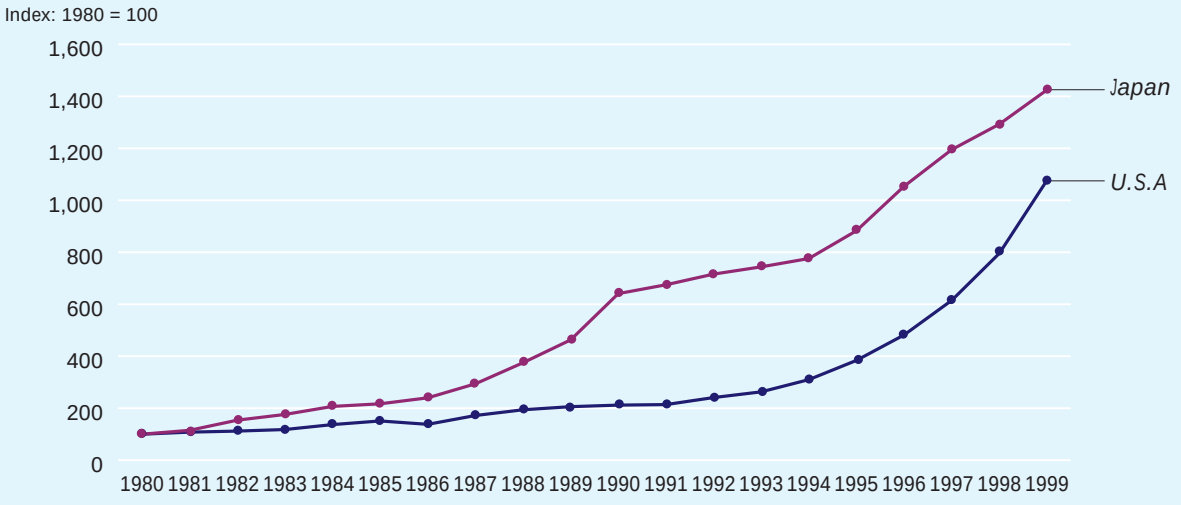
6 IT capital stock

In 1999, IT capital stock in Japan's private sector rose 10.2% over the previous year, growing to ¥40.0 trillion, which was 1.6 times the 1995 figure. Furthermore, a comparison of patterns in Japan and the United States reveals that while Japan's rate of growth for IT capital stock outdistanced the tempo of growth in the United States during the latter half of the 1980s, this rate slowed down in the first half of the 1990s (Exhibit 36). Meanwhile, the U.S. build-up of IT capital stock began to grow at a faster clip in the 1990s. IT capital stock as a percentage of total capital stock in Japan's private sector increased three-tenths of a point in 1999, rising to 3.8% from 3.5% in 1998. While there was essentially very little change in this percentage from 1990 through 1994, the ratio of IT capital stock to total private-sector capital stock has been climbing gradually since 1995. This is a sign that IT capital stock is rising sharply compared with other capital stock in Japan.

7 Capital investment

According to the Communications Industry Actual Condition Survey carried out by the Ministry of Posts and Telecommunications (MTP; now the MPHPT), the value of capital investment in communications and broadcasting in fiscal 1999 fell 4.5% from the previous fiscal year to ¥4,090.8 billion, registering a decline for the third consecutive year. Fiscal 2000 capital spending plans in the field of telecommunications and broadcasting were such that capital investment in this field was expected to fall off again, slipping 0.5% from fiscal 1999 to ¥4,069.9 billion. However, given the performance of the Japanese economy, there has been an overall tendency toward lower capital spending in industrial circles. A comparison of trends for all industries shows that as a percentage of total capital investment, the share accounted for by telecommunications and broadcasting has hovered at approximately the same level,

Exhibit 36. IT Capital Stock in Japan and the U.S.A.



Source: *Survey of IT Economic Analyses*

around 10%, since fiscal 1997.

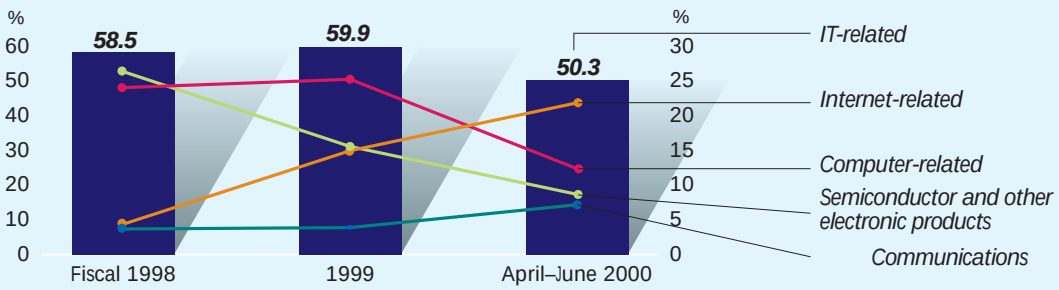
8 Sector reorganization

The October 2000 merger of three corporations—DDI, KDD, and IDO—resulted in KDDI. In the realm of foreign-owned telecommunications businesses, the British operator Vodafone's investment in Japan Telecom and the purchase of IDC by another British firm, Cable & Wireless, are examples of entry into the Japanese market from overseas. Meanwhile, among broadcasting operators, SKY Perfect Communications, an operator of broadcasting via communications satellite (CS) technology, in effect absorbed DirecTV Japan in March 2000. And in the area of cable TV, Jupiter Telecommunications and Titus Communications were consolidated into a single organization in September 2000.

9 Information and communications venture businesses

The number of businesses for the telecommunications industry in Japan was increased by 79.1% from 1996 through 1999, which represented a substantial increase compared with a generally even pattern of growth in other industries. As for bankruptcies, the 3.5% rate among telecommunications businesses was the lowest found in any major industry. A breakdown by industry in terms of where venture capital is invested shows that the share funneled into IT-related fields, despite expanding somewhat from fiscal 1998 to fiscal 1999, shrunk during the first quarter (April to June) of fiscal 2000 (Exhibit 37). Within the IT sphere, the proportion of venture funds flowing into Internet-related and telecommunications operations continued to account for an ever-higher proportion of IT-related investment even as fiscal 2000 got underway.

Exhibit 37. Venture Capital Invest by Industry



	Fiscal 1998	1999	April–June 2000
IT-related	58.5%	59.9%	50.3%
Internet-related	4.4%	15.0%	21.9%
Computer-related	24.1%	25.3%	12.4%
Semiconductor and other electronic products	26.4%	15.6%	8.7%
Communications	3.7%	3.9%	7.2%

Source: *Survey of Venture Capital Investment*, Venture Enterprise Center

Information and Communications Networks

1 Mobile telecommunications

The penetration rate of cell phones (portable and automobile) is highest in Tokyo prefecture, at more than 50 phones per 100 people. As of the end of fiscal 2000 there were no longer any prefectures with a penetration rate of less than 30 cell phones per 100 people; only a year earlier, there were six such prefectures. Miyagi prefecture has the highest Personal Handyphone System (PHS) penetration rate, with about one handset per 10 people.

2 Satellites

As of the end of fiscal 2000, Type I telecommunications carriers were using 13 satellites in geostationary satellite and 411 transponders to provide domestic services and 21 such satellites to provide international services. In October 2000, Space Communications Corp. (SCC) and JSAT Corp. successfully launched N-SAT-110, a communications satellite for joint use that is also called JCSAT 110 and Superbird D, positioning it at 110 degrees east longitude. There were four broadcasting satellites in orbit as of the end of fiscal 2000.

3 Radio stations

There were 57,478,504 radio stations—excluding PHS handsets, cordless telephones, and other terminals not requiring a license—at the end of fiscal 1999, up 22.4% year over year. This strong increase was due to the growing popularity of cell phones (classified in the "land mobile station" category, which numbered 54,447,743, up 24.3%) and an ongoing increase in the number of base stations (to 839,142, up 6.9%).

4 The postal network

Post offices are found in every municipality in Japan to ensure equitable service for all. At fiscal 2000 year-end there were 24,778 post offices, 175,570 mailboxes, 151,838 postage stamp sales agencies and revenue stamp sales agencies, and 82,488 Yu-pack (parcel post) agencies (figures for all but the number of post offices are preliminary).

3 Development of Information and Communications Services

1 Telecommunications carriers

During fiscal 2000, 1,486 new carriers reported to enter the Japanese telecommunications sector; there were 1,218 new carriers in fiscal 1999. The newcomers included cable TV operators acting as Type I carriers, as well as Internet service providers (ISPs), which are Type II carriers. The number of such cable TV operators and ISPs has been increasing from year to year (Exhibit 38). The total fiscal 1999 operating revenues of Type I telecommunications carriers (excluding revenues from non-telecommunications operations) amounted to ¥12,419.7 billion, up 3.3% year over year. The total operating revenues of Type II telecommunications carriers in fiscal 1999 added up to ¥918.8 billion, down 5.4% from the previous fiscal year.

2 Telecommunications services

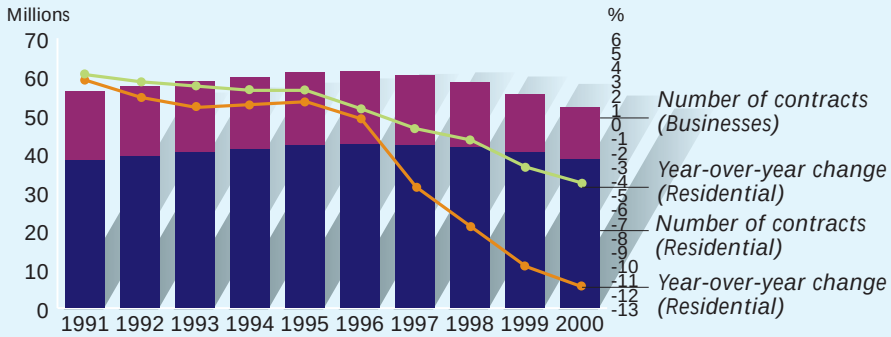
For fixed-line telecommunications services in Japan, the two regional NTT companies (East and West) had a combined subscriber base of 52.09 million as of the end of March 2001, a decline of 6.1% from a year earlier (Exhibit 39). The number of pay phones also continued to decrease and as of the end of September 2000 totaled 714,772, a 4.0% drop from the previous September. Growth in the number of cell phone and PHS sub-

Exhibit 38. Number of Telecommunications Carriers

	Fiscal 1995	1996	1997	1998	1999	2000	Year-over-year change
Type I telecommunications carries							
NTT	1	1	1	1	3	3	0
NTT docomo etc.	9	9	9	9	9	9	0
NCC (Long-distance/international carriers)	6	6	7	13	22	31	9
(Local carriers)	16	28	47	77	159	275	116
(Satellite carriers)	4	4	5	6	5	5	0
(Mobile carriers)	90	90	84	72	51	20	-31
Subtotal	126	138	153	178	249	343	94
Type II telecommunications carries							
Special (of which special Type II international)	50 (37)	78 (56)	95 (67)	88 (84)	101 (96)	113 (108)	12 (12)
General	3,084	4,510	5,776	6,514	7,550	8,893	1,343
Subtotal	3,134	4,588	5,871	6,602	7,651	9,006	1,355
Total	3,260	4,726	6,024	6,780	7,900	9,349	1,449

Source: MPHPT

Exhibit 39. Number of Contracts for NTT East's and NTT West's Services



End of fiscal year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Businesses telephone contracts										
Number of contracts	17.99	18.30	18.48	18.71	18.97	19.01	18.14	16.79	15.09	13.49
Year-over-year change	2.9	1.7	1.0	1.2	1.4	0.2	-4.6	-7.4	-10.2	-11.6
Residential telephone contracts										
Number of contracts	38.22	39.30	40.30	41.17	42.07	42.45	42.24	41.68	40.35	38.60
Year-over-year change	3.3	2.8	2.5	2.2	2.2	0.9	-0.5	-1.3	-3.2	-4.3
Total										
Number of contracts	56.21	57.60	58.78	59.88	61.04	61.46	60.38	58.47	55.44	52.09
Year-over-year change	3.2	2.5	2.0	1.9	1.9	0.7	-1.8	-3.2	-5.2	-6.1

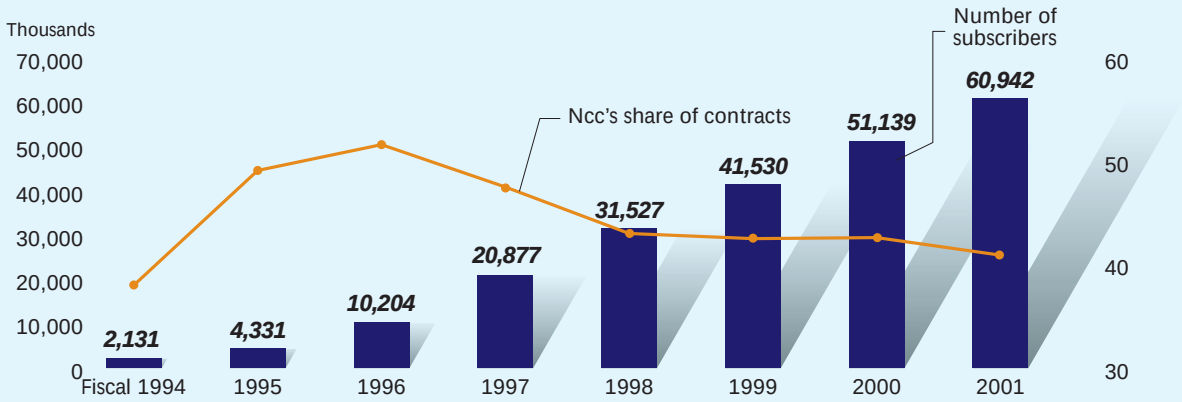
scribers is considered to be among the factors fueling this decline. For ISDN services, as of the end of March 2000 there were 9.57 million basic-rate interface lines, up 64.2% from a year earlier, and 130,000 primary-rate interface lines, up 72.6%. The volume of ISDN lines has been increasing rapidly since fiscal 1995, in part due to the growing number of Internet users in Japan.

In the realm of mobile communications, there were 60,942,000 cell phone subscriptions as of the end of fiscal 2000, an increase of 19.2% compared with a year earlier. The number of subscriptions for PHS services began to climb again, and by the end of fiscal 2000 it had reached a total of 5,842,000, up 2.4% compared with the end of fiscal 1999 (Exhibit 40).

In the area of international communications, the number of incoming and outgoing calls has followed a steady growth curve. In fiscal 1999 it totaled 799.0 million, an increase of 3.3% over the previous fiscal year. The number of pager subscriptions continued to fall off sharply, and as of the end of March 2001 totaled 1.44 million, which was 30.4% lower than a year earlier. In the realm of satellite mobile telecommunications, services utilizing, for example, the INMARSAT and N-STAR communications satellites, continued to be offered. Meanwhile, activity in the area of leased circuits included an increase in the number of high-speed lines for data transmission.

With regard to the volume of phone calls in fiscal 1999 among fixed-line telephones and mobile communications handsets

Exhibit 40. Number of Cell Phone Contracts



	Fiscal 1993	1994	1995	1996	1997	1998	1999	2000
Number of subscribers	2,131	4,331	10,204	20,877	31,527	41,530	51,139	60,942
NCCs' share of contracts	38.0%	49.1%	51.6%	47.5%	43.0%	42.5%	42.6%	40.9%

Source: MPHPT

(portable cell phones and PHS), calls placed between mobile handsets accounted for 18.1% of total call volume. This share, which represented a major increase of 4.6 percentage points over fiscal 1998, surpassed the portion of calls between fixed-line and mobile phones. Calls between fixed-line phones accounted for 63.9% of total calls in fiscal 1999, a drop of 4.3 percentage points from fiscal 1998. The total number of calls in fiscal 1999 added up to 134.39 billion, a rise of 5.8%. Total calling time amounted to 6.15 billion hours, an increase of 13.7%.

For telecommunications tariffs, using an index value of 100 for the cost of services provided to companies in 1995, the cost of domestic and international telecommunications services in 1999 stood at 86.3, which was a drop of 2.5 points. A breakdown by type of service shows a decline in the index for every category of domestic and international telecommunications services starting in 1995. Even in the case of mobile telecommunications services, based on an index value of 100 for 1995, the figure dropped 1.8 points, to 57.1, in the fourth quarter of 2000.

As for the differential between tariffs in Japan and other countries, according to an OECD model comparing fiscal 1999 domestic telephone tariffs in six cities around the world (Düsseldorf, Geneva, London, New York, Paris, and Tokyo), Tokyo had the most expensive charges for residential service. While Tokyo, along with New York, also had the highest ordinary tariffs for business telephone service, it was in third place, after New York and Geneva, in terms of discounted business rates. Although Tokyo was cheapest in terms of 64-kbps digital domestic leased circuits, it was more expensive than the other five cities for 1.5-Mbps service. Meanwhile, Tokyo's tariffs for cell phones were far more expensive than charges in Paris and somewhat higher than rates in the other four cities.

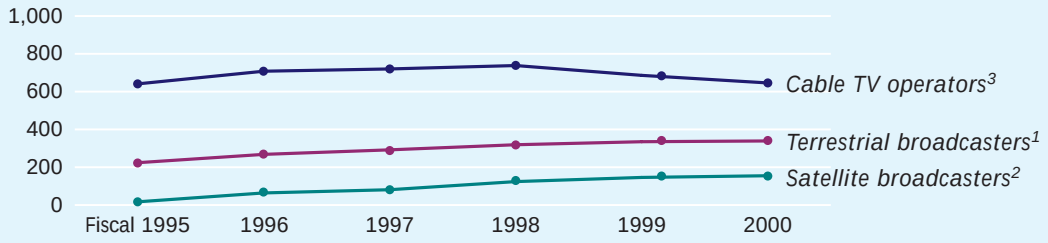
3 Broadcasters

As of the end of fiscal 2000, there were 339 terrestrial broadcasters, 155 satellite broadcasters, and 646 cable TV companies offering original programs (Exhibit 41). Operating revenues of commercial terrestrial broadcasters as a whole rose in fiscal 1999, growing 1.3% to total ¥2,473.3 billion. Commercial satellite broadcasters' operating revenues increased a substantial 21.1% during the same period to reach ¥160.5 billion. Cable TV operators' fiscal 1999 operating revenues added up to ¥224.4 billion, a 16.2% gain over fiscal 1998, and the proportion of these cable companies whose fiscal 1999 balance sheets were in the black exceeded 50%.

4 Broadcasting services

Community FM broadcasting, which was introduced in Japan in 1992, prior to the commencement of foreign-language FM broadcasting in 1995, has acquired a steadily growing presence. The number of community broadcasting stations totaled 139 as of the end of fiscal 2000. The total number of NHK subscriptions as of the end of March 2001 was 37.27 million: 26.65 million subscriptions for ordinary terrestrial broadcasting and 10.62 million for contracts also allowing reception of satellite broadcasts (Exhibit 42). In the realm of satellite broadcasting, broadcasting satellite (BS) digital broadcasting began in December 2000 and is steadily becoming more prevalent. Communications satellite (CS) broadcasting via the N-SAT-110 satellite may start as early as the end of 2001. Thanks to this progress in BS and CS operations, satellite broadcasting is expected to advance even more in the years to come. In the area of cable TV, relatively large facilities and companies that offer original programming are becoming increasingly common,

Exhibit 41. Number of Broadcasters



	Fiscal 1995	1996	1997	1998	1999	2000
Terrestrial broadcasters[1]	224	268	292	319	335	339
Satellite broadcasters[2]	17	64	81	124	146	155
Cable TV operators[3]	641	708	720	738	686	646

1. Terrestrial broadcasters include NHK and the University of the Air.
2. Satellite broadcasters include program-supplying broadcasters and facility-supplying broadcasters that use communications satellites, and excludes NHK and the University of the Air.
3. Cable TV operators are those supplying original programs.

Source: MPHPT

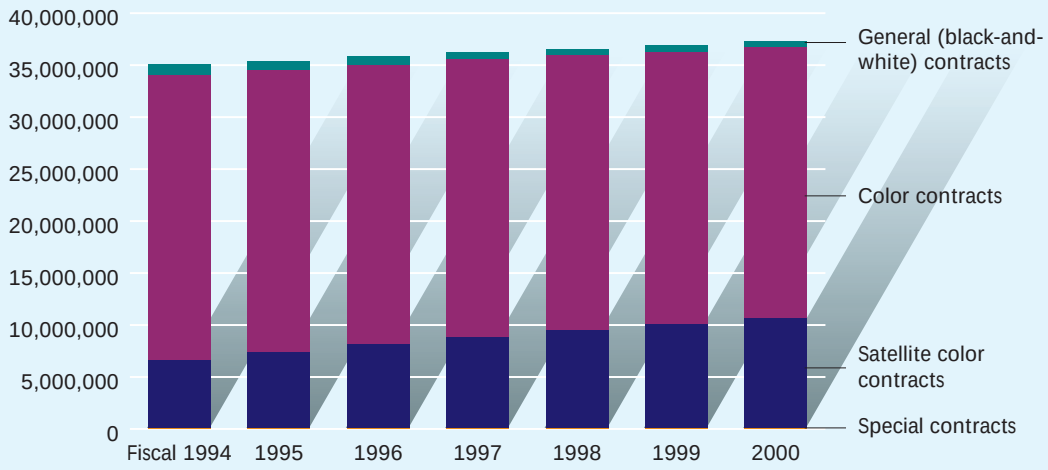
and cable TV services are diversifying.

Additionally, University of the Air programming and international broadcasting services from Japan continued to be available on a regular basis. And for the broadcast industry as a whole, figures for listening and viewing hours and time slot and broadcast tariffs were roughly the same as they were the previous year.

5 Information flow

An examination of the pattern of change in the flow of information in Japan over the last 10 years shows that this flow was expanding throughout the decade and that the rate of increase has picked up speed in recent years in particular. Moreover, a breakdown of the share by prefecture in fiscal 1999 reveals that Tokyo prefecture accounted for 17.9% of information transmitted, 13.1% of selectable information, and 10.2% of information consumed. In each case, Tokyo had the highest share nationwide.

Exhibit 42. Number Profit NHK Broadcast Receiving Contracts



	Fiscal 1994	1995	1996	1997	1998	1999	2000
General (black-and-white) contracts	970,555	865,815	799,631	733,101	667,229	610,479	541,650
Color contracts	27,475,680	27,136,595	26,844,744	26,753,715	26,465,617	26,198,692	26,111,384
Satellite color contracts	6,566,667	7,358,788	8,155,854	8,780,647	9,451,022	10,055,635	10,610,151
Special contracts	14,267	16,097	15,794	15,391	13,249	13,548	10,507

Note: The services covered by the four types of contracts are defined as follows:
General contract: Black-and-white terrestrial TV broadcasting
Color contract: Color (and black-and-white) terrestrial TV broadcasting
Satellite color contract: Satellite and terrestrial TV broadcasting
Special contract: Satellite (but not terrestrial) TV broadcasting to (1) recipients who live in regions whose topography does not allow for reception of terrestrial broadcasting and (2) commercial recipients with TVs on trains and other moving vehicles.
Source: NHK (Japan Broadcasting Corporation)

4 Information and Communications Technology

1 R&D investment

Fiscal 1999 marked a reversal in the ascent of all-industry R&D investment, which dropped off after increasing each year since fiscal 1995. R&D investment in the information and communications field, though, has continued to climb since fiscal 1994 and rose 1.9% over fiscal 1998 to total ¥3,360.5 billion in fiscal 1999. The information and communications field's share of total R&D investment in all industries has also continued to increase since fiscal 1994, and this field's investment expanded so that its percentage of the total in fiscal 1999 was 31.6%.

2 Level of research

Each year the Swiss business school IMD announces the global competitiveness rankings of countries around the world. For the past several years Japan has continued to place second in terms of science and technology, and which shows the overall level of science and technology in Japan is still high. However, the situation is such that in most cases the United States sets de facto standards with respect to operating systems, browsers, and other elements of Internet-related technologies. Furthermore, Japan generally falls far behind the United States in terms of the volume of papers presented or cited in the field of information and communications and the number of patents in this area.

5 The Postal Services

1 Overview

The Postal Service, which recorded a net annual loss in fiscal 1998, anticipates a shortfall of ¥30.3 billion in its fiscal 2001 budget. The scale of its deficit has been dwindling, however, and is expected to shrink even more in fiscal 2001.

2 Mail volume

In fiscal 2000 the Postal Service handled its largest-ever volume of mail, a total of 26.5 billion items, an increase of 1.5% over the previous fiscal year. According to a comparison of the volume of mail processed by individual countries in fiscal 1999, Japan ranked third internationally after the United States and France. In terms of the annual volume of mail per capita, however, Japan was number 18 in the world. The volume of mail per capita in the United States, which ranked first, was approximately 3.6 times the amount in Japan.

3 Services

Postal Services are improved each year so that postal customers' changing and diversifying needs can be closely accommodated. Recently, in response to such developments as the spread of computers, there has especially been an upswing, for example, in services that incorporate information technology.

4 Postage rates

Postage rates are determined in accordance with the principle that the Postal Service, which is financially independent, is to break even, with income from postal fees offsetting expenditures. One characteristic of postage for ordinary mail is that Japan has a system of uniform rates that apply nationwide. Inexpensive rates have also been established as special postage prescribed by specific social policies.

6 Trends Abroad

1 The United States

The report *Digital Economy 2000* declares that the United States has achieved low inflation and doubled productivity through information and communications technology (IT) and that the country has surged into a new age equipped with growth potential and productivity that can be sustained at a high level. In the sphere of telecommunications, which functions as the engine driving the IT revolution, the United States possesses the world's largest market. Telecommunications businesses are engaging in fierce competition, and the landscape features more and more rivalry, as well as alliances and consolidation of operations, extending even beyond the sphere of telecommunications. A new post for a chief information officer (CIO) has been created within each department of the federal government, and these CIOs have been given authority to undertake IT planning, develop proposals, and implement projects. In addition to defining six strategic objectives, the United States is taking such steps as setting specific, detailed targets in individual fields.

2 Europe

The EU is also formulating strategic plans in connection with IT promotion. A burst of activity is taking place in terms of information and communications measures and so forth as the EU revamps its framework of telecommunications regulations and develops a legal platform for electronic commerce. Measures include the eEurope 2002 concept, an e-commerce directive, a review by the EU of the region's telecommunications regulatory framework, and the Regulation on Local Loop Unbundling.

3 Asia

China Netcom, a company that was established in April 1999, is providing Internet Protocol (IP) telephony and Internet services in China. In September 2000 the Chinese government enacted a telecommunications ordinance that defined two categories of telecommunications operations: basic services and value-added services. Foreign ownership up to 49% is permitted for an operator in the basic category; there is not any restriction on the size of a foreign stake in a value-added operator. As a result of this policy, AT&T established a joint-venture company in December 2000 in Shanghai. Meanwhile, Hong Kong announced its IT strategy, Digital 21, in November 1998. The objective of this strategy is to position Hong Kong as a leading digital city in the twenty-first century. In 1999, Republic of Korea announced a five-year information and communications technology plan. Covering the years from 2000 through 2004, this plan encompasses

research and development in such areas as the next generation of the Internet and fiber-optic communications. The Cyber Korea 21 initiative, which aims to have Republic of Korea rank among the world's top 10 countries in terms of IT capabilities in 2002, was also launched. Although Singapore is currently among the most advanced countries in Asia in terms of IT—as evidenced, for example, by its Internet penetration rate of approximately 45%—in 2000 the government announced Singapore's Information Communication Technology 21 (ICT 21) Masterplan, a 10-year national plan in the field of IT starting in 2001. Meanwhile, the idea of making Malaysia a country capable of existing on the basis of its science and technology is among the objectives for national development that are spelled out in Malaysia's Vision 2020 initiative. This long-term plan, which was presented in 1991, aims toward the country's entry into the line-up of developing countries by 2020. Malaysia has identified IT promotion as a priority sector for its national development, and government-spearheaded efforts in the realm of IT policy are underway.

4 Global alliances

With the termination of the Global One telecommunications alliance between partners Deutsche Telekom and France Telecom, Global One became a wholly owned subsidiary of France Telecom in January 2000. Among international deals that involved Japanese telecom carriers, NTT DoCoMo expanded its business to include services in Britain, the Netherlands, Taiwan, and the United States and also forged an alliance with AOL. Meanwhile, NTT Communications purchased the U.S.-based ISP Verio in September 2000.

Major reshuffling continued to occur in the media industry in 2000. Developments during the year included the formation of the world's largest media titan when AOL Time Warner and Vivendi Universal joined forces. The line-up within the media industry in Japan is also in flux. Cable TV operators Jupiter Telecom and Titus Communications merged in September 2000, for example, and with the demise of DirecTV Japan, SKY Perfect Communications took over its business in October of that year.