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NEW TECHNOLOGY AND JOB OPPORTUNITIES FOR WOMEN

by

Yoko Sano

Preface

After examining the historical and intensive studies made by five researchers, M. Nakamura⁽²⁾ concluded that innovation had created many job opportunities in Japan. Especially through a shortage of manpower in the 1960's, a tremendous number of new opportunities was created electric appliance, precision and other industries. The innovation also brought about a change of industrial structure from the secondary to the tertiary industry. This enabled a large number of female workers to be absorbed in clerical, service and retail areas.

Integrated circuit minitization is another innovation of the 1970s that has had an impact on production processes different from that of previous process automation. These are fabricating industries like those for electric, industrial, transportation, and precision machinery.

N. Nakamura⁽¹⁾ carefully examined experiences with microelectronics in small manufacturing plants, and found that these had taken on more female than male workers, although large plants had decreased their number of female workers in the past decade.

The only women hired by large firms are young, and usually many quit. Once they quit large firms, it is difficult for them to be rehired as regular workers. It is easier for middle-aged and older women to get jobs at smaller firms. Nakamura warned the possibility of a "two-tier" labour market for women because of the introduction of microelectronics in manufacturing plants.

A comprehensive study of office jobs was made by Werneke⁽⁵⁾. Practices in major countries were examined in this ILO-sponsored research. The greatest impact of microelectronics was found among large firms in the U.S.A., where these areas were leading sectors of the new technology in the whole world. The direct impact was on specific routine-type-work of information dealing, and was labour-saving. But on the other hand, demand was created in the information services of large and small firms. Introduction of microelectronics to offices certainly created job opportunities, but such skills as type-writing, stenography, and bookkeeping were made obsolete. New technology required broader abilities to understand work organizations as systems, and technical or narrow

skills were no longer sufficient there. Female workers were required retraining to meet the new needs.

The content of office jobs was also greatly changed. Repetitive and boring jobs were automated. Speed and accuracy in typewriting lost their importance. The electronic office systems were sometimes decentralized and divided piece by piece. When new technology reduces the responsibility, discipline and supervision needed for a job, more and more female workers tend to be hired, because it makes office jobs like belt-conveyor jobs in factories. More participation by women will be needed in decision-making relating to new technology. Health and safety should also be carefully considered during the introduction of new technology.

On balance, women can benefit from new technology. But schools, retraining systems, and on-the-job training at establishments should be rearranged for female office workers to improve their capacity to understand problems and to participate in management.

I will examine several aspects of Japanese experiences: (1) macroeconomic trends in female employment, (2) trends in sex ratio at large leading firms, (3) women in banking firms, and (4) the recent introduction of home working system.

1. Some Trends in Female Employment

The workforce has steadily grown in Japan, and female employment has been no exception. Let us look at changes in employment, and at the same time changes in GNP over time. The oil crisis in 1973 resulted in epoch-making structural changes to the Japanese economy. I would like to cover both the period before and the period after the oil crisis: 1965 to 1985.

The total number of employees (excluding the self-employed and family employees) was 28,769,000 in 1965 and 43,130,000 in 1985. The proportion of these that were women was 31.7% in 1965 and 35.9% in 1985. The number of female employees grew faster than that of male employees over the period.

Now I would like to divide the whole period into four to compare the average rate of growth of employment. This average can smooth out yearly fluctuations. The rate of increase in the number of total employees was 2.6% for 1965–70, 1.8% for 1970–75, 1.6% for 1975–80, and 1.7% for 1980–85.

I list the average rate of growth of employment by sex for the four periods in Table 1. The growth rate after 1975 was lower for males but higher for females.

The growth rate of real GNP is also shown in Table 1 to compare with the rate of employment. The growth rate of GNP was clearly lower after 1975. In order to compare the relationships of employment to GNP among the periods I list the ratio of the employment growth rate to the real GNP growth rate in the right hand column of Table 1. The ratio is sometimes called "elasticity."

"Elasticity" means the percentage increase in the number of employees when real GNP growth by 1%. Therefore it is called "elasticity of employment to real GNP." The elasticity in Table 1 shows a remarkable difference by sex. The elasticity for men has

Table 1 Average Annual Rates of Growth of Employment and GNP, and Ratios of Employment Rate to GNP Rate (elasticity), 1965 – 1985

	fiscal year	growth rate of employment (1)	growth rate of real GNP (with one year lag) (2)	elasticity of employment to real GNP (2) / (1)
MALE	1965–70	2.4%	10.7%	0.22
	1970–75	2.4	6.6	0.36
	1975–80	1.1	4.9	0.22
	1980–85	1.1	3.7	0.30
FEMALE	1965–70	2.3	10.7	0.21
	1970–75	1.2	6.6	0.18
	1975–80	3.0	4.9	0.61
	1980–85	2.5	3.7	0.68

Source: Japan Productivity Center, *Katsuyo Rodo Tokei* (handy labour statistics), annual.

valued between 0.22 to 0.36 in these 20 years but has shown no major upward or downward trend. On the other hand, the elasticity for women rose from 0.21 to 0.68 during the same years. It was almost the same as for men before 1975, but it rose as high as 0.6 after 1975. This means that GNP growth brought three times the previous female employment growth.

The reason for this difference is most likely the growth of the tertiary industry and growth of non-regular female workers including part-time workers. Female workers have originally been largely in service-type industries. Among narrowly defined (three-digit) industries recent female employment growth is found in information service (82.3% increase between 1980 and 1985), other service for business (51.1%) and rentals of commodities (46.8%). As for professions, sports instructors, social workers, and writers were the three categories which showed the greatest increases.

The ratio of part-timers to female employees was only 12.2% in 1970, but grew to 22.0% in 1985. Constructing-type and staff-rentals (temporary help) also showed an increase. Home working system is still at the time of introduction but shows a sign of gradual increase. Incidentally, the total number of regular employees of the national government was 487,000 in 1987, and women accounted for exactly 20% of these. In the public sector women employees are expected to be treated equally with men. The female ratio in the public sector is high in most western countries, but not so much in Japan.

2. Trends in Female Ratio at Large Leading Firms

Practices at large firms are often followed by other sectors of the economy in Japan. One reason might be that they have a number of related firms, and sub-contractors, and many customers. They have more or less influence on such subordinate areas. The other reason might be that large representative firms have *normative* influences on other firms

and organizations although they have no formal linkages with others. This is especially so when the society is well-informed through mass media like today.

What are such representative large firms? There is no definite criterion to identify them. As a preliminary approach 68 large firms were chosen in order to examine changes in the ratio of women employees to the total. They were not systematically chosen. Any criterion such as number of employees and stock capital would make bias the sample toward manufacturing firms.

A number of firms were chosen from a variety of industries, and some emphasis was put on tertiary industries. Some of these tertiary-industry firms were founded during the observation period.

The observation period is from 1968 to 1986 at six-year intervals. It consists of a period with rapid economic growth (1968–74), and one with lower economic growth (1974–86). The period of 1974–86 has one observation point in 1980. Consequently the whole period has four points of observation: 1968, 1974, 1980, and 1986.

It should be noted that statistics of number of employees usually contain only regular employees. Large firms generally hold a complex of various categories of working people in addition to regular employees: temporary workers, part-timers, contractors, sub-contracting workers, seasonal workers, trainees, associates, temporary help and so forth.

Regular employees make up a core group of all the people working for a firm. Female employees have generally been in positions assisting male employees at large firms, because their length of service for females has been short and their average age low. There are signs of changes though, but evidence is not yet clear.

Table 2 shows the ratio of female employees by firm. The number of total employees is also shown in parenthesis. Firms which had some structural changes, such as merger, during the period were omitted, and developing firms in the tertiary industry were added. Some firms grew to prominence during this period. Naturally some giant manufacturing firms were not included because the number of the total was limited.

Office automation is expected to have an impact on female office workers. In industries now having low female ratios, e.s., steel, autos, printing, and energy, most of the women are office workers. Other industries have higher female ratios: textiles, retail trade, finance, securities, and insurance. The women in these firms work in all kinds of jobs. Microelectronics also has a great impact on these women but in different ways.

There seem to be several patterns of large firms, judging from changes in the female ratio shown in Table 2, as follows:

(1) On the whole, many firms show a decrease in the female ratio during the 1968–86 period. These firms belong not only to manufacturing (with production lines) but also to the tertiary industry.

Mr. Terao, personnel manager at Marubeni Corporation stated that female employees had been replaced by electronic office equipment and that the number today is just two-thirds of that of ten years ago. (*The Asahi Shimbun*, morning edition, August 7, 1987. p. 15)

(2) Some firms show a rather stable female ratio after 1974, but among others

Table 2 Changes in Female Ratio among 68 Leading Firms
with Number of Employees 1968-86

		% (thousand)			
		1968	1974	1980	1986 (or 1985)
foods	Snow Brand Milk Products Co., Ltd.	11 (10.1)	13 (10.6)	9 (9.9)	7 (8.8)
	Yamazaki Baking Co., Ltd.	34 (3.6)	27 (4.7)	23 (7.1)	20 (7.8)
	Kirin Brewery Co., Ltd.	21 (6.6)	21 (7.9)	20 (7.9)	18 (7.5)
textiles	Asahi Chemical Industry Co., Ltd.	24 (17.3)	19 (18.0)	12 (13.5)	11 (15.7)
	Toyobo Co., Ltd.	67 (28.4)	59 (24.0)	49 (13.9)	50 (10.6)
chemicals	Mitsubishi Chemical Industries Limited	15 (7.5)	13 (8.7)	12 (8.0)	13 (8.1)
medicines	Shionogi & Co., Ltd.	41 (6.1)	40 (7.2)	35 (6.7)	32 (6.6)
	Sankyo Company, Limited	32 (6.1)	29 (5.8)	26 (5.2)	25 (5.4)
oil	Maruzen Petrochemical Co., Ltd.	14 (4.6)	17 (4.9)	14 (4.6)	17 (1.6)
	NIPPON OIL COMPANY, Limited	24 (3.0)	26 (3.0)	24 (3.0)	20 (2.7)
rubber	The Yokohama Rubber Co., Ltd.	8 (7.1)	8 (9.8)	6 (8.0)	6 (6.7)
steel	NIPPON KOKAN K.K.	6 (37.5)	6 (39.3)	6 (33.6)	7 (32.4)
	Kobe Steel, Ltd.	8 (29.0)	11 (34.9)	8 (31.1)	8 (27.9)
electric appliances	Hitachi Co., Ltd.	22 (74.9)	17 (80.9)	13 (71.8)	14 (79.1)
	Toshiba Corporation	30 (61.5)	22 (71.5)	14 (63.9)	13 (69.3)
	Mitsubishi Electric Corporation	20 (87.7)	21 (80.2)	12 (59.3)	13 (51.7)
auto-mobiles	NISSAN MOTOR CO., LTD.	7 (40.2)	9 (52.8)	9 (56.7)	9 (57.6)
	TOYOTA MOTOR CORPORATION	6 (32.3)	6 (44.2)	6 (47.1)	10 (61.7)
	Honda Motor Co., Ltd.	5 (11.3)	7 (18.3)	8 (20.8)	6 (28.1)
precision	CANON INC.	48 (4.8)	34 (4.9)	35 (8.3)	31 (14.2)
	RICOH COMPANY, LTD.	30 (1.3)	19 (1.5)	17 (1.6)	14 (1.3)
	MINOLTA CAMERA CO., LTD.	48 (3.1)	48 (5.0)	43 (5.7)	34 (6.1)
other manufacturing	DAI NIPPON PRINTING CO., LTD.	3 (7.0)	9 (13.3)	8 (9.8)	9 (10.9)
	TOPPAN PRINTING CO., LTD.	9 (6.2)	8 (9.8)	6 (8.2)	7 (9.5)
	Nippon Gakki Co., Ltd.	44 (11.9)	35 (15.8)	30 (15.6)	22 (13.6)
con-struction	KAJIMA CORPORATION	2 (7.2)	6 (12.9)	6 (12.3)	12 (13.1)
	TAISEI CORPORATION	15 (6.1)	18 (12.8)	16 (12.2)	15 (12.2)
	SHIMIZU CONSTRUCTION CO., LTD.	8 (6.2)	7 (9.0)	6 (9.5)	7 (10.2)
	OHYASHI CORPORATION	7 (5.1)	13 (10.0)	11 (9.8)	12 (10.0)
inter-national trade	Mitsubishi Corporation	41 (7.8)	43 (9.7)	38 (9.7)	35 (8.8)
	MITSUI & CO., LTD.	36 (9.4)	37 (10.7)	35 (9.9)	34 (8.9)
	Marubeni Corporation	41 (7.5)	33 (7.8)	29 (7.7)	25 (7.4)
	C. ITOH & CO., LTD.	42 (6.5)	33 (7.3)	26 (7.6)	25 (7.5)
retail	ITO-YOKADO CO., LTD.	- -	52 (5.7)	45 (12.5)	38 (12.3)
	Mitsukoshi, Ltd.	50 (10.0)	51 (13.7)	42 (13.0)	38 (11.3)
	JUSCO CO., LTD.	- -	58 (6.2)	51 (7.8)	49 (9.9)
finance	The Dai-ichi Kangyo Bank, Ltd.	48 (9.0)	46 (22.2)	43 (21.6)	36 (18.6)
	The Nomura Securities Co., Ltd.	44 (5.9)	56 (9.3)	44 (8.0)	43 (9.0)
	The Tokio Marine and Fire Insurance Co., Ltd.	38 (3.4)	49 (4.7)	56 (6.5)	36 (11.1)
	Orient Finance Co., Ltd.	- -	- -	41 (2.2)	50 (7.0)
	Nippon Shinpan Co., Ltd.	- -	53 (1.3)	61 (2.4)	66 (5.5)
	JACCS CO., LTD.	- -	- -	45 (1.9)	49 (3.0)

Table 2 - continued

		% (thousand)			
		1968	1974	1980	1986 (or 1985)
real estate	Mitsubishi Estate Company, Limited	26 (2.0)	22 (1.9)	17 (1.8)	15 (1.8)
	TOKYU LAND CORPORATION	25 (0.8)	23 (1.2)	21 (1.4)	21 (0.9)
railways	TOBU RAILWAY CO., LTD.	18 (16.9)	11 (14.9)	6 (12.3)	6 (11.1)
	Nishi-Nippon Railroad Co., Ltd.	14 (16.6)	7 (12.4)	8 (12.0)	7 (10.9)
land trans- portation	Nippon Express Co., Ltd.	12 (74.0)	13 (71.0)	11 (60.0)	9 (48.0)
	SANKYU INC.	13 (8.4)	12 (13.9)	11 (12.2)	11 (11.6)
	YAMATO TRANSPORT CO., LTD.	- -	4 (5.6)	7 (6.0)	18 (19.4)
marine trans- portation	Nippon Yusen Kabushiki Kaisha	6 (5.1)	9 (4.6)	11 (3.4)	17 (2.9)
	Mitsui O.S.K. Lines, Ltd.	5 (5.8)	8 (4.8)	9 (3.6)	13 (3.1)
airways	JAPAN AIR LINES COMPANY, LTD.	- -	33 (13.4)	39 (16.1)	17 (10.1)
	ALL NIPPON AIRWAYS CO., LTD.	- -	28 (7.4)	39 (9.0)	38 (9.4)
	KOKUSAI KOGYO CO., LTD.	- -	14 (1.0)	10 (0.8)	11 (0.9)
ware- housing	Mitsubishi Warehouse & Trans- portation Co., Ltd.	23 (1.3)	24 (1.4)	27 (1.3)	26 (1.4)
	THE MITSUI WAREHOUSE CO., LTD.	25 (1.3)	26 (1.4)	23 (1.1)	20 (1.0)
	Yokkaichi Warehouse Co., Ltd.	22 (1.5)	19 (1.6)	16 (1.4)	17 (1.3)
communi- cations	TOKYO BROADCASTING SYSTEM, INC.	11 (1.5)	9 (1.5)	9 (1.5)	11 (1.5)
	KOKUSAI DENSHIN DENWA CO., LTD.	- -	22 (5.4)	23 (6.0)	26 (6.7)
	Nippon Television Network Corp.	16 (1.4)	13 (1.3)	12 (1.2)	13 (1.2)
electric power	The Tokyo Electric Power Company, Inc.	8 (34.3)	9 (14.3)	11 (15.4)	11 (15.1)
	The Kansai Electric Power Company, Inc.	6 (22.4)	7 (22.3)	8 (23.7)	7 (24.5)
	Chubu Electric Power Company, Inc.	8 (19.2)	7 (17.9)	8 (18.7)	8 (19.6)
gas	TOKYO GAS CO., LTD.	6 (10.0)	7 (12.3)	8 (13.1)	7 (12.9)
	OSAKA GAS CO., LTD.	10 (7.2)	11 (7.6) (1973)	11 (11.2)	11 (10.1)
	TOHO GAS CO., LTD.	12 (2.5)	15 (2.8)	15 (3.6)	18 (3.5)
service	FUJITA TOURIST ENTER- PRISES CO., LTD.	45 (2.1)	31 (2.7)	28 (2.5)	29 (2.5)
	Kinki Nippon Tourist Co., Ltd.	- -	20 (4.2) (1975)	17 (4.7)	19 (5.0)

Source: Company financial reports.

$$\text{female ratio} = \frac{\text{female regular employees}}{\text{total regular employees}} \times 100$$

() shows number of total employees.

there are firms that still show declining ratios. Such firms are in international trade, department stores, supermarkets, banks, securities, and insurance.

(3) There are some growing firms with rising female ratio. These ratios are related to changes in their activities. Yamato Transport Co. grew with newly developed courier service and resulted in an increase in female employees. Nippon Shinpan Co., All Nippon Airways Co., and Kokusai Denshin Denwa Co. are also in the same category.

(4) Marine transportation such as Nippon Yusen K.K. and Mitsui O.S.K. Lines shows rising ratio. This is because of unexpectedly great decreases in marine staff.

(5) A very few cases show a decrease in female ratio with a growing number of employees: Yamazaki Baking Co., Canon Inc., and Minolta Camera Co. are such exceptions.

In short, female employees tend to increase in firms with rapid growth of employees. But, once they reach the peak, females are more likely to decrease, partly because the quit rate is higher for females and encourages natural wastage.

3. Females in Banking Firms

Banking is one of the targets of office automation. Banks are not usually easy to access information. Here I would like to refer to Yamakoshi's careful-researched work (6) published recently.

Table 3 Trends in Employees of Banking Firms

	Total employees					Female employees				
	city banks	local banks	trust banks	long-term financing banks	mutual financing banks	city banks	local banks	trust banks	long-term financing banks	mutual financing banks
1970	160,941	116,339	25,513	6,445	74,164	71,619 (44.5)	43,162 (37.1)	11,966 (46.9)	3,094 (48.0)	22,768 (30.7)
1971	167,012	122,496	26,813	6,785	77,232	76,491	48,753	13,326	3,393	25,332
1972	176,168	131,426	28,413	7,364	80,236	82,270	53,885	14,434	3,807	27,441
1973	181,424	137,729	29,900	7,737	81,862	84,181	57,984	15,309	4,054	28,652
1974	186,933	145,409	31,393	8,287	87,108	86,363	62,671	16,293	4,434	31,620
1975	<u>192,606</u>	152,374	33,079	8,752	91,800	<u>87,947</u> (46.7)	66,892	17,466	4,752	33,415
1976	190,683	155,293	<u>33,212</u>	8,709	92,715	89,240	68,795	<u>17,536</u> (52.8)	4,903	33,656
1977	188,416	160,660	33,106	8,843	93,282	86,483	71,494	17,348	4,890	34,048
1978	187,664	164,012	32,636	8,966	93,829	85,762	73,313	16,840	4,904	34,248
1979	184,200	164,805	31,415	8,975	93,209	82,522	73,173	15,676	4,802	33,648
1980	181,190	167,319	30,479	8,951	93,901	79,905	74,290	14,752	4,735	33,804
1981	179,311	<u>170,285</u>	30,068	9,228	94,923	78,359	<u>75,777</u>	14,252	4,882	34,267
1982	176,396	169,854	29,934	<u>9,562</u>	<u>95,338</u>	75,647 (42.9)	74,906 (44.1)	14,039 (46.9)	<u>5,068</u> (53.0)	<u>34,322</u> (36.0)
75~82	-16,210	17,480	-3,145	810	3,538	-14,273	8,014	-3,427	316	907

(1) Peak figures over the 1970-82 period are underlined.

(2) () shows female ratio.

Source: *Ginko rodô chosa jihô* (Review of banking labour survey), No. 410, from Yamakoshi [6] p. 157.

Banks belong to a growing sector in terms of output and income, but not always terms of employment because of rising productivity. Japanese banks are divided into five different kinds of institutions: city banks, local banks, trust banks, long-term financing banks, and mutual financing banks.

Table 3 shows changes in number of employees by the kind of bank during the period of 1970–82. The largest numbers of employees are at city banks and local banks. Then mutual financing banks, trust banks, and long-term financing banks follow in this order.

The right half of Table 3 tells another story. The female ratio grows as number of female employees increases, and declines as it decreases. The problem is that the speed of decline is not the same as that of growth.

The female ratio in local banks grew from 37.1% in 1970 to 44.5% in 1982, and that in mutual financing banks grew from 30.7% in 1970 to 36.0% in 1982. On the other hand, female ratio in city banks declined from 46.7% in 1975 to 42.9% in 1982, and that in trust banks declined from 52.8% in 1976 to 46.9% in 1982.

The underlined figures are those of the highest number of employees. The total number of employees peaked in 1975 for city banks, in 1981 for local banks, in 1976 for trust banks, and is still increasing for both long-term and mutual financing banks. This means nothing about the number of employees is common to all kinds of banks.

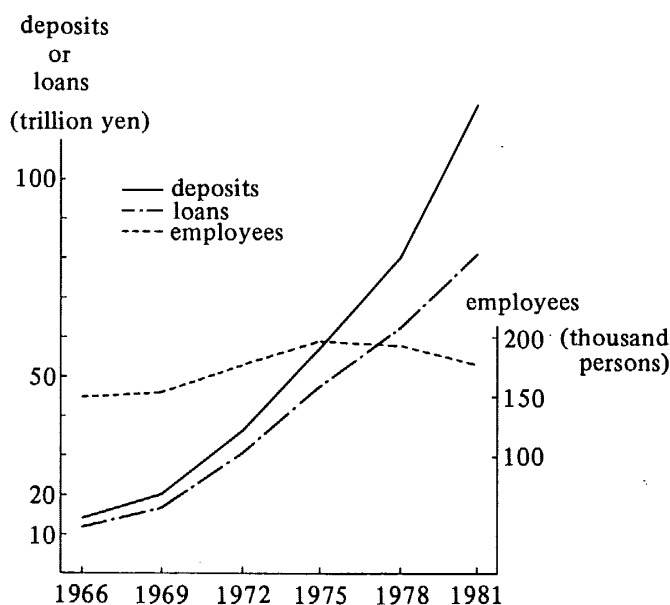
The right half of Table 3 shows the case of female employees. The underlined figures also show the peak number of employees, and the female ratios are shown in parentheses.

It is interesting to note that female peak years exactly coincided with peak years for total employees. I stated in the previous section that the number of female employees increases more when that of the total increases. Table 3 supports this.

Let us examine more closely changes within city banks and trust banks. In city banks, 42.9% in 1982 meant 75,647 women; and the ratio was lower than 44.5% in 1970, which was 71,619 women. 46.9% in trust banks, 46.9% meant 14,039; the ratio was just same as that in 1970 but the number had grown from 11,966. The experience of the two institutions means that the decrease in women was faster than the increase. This is not reversible.

Some data based on Yamagoshi's paper are available for city banks. Turnover rose remarkably. Figure 1

Figure 1



Source: National Association of Banks, *Zaimushohyo bunseki* (analysis of financial affairs), from Yamagoshi [6] p.156.

shows growth of deposit and loans in terms of yen in the 1966–81 period. The number of employees gradually increased but decreased after 1975. Deposit per employee rose by 120% during the late six years with reasonably stable prices.

One of the city banks was further examined by Yamakoshi. He pointed out that the first wave of on-line automation aimed at excluding repetitive and boring work of banking and that the second aimed at cutting overtime work and reduced hiring.

He also pointed out that generally city banks had such policies as separating software business, and subcontracting key-punching and computer operation. This trend will continue in the future as well.

Temporary work service is a growing area, needless to say. Most female workers are engaged in office-related jobs using electronic machines such as word processors, and other OA machines. Large firms tend to replace full-time female office workers with such temporary work service, but it should not be exaggerated. According to one estimate, the number of female office temporary help in Japan was only 1% of total female employees in 1985 (3, p. 28). Replacement tended to be occurred between female office workers and electronic machines rather than between women and men

4. Home Working System

In 1986 only 40 firms have home working employees in Japan. They were related to sales personnels, stenography, and OA machines such as word processors and personal computers. Most of them were housewives of in their 30s. According to a survey (3), 35.5% of female temporary help workers wanted to work at home in this way. A local firm had thirty applicants for each position when it recruited people for home working. Present problems for workers are fluctuations in workload and workers' health without any official control.

Among a very few studies of home working, Suwa (4) made an intensive (case) survey of six firms in Tokyo. The reasons for introducing home working system for firms were: (1) electronic machines required twice the office space per employee as before, (2) home working system can smooth fluctuation of business, (3) persons (equipped) with word processing skill are so scarce that they are expected to work until the age of even 70 or so, (4) labor cost is lower than that for regular employees, (5) women with work experience can work at home and can return to an office before their skills become obsolete, and (6) home working saves cost of commuting.

Home working system benefit such people as women, the aged, and the handicapped. The potential labour supply should be reasonably large. But the actual situation seems to lag far behind. The necessary conditions for firms to introduce this system is shortage of workforce. The second condition should be that a work can be done by an individual basis. Teamwork is most difficult to adapt to the home working system. Some professional work is very proper for it. The fundamental condition is the availability of electronic machines: greater capability and lower prices ease home working system further.

Apart from orthodox home-work, satellite office system have attracted attention

recently. Satellite offices developed in the U.S.A. and some examples were reported to a meeting of the Office Technology Research Group in the fall of 1981 (5). The most common cases were professional or technical workers using a portable microcomputer at home. Continental Illinois National Bank was probably the first to establish a word processing satellite.

Remote site working is especially interesting both to firms and workers. NEC facing a shortage of software engineers, in 1983 started ordinary home working system for female engineers using microcomputers at home. Major complaints at that time were isolation from colleagues and a difficulty of changes in mind between private life and work. Then NEC established satellite offices which are now welcomed by the workers, mainly because they are free from notorious commuting trouble in Tokyo. Now it has 20 offices around Tokyo.

Suwa pointed to another reason for success in remote site working in Japan (4). The Japanese put emphasis on teamwork instead of individual work. Typical office layout is to pool many staff in a large area and to avoid individual space. This is also true for management people. A new intelligent office of Honda Motor Company in Aoyama, Tokyo has a large hall for all the directors together.

The work in satellite offices of NEC is rather close to that in regular offices. One manager and ten software engineers are all regular employees engaging in software development using microcomputers. They already had four or five years of service. Salaries and working hours are just the same as the main office, and one day a week to attend a meeting at the main office. Personnel management is done by remote control of the main office.

Complaints there were (1) difficulty of communication with colleagues with the same job at the same workplace, (2) fear of lack of information and obsolescence of their own skill, (3) workers' fear to be ignored by their colleagues in the case where they commit strongly to the main office, and (4) human relations with the people at their original places which sometimes become not so smooth as before.

In short, some teamwork jobs are not suitable to small satellite offices. On the other hand the office cost per employee is estimated to be as low as 60–70% of that in the main office.

Concluding Remarks

Compared with the period before the oil crisis, female employment was more induced than male employment by economic growth, although this economic growth rate was itself lower after the oil crisis. But the core of large leading firms was still occupied by male workers, and this tendency seems to be strengthened. More than a half of 68 large firms examined had a decrease in the female ratio, contrary to our expectations. Experiences in banking firms show a close relationship between introduction of new electronic equipment and a decrease in the female ratio. The female ratio rose with an increase in the number of employees at banks, and declined with a decrease, but the speed was faster in declining stage than in rising stage (with relation to changes in employees).

Home working system is quite new in Japan. So far this has only been introduced only because of a shortage of software engineers. Remote site working seems to be growing more than home working itself, because teamwork, popular at Japanese firms, can still flourish at such satellite offices.

"General" ability is more fostered at Japanese schools, and it is more highly appreciated in Japanese firms. The educational level of the female workforce is fairly high. Both of these are favorable to technological changes at any time. But women are much fewer than men in important positions of Japanese firms, and they have less training opportunities than males. It should be noted that innovation required high-level and comprehensive ability, but that, once introduced, reasonably educated workforce can follow it. It has usually been found in the past that new technology seems to be essentially a de-skilling process: new technology makes previous skills redundant and reduces the status of the job to which it is applied.

In addition to the concluding remarks, I would like to present a result of recent research into work satisfaction of women doing both regular and part-time work. Eight items were investigated: job content, working hours, off-work days, wages, commuting time, human relations in the work place, status in the work place, and the total working life. Satisfaction was especially low for wages, but others were rather balanced. A striking finding was that part-time workers showed a higher level of satisfaction for each of these items than did regular workers. The sample was drawn from female workers in general and not especially related to office jobs. (3, p. 77) It seems to me that even the micro-electronic technology would not change the situation.

The Equal Employment Opportunity Law for Men and Women became effective in April 1986. Judging from the content of the Law, it will give some impact on higher-educated graduates in terms of their career development as regular employees. The problem is that the percentage belonging to this category, though increasing, is still small.

On the contrary, the Law will have no impact on part-time workers, regular female employees already in small firms, and young women informally on short-term contracts at large firms.

Today, Japanese women are not unhappy. They can choose any of a number of lifestyles: careered women (total dedication to a company), part-time workers, re-entry to labour markets, or just housewives. They will have more job opportunities than men, but wide wage differentials between men and women are another problem to be solved in the near future.

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