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GENERAL SURVEY

People Find Themselves Unemployed for Increasingly Longer Periods: *Labour Force Survey*

On May 30, the Ministry of Public Management, Home Affairs, Posts and Telecommunications published the results of the January to March *Labour Force Survey* (provisional reports). The number of unemployed people increased by 30,000 from the same period a year earlier to 3.63 million, and the number of those who had been unemployed for one year or longer increased by 90,000 to 1.12 million. The results confirm that while the number of unemployed appears to have peaked, the period that people are unemployed continues to lengthen.

Of the 3.63 million jobless people, 34.7 percent (a drop of 1.6 percentage points from the same period a year earlier) were unemployed for less than three months; 16.4 percent (an increase of 0.5 percentage point) for three to six months; 17.8 percent (an increase of 0.4 percentage point) for six to 12 months; and 31.1 percent (an increase of 0.7 percentage point) for one year or longer. Looking at the long-term (one year or longer) unemployed more closely, 15 percent (an increase of 0.3 percentage point) were out of a job for one year or more

but less than two years, whereas 16.1 percent (an increase of 0.5 percentage point) were unemployed for two years or longer, showing a gradual tendency of an increase in the proportion of workers trapped in long-term unemployment. The annual average results of the 2002 *Labour Force Survey* highlight different aspects of long-term unemployment. For example, the proportion of people jobless for one year or longer was higher among middle-aged and older people than among the younger age groups: some 30 percent of those 35 years and older, and 50 percent among those aged 65 and above.

The highest percentage, 30.2 percent, said the reason they did not have a job was because the type and nature of the job they were looking for was not available, followed by “my age is not within the age requirements noted in job advertisements” (23%). Compared to the results for the same period in the previous year, the proportion of those giving the above two reasons increased by 4.3 percentage points, whereas the proportion of those who answered “there are no jobs satisfying my wage and salary expectation” fell by 1.7 points to 6.9 percent. More than 30 percent of workers under 45 years old replied that there were no jobs of the type and nature they were looking for, the highest percentage. On the

other hand, among jobless middle-aged and older people (45 and over), the proportion of those saying that they were not qualified to answer job advertisements because of age requirements accounted for more than 40 percent.

The survey results confirm that middle-aged and older workers are unemployed for longer periods of time, with age requirements being a particular hindrance to re-employment. According to Public Employment Security Office statistics, the revised Employment Measures Law implemented in October 2001 (see the November 2001 issue of the *Japan Labor Bulletin*) helped increase the proportion of job advertisements that do not carry age requirements to 16.6 percent in April 2002. But this was reversed by November 2002 when the figure stood at 12.8 percent. The Ministry of Health, Labour and Welfare has launched a policy to relax age requirements, so that the proportion of job openings without such requirements will hopefully increase to 30 percent by 2005.

HUMAN RESOURCE MANAGEMENT

Researchers Receive Inadequate Treatment

The *Annual Report on the Promotion of Science and Technology 2003* analyzes in detail for the first time the situation affecting researchers and others in the fields of

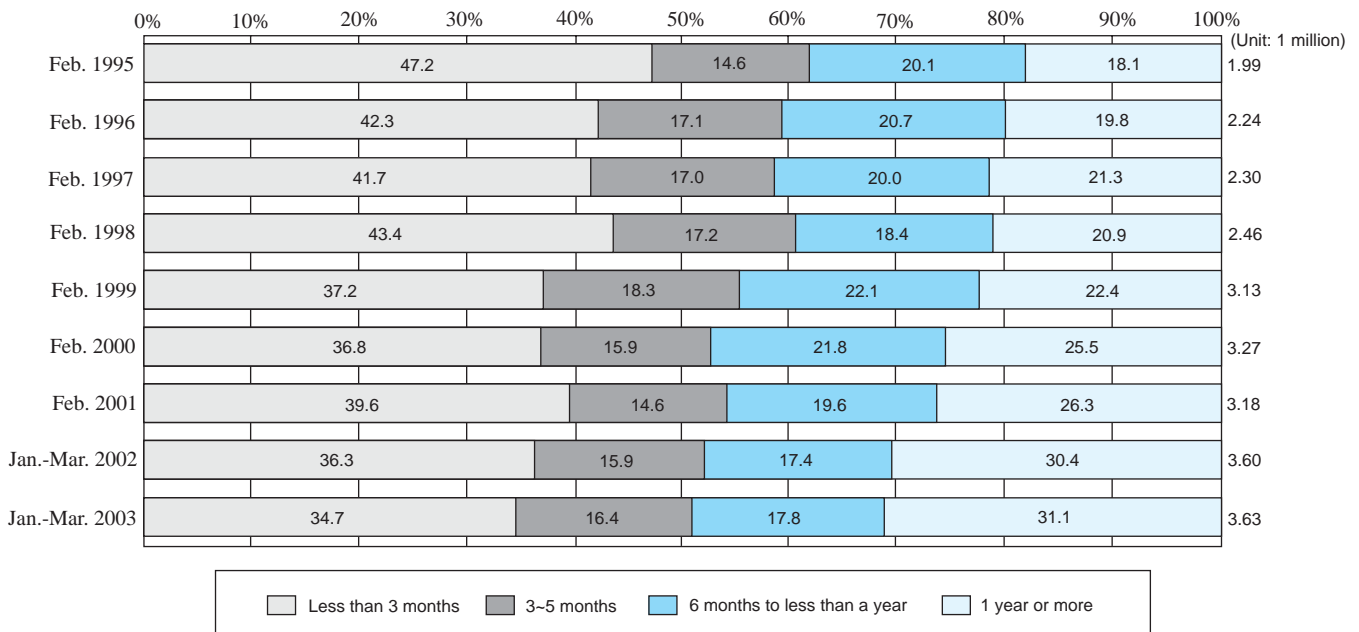
science and technology. Presented to the cabinet on June 6, the *White Paper* states that, with global competition intensifying since the 1990s, the lack of manpower in such research fields as life science, information technology, nano-technology and the environment remains unsolved, and emphasizes that researchers receive inadequate treatment, pointing to the importance of appropriate treatment in relation to their achievements.

The highest proportion of researchers in Japan, 63.7 percent, work for private firms, followed by universities and other academic institutions (29.6%), governmental research institutes (5%), and private research institutes (1.7%). In the last five years, the number attached to private firms increased from 400,000 to 430,000; an industry break down shows that 27.7 percent were in telecommunications, 9.3 percent in electronic and electrical gauging industry, electrical machinery and equipment, 8.9 percent in the automobile industry, 8.8 percent in chemicals, 8.5 percent in machine industry, 4.8 percent in precision machinery, 4.6 percent in medical industry, and 3.3 percent in computer software.

Comparisons between Japan and the United States regarding the average wages in individual industries showed that the average wage for engineers in the U.S. was 1.65 times higher than the salary for general office workers, and that research workers earned 2.13 times that for general office workers, whereas the figures for Japan are 1.11 times and 1.18 times, respectively. In a

Statistical Aspect

Percentage of Unemployed by Duration



Source: Ministry of Health, Labour and Welfare, *Labour Force Survey*, 2003.

survey directed at private firms engaged in research and development, 65 percent of the firms surveyed answered that there was no difference in average wages between researchers and workers in charge of other duties, which suggests that some firms hardly differentiate between their researchers and their ordinary employees in terms of wage and treatment; this seems a likely factor deterring talented personnel from engaging in jobs related to science and technology.

On the other hand, according to a survey of 2,000 researchers who had presented major academic papers in the previous two years, 41 percent answered that they were content with their salaries, whereas only 36 percent said they were not. At the same time, asked about the amount of research funds, and special allowances for the products of their research, 53 percent and 60 percent, respectively, felt dissatisfied. Thus, the annual report emphasizes that while researchers did not appear to be especially dissatisfied with their wages at the moment, in order to allow them to demonstrate their full ability and to encourage more people to enter the field of research, it is necessary to establish a system which evaluates the achievements of researchers in a fair manner and reflects the fruits of their labor in wages and treatment.

It is said that the labor market for researchers is less flexible in Japan than in Western countries. More than half, 52 percent, of the researchers surveyed had only changed jobs once. Among those who switched affiliation twice or more, it appears that the more one changed jobs, the more dissatisfied they were with their current salaries, fringe-benefits and other treatment. The report concludes that taking into account the need to impart a

broader worldview and with the progressive globalization of science and technology, it is desirable to construct a social system in which labor turnover does not result in disadvantages in terms of retirement allowances and pension benefits.

PUBLIC POLICY

Revised Worker Dispatching Law Passed

On June 6, the revised Worker Dispatching Law and Employment Security Law were passed. The revised Worker Dispatching Law relaxes the restrictions on the length of time a worker can be dispatched and the types of jobs dispatched workers can engage in, while the Employment Security Law grants local public bodies the right to conduct job placement services for free. More specifically, workers can now be dispatched to manufacturing sites and the maximum period has been extended from one to three years. In addition, guidelines have been incorporated to encourage the transfer of dispatched workers to regular employee status.

The Worker Dispatching Law first came into being in 1985, and its purpose was to prevent the erosion of regular employment. Initially only 13 jobs were listed in the law, those which required highly specialized skills, like software development, and particular types of employment management. The law has twice been revised, increasing the number of dispatchable types of work to 26.* In 1999, however, it was fundamentally revised so that the general restriction on the types of work which dispatched workers could undertake was lifted and

Statistical Aspect

Recent Labor Economy Indices

	May 2003	June 2003	Change from previous year (June)
Labor force	6,735 (10 thousand)	6,771 (10 thousand)	30 (10 thousand)
Employed ⁽¹⁾	6,360	6,411	38
Employees ⁽¹⁾	5,351	5,373	25
Unemployed ⁽¹⁾	375	361	-7
Unemployment rate ⁽¹⁾	5.4%	5.3%	-0.1
Active opening rate ⁽¹⁾	0.61	0.61	0.08
Total hours worked ⁽²⁾	151.5 (hours)	158.3 (hours)*	1.4 (%)
Monthly cash earnings ⁽²⁾	282.4 (¥ thousand)	478.4 (¥ thousand)*	1.7 (%)

Notes: ⁽¹⁾ Seasonally-adjusted figures.

⁽²⁾ Figures refer to establishments employing five or more people.

*Preliminary figures.

US\$1= ¥120 (August 1, 2003)

Source: Ministry of Public Management, Home Affairs, Posts and Telecommunications, *Rodoryoku Chosa* (Labour Force Survey); Ministry of Health, Labour and Welfare, *Shokugyo Antei Gyomu Tokei* (Report on Employment Service), *Maitsuki Kinro Tokei* (Monthly Labour Survey).

replaced by a “negative list” system whereby the only listed activities were prohibited. The revision, essentially, posed no restrictions, and dispatched workers have been able to engage in all work except those associated with harbor transportation duties, construction, security guards, medical-related duties, and duties related to manufacturing. The substantial relaxation of the restriction was responsible for the rapid increase in the number of dispatched workers from 580,000 in 1994 to 1.07 million in 1999, and again to 1.75 million in 2001. (If the number of such workers is calculated in terms of regular employees, the figures would be 240,000 in 1994 and 610,000 in 2001.) The sales of worker dispatching companies totalled ¥1.94 trillion in fiscal 2001, a substantial increase of 16.4 percent over the previous fiscal year.

With more workers being dispatched, the latest revision was enacted in accordance with the final proposals from the Council for Comprehensive Reform of Regulations. While the upper limit of the dispatch period was expanded to three years, the revision ruled, for the purpose of protecting workers, that client firms must fix the contract period in advance when it exceeds one year, and that the business in question must consult the opinion of its company labor union or any other workers’ group representing more than half of its employees. At

the same time, dispatching companies must give notice of the termination of dispatch to client companies and dispatched workers prior to the day before the period reaches its upper limit. And if the client company wishes to continue hiring the worker in question, it must offer the worker a direct labor contract. Concerning the 26 types of work described below, workers have been dispatched for up to three years (not by law but by an official notice), but now, under the latest revision, the maximum limit has been abolished. However, when a company making use of the same dispatched worker for more than three years wishes to hire a regular employee (rather than the dispatched worker) for the duties hitherto conducted by the dispatched worker, it must first approach the dispatched worker. The possibility that abolishing the three-year maximum for the 26 types of work may lead to endless use of the same dispatched workers is not addressed in the revision, but is expected to be discussed in the future. Concerning dispatching workers for manufacturing duties, which is no longer prohibited, the period is limited to one year during the first three years of implementation of the revised law. As for the “temp-to-perm” arrangement whereby temporarily dispatched workers can stay on as permanent regular employees of the client company after termination of the temporary contract, the revised law has removed the ban on interviews prior to hiring, and the direct employment of such workers while the temporary dispatching contract is still in force.

While some praise the revised law because it will increase the choice of working styles and expand employment, Rengo (Japanese Trade Union Confederation) and other labor unions object that the extension of the dispatchable period will not lead to employment stability, but will encourage labor shedding, since the revision facilitates the substitution of regular employees with dispatched workers. In Diet proceedings, opposition parties called for amendments to the proposal submitted by the government, claiming that it did not do enough to protect workers, but the three ruling parties were able to gather enough votes to pass the revision. The revised law is expected to come into effect in March 2004.

***26 Types of Dispatchable Jobs**

1	Software development
2	Machinery design
3	Operation of broadcasting, equipment, etc.
4	Broadcast program director, etc.
5	Office equipment operator
6	Interpreter, translator or stenographer
7	Secretary
8	General clerical, including filing
9	Investigation
10	Financial processing
11	Preparation of transaction documents
12	Product demonstration
13	Tour guide
14	Janitorial services
15	Operation, inspection and adjustment of construction equipment
16	Guide, receptionist, parking area attendant, etc.
17	Research and development
18	Planning and advising regarding operating systems
19	Production and editing of books
20	Advertising design
21	Interior coordinator
22	Radio/television announcer
23	Office automation instruction
24	Telemarketing
25	Marketing by so-called sales engineers
26	Preparation of scenery and other items for television broadcasting, etc.

**Number of Children Continues to Decrease:
Measures to Support Child-rearing**

According to the 2002 *Vital Statistics of Japan* compiled by the Ministry of Health, Labour and Welfare, the total fertility rate, i.e. the number of children a female will give birth to in her lifetime, was 1.32, lower than the lowest record of 1.33 marked the previous year. The birth rate among the second generation of baby boomers born around 1973 is peaking, so that even fewer children are expected to be born from now on. To reverse this situation, the government is making efforts to bring about

conditions that would encourage a balance between work and family.

The drop in the overall fertility rate is due to the increase in the number of females who stay single or defer marriage. For example, in the 1960s and 1970s, most females married around the age of 24; that figure had increased to 27.4 by 2002. The decrease in the number of live births is attributable to an increase in direct expenses for education and other costs involved in child-rearing, together with the difficulty in reconciling a working life with giving birth, child-raising, and other aspects of family life.

A Ministry of Health, Labour and Welfare survey, conducted in January and February 2002, of 2,000 households (replies were returned by 1,765 households, an 88.3% rate of return) highlighted the fact that fathers are required to pay more attention to work rather than child-rearing. When their first child was born, 29 percent of fathers wished to reduce their working hours, but a mere 6.5 percent actually managed to do so. At the same time, 68.9 percent of all fathers wanted to place priority on child-raising as much as or more than on work, but again those who answered that they were able to do so accounted for a mere 33.6 percent. Asked to cite three major problems in working while raising children, the highest proportion, 39.2 percent, said that they could not spend enough time taking care of their children; followed by too much overtime and it is difficult to take days off (32.9%); it is difficult to reconcile work with household chores and child-care (25.2%); and it is impossible to respond to urgent tasks flexibly (14.1%). As a whole, many males see long working hours and a lack of flexibility as major problems.

To stem the decline in the number of children, the government submitted a bill promoting ways to support child-care for the next generation, which came into effect on July 9. The law attempts to realize targets for childcare leaves for parents (10% for males and 80% for females) set forth by the Ministry of Health, Labour and Welfare last year. It will oblige local public bodies and private firms with 300 or more employees to draw up specific plans to support their employees in balancing work and family lives. (As for small and medium-sized private firms with less than 300 employees, the law stipulates that they have “a duty to endeavor” to try and devise such plans.) In line with this, firms are expected to form practical plans based on guidelines to be subsequently drawn up by the ministry, and to implement the plans from fiscal 2005. The ministry’s draft of the guidelines provides as many specific target figures as possible, and requires firms to realize their planned target for childcare leaves within two to five years. A particular focus is to encourage fathers to take such leave which will require firms to formulate tangible measures such as, for example, the creation of a system of leave following childbirth.

Employment Measures for Youth

A Ministry of Health, Labour and Welfare survey states that of the high school students who graduated this past spring who were hoping to get a job, 90 percent were actually promised a job by the end of March, a marginal increase over the same period of the previous year. At the same time, however, the number of high school graduates who had searched for a job until immediately before graduation but failed to find one totalled 17,850. In addition, it is believed that a considerable number of graduates gave up job searching due to the gloomy labor market outlook. The unemployment rate among young people too has remained high in recent years, with an additional estimated two million or more so-called *freeters* who work not on a regular basis but on part-time or *arubaito* (side job) basis.

It has been traditional for young Japanese to start working as regular employees immediately after school graduation. Recently, however, the number of job openings for such young workers has been decreasing, while their sense of value concerning work has been changing, so that the traditional pattern of “transition from school to workplace” is being undermined. Despite this, Japanese society has failed to offer any career paths apart from such direct transition. Thus, it is difficult for young people who have stepped out of track to reorganize their own vocational careers.

To deal with such employment problems among young people, the Council to Encourage Self-Support, Determination, and Resourcefulness among Young People — set up by cabinet ministers from the Ministry of Health, Labour and Welfare, the Cabinet Office, the Ministry of Economy, Trade and Industry, and the Ministry of Education, Culture, Sports, Science and Technology — has drawn up and published a “Plan to Encourage Self-Reliance and Determination among Young People.”

The plan’s aim is to turn around the trend towards a steady increase in unemployed young people and *freeters*. Its essence is a Japanese model of the “dual system” in Germany, which is to provide vocational training courses, for example, internships at actual workplaces three days a week and classes two days a week. By combining the advantages of learning opportunities at both the workplace and school, the plan seeks to encourage young people to learn to become true “professionals.”

Apart from this, the plan incorporates a wide range of measures, including the promotion of career education and work experience at an earlier stage; training and allocation of career consultants specializing in young job seekers; one-on-one help in job searching by “job supporters” (job-searching counselors); and comprehensive counselling and provision of information through local “one-stop centers” for young job seekers.

Globalization of Production Activities, Changes in Production Technology, Technological Innovation and Employment

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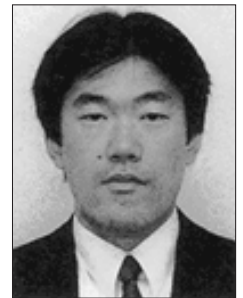
1. Introduction

Concern that the Japanese manufacturing sector may have lost its international competitiveness has become a subject of frequent debate. The *2001 White Paper on International Trade* by the Ministry of Economy, Trade and Industry (METI), for example, notes that a drop in the rate of new business start-ups is generating a tendency for the manufacturing sector to shrink. In 1999, the rate of new business start ups stood at 1.9 percent and that of business closures at 5.3 percent. The figures for 1989 were 4.5 percent and 3.0 percent, respectively. In 1999, the number of business establishments in the sector was 690,000 (down 168,000 compared to 1991) and the number of employees was 11.45 million (a drop of 2.635 million during the same period) according to the “Establishment and Enterprise Censuses of the Statistics Bureau” by the Ministry of Public Management, Home Affairs, Posts and Telecommunications. The *White Paper* also notes that the shrinkage of the manufacturing sector leads to concerns over the ability to secure skilled engineers and transfer skills, and that as Japanese business infrastructure loses its place of superiority, Japan’s competitiveness in the international market will decrease.

The *2002 White Paper on the Economy and Public Finance* discusses structural reform, economic vitalization and other issues, focusing on the hollowing out of Japanese manufacturing, particularly in relation to the development of the Chinese economy.

In line with this, METI, the Ministry of Health, Labour and Welfare, and the Ministry of Education, Culture, Sports, Science and Technology released the *2003 White Paper on Manufacturing Infrastructure*. This *White Paper* was drawn up on the basis of the Basic Law on Promotion of Manufacturing Technology which came into effect in June 1999. The paper for this fiscal year points out that the manufacturing sector still holds a significant position in the economy, its added value accounting for some 30 percent of the nation’s GDP, and that, with the present gloomy state, corporate investment in research and development is seeing sluggish growth, expanding the gap between it and its U.S. counterparts.

The paper also suggests that Japanese manufacturing companies should increase their corporate investment in research and development in order to revive their international competitiveness. At the same time, the *White Paper* proposes that Japan, China and Southeast Asian countries should construct a complementary relationship in their economic development, taking advantage of each other’s characteristics — for example, Japan should make use of its advanced technological level, and China and Southeast Asia of their relatively inexpensive labor costs. The *White Paper* also discusses workers in the manufacturing sector in terms of hiring and unemployment, and human resource development, introducing actual cases showing how human resources for production are trained in research and development institutes and schools.



This article discusses the findings of a questionnaire targeting the manufacturing sector which was carried out last year from the same viewpoint as the *White Paper on Manufacturing Infrastructure*⁽¹⁾. The questionnaire shows that Japanese manufacturing companies are facing various obstacles, including intense competition from both domestic and international firms, a prolonged economic recession, and deflation⁽²⁾. This article discusses mainly how manufacturing companies, under such circumstances, view the current situation affecting business management, employment, personnel training, and technological development, and what kind of strategies they have adopted for their survival.

This article is organized as follows: Section 2 reviews the current situation surrounding the manufacturing sector. A particular focus is placed on how intensively Japanese manufacturers are competing with overseas producers and suppliers, and how they evaluate the prices and quality of rival products from abroad. Section 3 discusses the recent management and personnel measures taken to deal with the increase

in imported products and product parts, and the increase in the ratio of production by foreign business partners. Special attention is paid to corporate efforts in passing on skills and ability development. Section 4 examines how individual firms develop original technologies and new methods in production and operations and what affect they have, together with the development of original high value-added products and their affect. This section also sheds light on the current status of the partnership and research and development collaboration between private firms and universities and other academic institutions, and the fruits of such collaboration. Finally, Section 5 systematically sets forth tasks for the future.

2. Situation Surrounding the Manufacturing Sector

This section describes the situation affecting the manufacturing sector, and outlines the intensive competition between Japanese products and imported products and product parts, and how Japanese manufacturing firms evaluate the prices and quality of products from abroad.

2.1 Current Status of Production Activity

Now let us have a closer look at the production activities of individual business establishments. Figure 1 shows the results to questions relevant to the issue. As a whole, affirmative answers tend to be given to questions such as “we possess unique technologies, patent rights,

or products which other firms do not have,” and “we have confidence in our products,” whereas a majority gave negative answers to the item “our technical capacity is diminishing.” The findings demonstrate that the business establishments surveyed have confidence in their own technological capacity, and in the products that reflect such technologies. At the same time, however, a majority of the establishments surveyed are exposed to “severe competition with firms in developing countries” and “severe competition in product prices,” and find it “difficult to cut costs any further.” In particular, a vast majority see their labor costs as high. As a result, although they have so far managed to place priority on job security, they are now obliged to shed their workforce for the sake of the survival of the firms themselves. This is the general picture at production sites as a whole.

2.2 Competition with Imported Products and Product Parts

Let us now examine the competitive relationship between products from Japanese manufacturers, and imported goods. The firms surveyed rated their products in comparison with imported products on a scale of one to four in a competitive relationship, together with “(imported products are) complementary” and “cannot tell.” According to the findings, more than half of the firms surveyed answered that their major products are in competitive relationships with imports: 22.4 percent replied that their products were in competition with

Figure 1. Status of Production Activities (multiple answers, N = 500, unit: %)

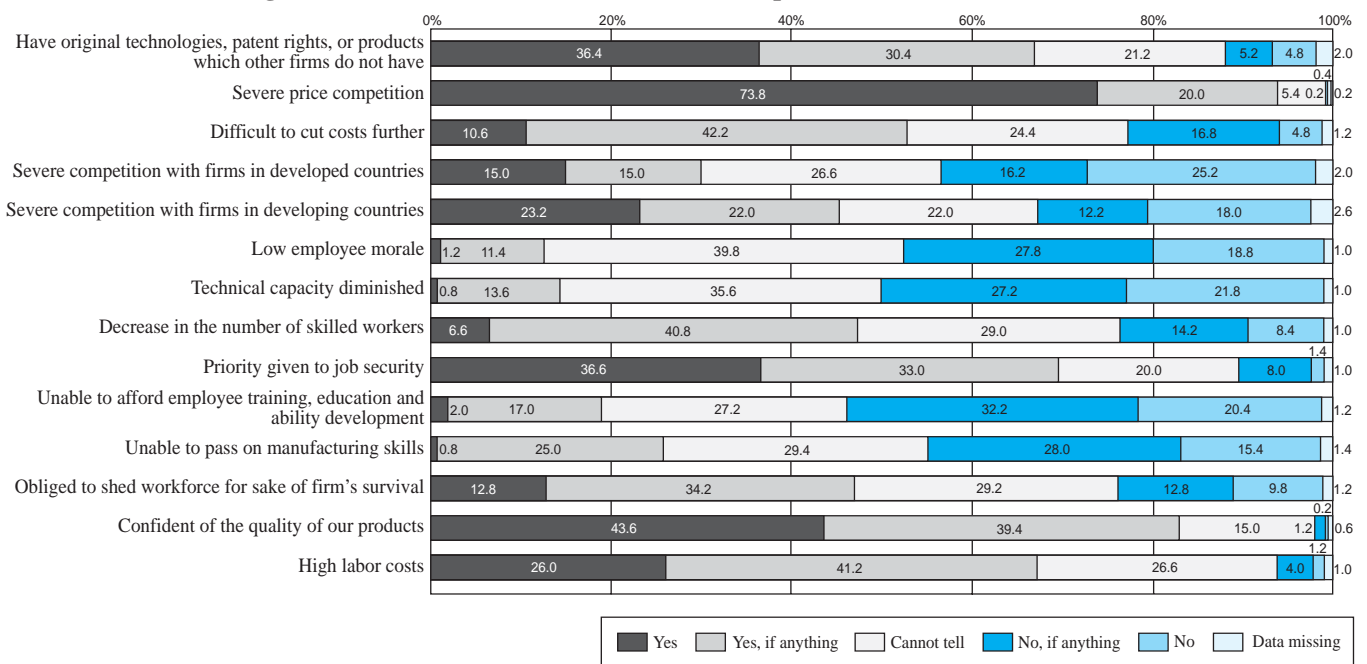


Table 1. Price and Quality of Imported Goods Compared with Japanese Products (price, N = 209; quality, N = 210; unit: %)

	Price of competing products	Quality of competing products
Less than 20	2.4	1.4
20 to less than 40	5.3	2.3
40 to less than 60	19.6	9.5
60 to less than 80	28.7	28.0
80 to less than 100	34.9	42.4
100 or more	9.1	16.2

imported goods; 18 percent that their products were in mild competition; and 10.4 percent that their products were in fierce competition. On the other hand, 38.4 percent of the firms surveyed answered that their products were not in competition with import products.

Where are these imported rival products coming from? Among the countries cited by the firms surveyed, China was given 130 points, South Korea 36, and the U.S. 31. In terms of region of origin, a majority cited Asia.

Concerning price and quality of rival products from abroad (see Table 1), the average price was approximately 71 percent (31.34 of the standard deviation) of the price of the products of the firms surveyed. As for the relative distribution of the prices of rival products, “80 percent or more but less than 100 percent” accounted for the highest proportion, followed by “60 percent or more but less than 80 percent” and “40 percent or more but less than 60 percent.”

The average quality of rival import products stood at some 78 percent (18.96 of the standard deviation) of the quality of products of the firms surveyed. In the distribution of quality, the highest proportion fell in the range of “80 percent or more but less than 100 percent,” followed by “60 percent or more but less than 80 percent.” At the same time, 6.8 percent of the firms answered “100 percent or more,” an interesting result showing that some imported products are of higher quality than their Japanese-made counterparts.

3. Response to Increase of Imported Products, and Increase in Ratio of Production by Foreign Business Partners

The survey questioned the business establishments about the latest steps they had taken in response to the increasing inflow of foreign products and product parts, and the expansion of overseas production by their business partners. Multiple replies were permitted.

3.1 Business Measures and Responses

Concerning business measures and responses

towards the increasing inflow of foreign products and product parts, and the expansion of overseas production by their business partners, the highest proportion, 49.2 percent, selected “innovations in the production process.” This was followed by “reducing distribution costs” (45.9%), “development of new products” (40.8%), “increased overseas procurement of raw materials and parts” (37.5%), “greater emphasis on automatization and energy economies” (35.0%), and “research on and development of new technologies” (30.7%). (See Table 2.)

Table 2. Main Business Measures and Responses to Increase in Imports, and Increase in Production by Foreign Business Partners (multiple answers, N = 488, unit: %)

Innovations in the production process	49.2
Reducing distribution costs	45.9
Development of new products	40.8
Increased overseas procurement of raw materials and parts	37.5
Greater emphasis on automatization and energy economies	35.0
Research on and development of new technologies	30.7
Engagement in TQC and/or TPM activities	28.7
Networking of production and inventory management	27.0
Abridgement or reduction in number of production lines	25.6
Changes in layout of production facilities	25.6
Outsourcing of duties at workplaces	24.8
No longer produce unprofitable products	24.2
Restructure, integration or closure of factories	23.4
Marketing of new customers and development of sales channels	20.5

3.2 Personnel Management and Responses

In the same fashion, what measures and reactions were taken in terms of personnel management in relation to the increasing inflow of foreign products and product parts, and the expansion of overseas production by business partners? The firms were asked to check all situations that applied. The highest, 46.1 percent, cited “curbing or reducing the amount of overtime,” followed by “reducing bonuses” (34.2%), “reallocation of employees to different posts or different duties” (31.1%), and “placing greater substance on

Table 3. Main Personnel Management Measures in Response to Increasing Inflow of Foreign Products and Product Parts, and Expansion of Overseas Production by Business Partners (multiple answers, N = 486, unit: %)

Curbing or reducing overtime	46.1
Curbing bonuses	34.2
Reallocation of employees to different posts or duties	31.1
Giving more substance to education, training and opportunities to develop abilities	30.9
Freeze on hiring new graduates	27.6
Implementing early retirement schemes with generous treatment	26.7

education, training and opportunities for abilities to develop” (30.9%). (See Table 3.)

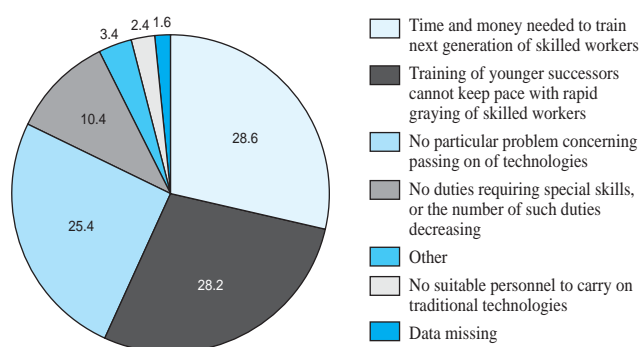
3.3 Passing on Skills

There is an awareness that the passing on of skills is inadequate, occasioned by the globalization of production activity and competition with imported products and product parts. The *White Paper on Manufacturing Infrastructure* also pays attention to the shortage of human resources and future prospects for personnel training. One of the questions in Figure 1 on the status of production activity concerns a decrease in the number of skilled workers. The number of those answering in the affirmative (47.4%) exceeded those responding in the negative (22.6%). On the other hand, 26.2 percent of the surveyed firms agreed that “manufacturing skills cannot be passed on,” whereas 44 percent disagreed. This implies that although the number of skilled workers is in fact decreasing, the passing on of skills has not yet been endangered.

Upon further investigation, 25.4 percent of those surveyed had no problem with skill succession, which means that some 70 percent do have problems in this regard. What are these problems? Figure 2 shows the responses to this question.

The highest proportion, 28.6 percent, chose “it takes time and money to train the next generation of skilled workers.” About the same proportion, 28.2 percent, chose “the training of younger successors cannot keep pace with the rapid graying of skilled workers.” Both items, chosen by a large majority, highlight the underlying fact that skilled workers cannot be created in a short period.

Figure 2. Passing on Skills (N = 500, unit: %)



3.4 Development of Employee Ability

Faced with the globalization of production and competition from imported products and product parts, what measures do firms take? As frequently noted, the

crucial issues are to heighten productivity through “process innovation,” and to expand market shares by producing competitive and unique products through “product innovation.” This means it is vital to foster human resources through education, training and other measures to develop ability.

What kind of measures do business establishments adopt to develop their employees’ ability? (See Table 4.) The most common measure, adopted by 22.3 percent of those surveyed, was “providing opportunities through, for example, proposals for reforms, or group activities, within the workplace.” This was followed by “encouraging employees to acquire various official qualifications by sitting for public and corporate certificate examinations; and reflecting the results of such qualifications in wages” (15.4%); “conducting systematic on-the-job training with trainers assigned” (15.1%); “regular assessments of ability in achieving targets and informing the employee of the results” (14.8%); and “conducting various training programs, including off-the-job training, provided as part of a systematic education and training system” (13.7%).

Table 4. Measures Taken to Increase Employees’ Abilities (multiple answers, N = 495, unit: %)

Providing opportunities through, for example, proposals for reforms, or group activities within the workplace	22.3
Encouraging employees to acquire various official qualifications by taking public and corporate certificate examinations; and reflecting such qualifications in wages	15.4
Conducting systematic on-the-job training with trainers	15.1
Regular assessments of ability in achieving targets; informing the employee of the results	14.8
Conducting various training programs, including off-the-job training, in accordance with a systematic education and training system	13.7
Rotating workers systematically from easier tasks to complicated ones	10.0
Monitoring the degree of worker achievement by forming “a skill development map” or “ability development cards”	7.9
Other	0.8

4. Development of Original Production Technologies and High Value-added Products, and Results

The purpose of this section is to examine the development of original technologies and new methods in production and operations by individual firms and the results, together with the development of original high value-added products, and the affect that has. It also discusses the current state of research and development carried out in collaboration and cooperation between private firms and universities and other research institutions, and how they organize their tasks.

4.1 Production and Duties in the Process of Developing Original Technology and the Method

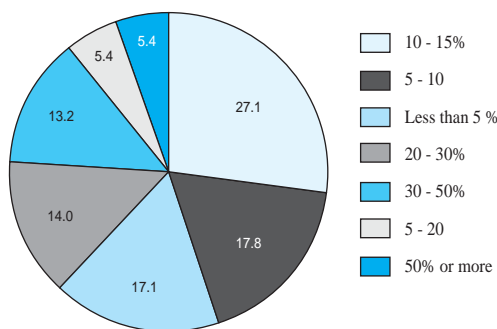
As seen in the previous section, firms cited “innovations in the production process” and “research on and development of new technologies” as ways to deal with the increasing inflow of foreign products and product parts, and the expansion of overseas production by their business partners. Thus we shall now look at the results of a question which asked firms whether they had developed original technologies or adopted new methods within the previous three years for the purpose of furthering production and performance. The result shows that 38.6 percent of all the firms surveyed answered that they had done so.

Another question concerned the impact such development and adoption of new methods had in raising productivity during the past three years. The average impact in raising productivity was found to be 16 percent (19.63 of the standard deviation). (See Figure 3.) Of the answers, “10 percent or more but less than 15 percent” accounted for the highest proportion, 27.1 percent, followed by “five percent or more but less than 10 percent” (17.8%), “less than five percent” (17.1%), “20 percent or more but less than 30 percent” (14%), and “30 percent or more but less than 50 percent” (13.2%).

It seems that original technologies and new methods embrace a variety of things including production facilities, production processes, manufactured products, and so on. Next we will examine these things in terms of individual industrial sectors.

Analyzing such unique technologies and new methods in furthering production and performance, and their impact in increasing productivity with cross tabulation, we note a relatively large number of firms which adopted the “just-in-time” system (or *kanban* system) devised by Toyota, and other methods, claim-

Figure 3. Adoption of Unique Technology or New Methods and the Impact in Raising Productivity



ing that their productivity had risen by 10 to 20 percent. It was also observed that the increase in productivity was not entirely brought about by the process innovation, but also by the ripple effect of product innovation (or conversely). Another feature observed is that, although the impact on the raise in productivity was not very substantial, some firms adopted process innovation as part of environmental protection.

Measures which had substantial impact in raising productivity include those listed below, classified by industrial sector:

(1) Impact of 50 percent or more

Pulp and paper: Three old toilet paper rewinders made 30 years ago were replaced by new machines that can manage wider sheets of paper at a faster speed.

The new machines can also print the paper while rewinding. The replacement is effective in labor saving and in improving productivity.

Chemicals: A new machine has been invented whereby the major product, small capsules, is now speedily packed.

Metal products: Production schedules are now computerized.

Metal products: Cutting products can be now produced by pressing.

Electric machinery and equipment: The just-in-time production method has been fully adopted.

Transportation devices: (a) Machine work; Special high-speed line work has been adopted, aiming to increase production. (b) Metal casting; Aluminum squeeze-casting has been adopted, aiming at better quality products.

Others: Viscosity of gel and technology relating to capsules.

(2) Impact of 30 to 50 percent

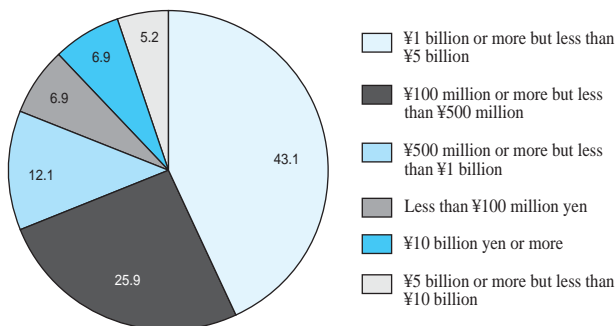
Foods and tobacco products: The effective installation of distant-infrared heaters and infrared heaters, and the establishment of methods to control distribution of in-core temperature enable a firm to stably produce fish sausages — ensuring the precise temperature inside and the desirable toasted surface — without being monitored by specialists. The quality of the products can now be evaluated objectively thanks to the invention and adoption of a device which constantly monitors the texture of the products.

Chemicals: Thanks to TPM (total productive management) activities, business performance, from purchasing to logistics, has been improved, leading to an increase in productivity.

Metal products: Consistent lines from manufacturing

- to assembling have been built.
- General equipment: Part assembling methods have been shifted to cell production.
- Electric machinery and equipment: Productivity improved after the layout of the factory had been changed. Yields increased after revising and improving the production process, from the design stage to the finished product.
- Electric machinery and equipment: Production is now lead-free, and automatic dispensers were introduced.
- Electric machinery and equipment: Microchip product parts. By using semiconductors and establishing 3-D technologies, the firm can now produce thin-model and compact mobile telephones.
- Transportation devices: Assembled camshafts are now produced in large quantities by using cams made of pipe sintered-materials baked onto cast camshafts.
- Transportation devices: Changes in the way revolving shafts have been manufactured have made it possible to use fewer steps to produce products, increasing productivity.
- Transportation devices: The introduction of new technologies has halved the amount of inventories, required space and lead time.
- Precision measuring equipment: The lead time needed to assemble winding equipment and the finishing process have been reduced, considerably improving the asset turnover of inventory.
- Others: The introduction of original automatic machines for complex manufacturing or the manufacture of different shaped products, and in reducing the number of workers needed in the manufacturing processes.

Figure 4. Earning from Original High Value-added Products (N = 58, unit: %)



4.2 Original High Value-added Products

Asked whether or not they have developed a unique high value-added product in the previous three years, 21 percent of the business establishments surveyed answered in the affirmative.

Next, the survey asked how much money their original high value-added products earned. The average amount was ¥3.73 billion. As for individual sums of money raised, the highest proportion, 43.1 percent, answered “¥1 billion or more but less than ¥5 billion,” followed by “¥100 million or more but less than ¥500 million” (25.9%), and “¥500 million or more but less than ¥1 billion” (12.1%). (See Figure 4.)

Next we will examine, by sector, the kind of high value-added products that were developed in the last three years, the extent to which the products have captured the market, and their impact on job creation. Analyzing such unique products developed in the previous three years, and the sales achieved, with cross tabulation, it is found that high value-added products have led to the development of so-called big businesses — including electronics devices, electronic product parts, liquid crystal displays and other products — which have seen rapid technological progress and are replaced with newer products.

High value-added products which have led to “big businesses” include those described below, classified by industrial sector:

(1) Sales of ¥10 billion or more

Electric machinery and equipment: Non-cartridge printers.

Electric machinery and equipment: Semiconductor processing units matching the demands of QCD (quality, cost and delivery) management.

Electric machinery and equipment: New mobile telephones that have appeared with the development of thin-model technology for liquid crystal units.

Transportation devices: Off-shore production of gas (LNG, LPG, etc.) and floating devices.

(2) Sales of ¥5 billion or more but less than ¥10 billion

Electric machinery and equipment: Development of electronic product parts

The survey then asked how the development of unique high value-added products in the previous three years had impacted employment. Respondents were asked to choose one item out of several, including “the number of employees substantially increased.” Some 13 percent of the firms answered that the number of employees had either substantially increased (30% or

more) or increased (10% or more but less than 30%), while the proportion of businesses which answered that the number of employees decreased was 10.6 percent. In addition, those which answered that the number of employees remained unchanged accounted for 59.6 percent, and those which answered that they could not tell at the moment was 17 percent.

How closely are high value-added products associated with employment? Quite a few business establishments reported that the number of employees remained unchanged before and after the invention of such products⁽³⁾. Despite this, the following products tend to demand an increase in the number of employees:

(1) Substantial increase in the number of employees

Electric machinery and equipment: Non-cartridge printers.

Electric machinery and equipment: Establishment of specular silk printmaking process (screens for mobile telephones).

Transportation devices: Development of products using blue LED, curtain shields, valves for fuel tanks, etc.

(2) Increase in the number of employees

Textiles and apparel: The adoption of carbon fiber for use in battery-fuelled sports cars.

Pulp and paper: The introduction of new coating technology has enabled offset and inkjet printing.

Electric machinery and equipment: Production of relays for hybrid vehicles.

Transportation devices: Newly developed bolts.

Precision measuring equipment: Development of color printers has helped bring in ¥1 billion to the company (thermal printer).

4.3 Cooperation with Universities and Similar Research Institutions

To ensure that advanced basic and applied research is commercially developed, partnerships and collaboration between private firms and universities and other academic institutions are drawing increasing attention. Such cooperation is also considered a way to revitalize regional economies.

Businesses were asked if they had collaborated with academic institutions within the previous five years, with 16.8 percent responding yes.

Those that had cooperated with academic institutions were also asked about the frequency of such corporate-academic collaboration. According to the results, the average business establishment had three such partnerships (2.65 of the standard deviation).

While the majority, 37.5 percent, has engaged in such cooperation only once, as many as 23.4 percent of the businesses questioned had entered into such a relationship five times or more.

The highest proportion, 50.7 percent, of these firms applied directly to universities or other academic institutions to find their partners. This was followed by “recommendations from prefectural governments or other related agencies” (25.3%), and “recommendations from parent companies, related companies, or business partners” (20%). It seems that firms tended to actively approach academic and other research institutions.

What were the advantages and disadvantages of cooperation between industrial and academic institutes? The businesses surveyed were asked to mark all the items that applied. The highest proportion, 70 percent, chose, as an advantage, “acquiring information on the latest research and technologies,” followed by “being stimulated to further product development and production” (44.3%), “extending the firm’s network” (35.4%), and so on. (See the first half of Table 5.) On the other hand, the disadvantages mentioned included “it takes a long time to come to fruition” (61.8%), and “it is uncertain whether cooperation is actually beneficial” (59.2%). The resolution of such problems must be counted as a future task. (See the bottom half of Table 5.)

Table 5. Advantages and Disadvantages of Partnerships between Industrial and Academic Institutes (multiple answers, N = 79, unit: %)

Advantages

Acquiring information on the latest research and technologies	70.0
Impetus to product development and production	44.3
Forming new networks	35.4
Way to acquire of new patent rights, etc.	22.8
Intellectual incentives for employees	21.5
Receiving grants or subsidies	20.3
Facilitates hiring graduates of partnered universities	15.2
Increased sales	12.7
Increase in number of new business clients	7.6
Other	1.3

Disadvantages

Takes a long time to reach fruition	61.8
Uncertain whether cooperation is actually beneficial	59.2
Cost is too high	15.8
Difficult to find appropriate partners	11.8
Partners do not understand business	10.5
Collaboration does not lead to business opportunities	5.3
Other	3.9
Differences of opinion with partners	2.6

5. Tasks for Japanese Manufacturers

Concerning the future of the Japanese manufacturing sector, a majority, 76.1 percent, expected that “price competition would become more intensive.” Other scenarios included “their domestic production would continue as long as they manufactured high technology and high value-added products” (71.3%); “mergers and closures of private firms would occur more frequently, with continuing reshuffling of the sector” (55%); “they would be able to continue manufacturing by taking an inventive approach to product development and production processes” (40.4%); “it

Table 6. Future Scenarios for the Japanese Manufacturing Sector (multiple answers, N = 498, unit: %)

Price competition will intensify	76.1
Can continue domestic production as long as they manufacture high technology and high value-added products	71.3
Mergers and closures of private firms would occur more frequently, with continuing reshuffling of the sector	55.0
Can continue manufacturing by taking an inventive approach to product development and production processes	40.4
Will become more difficult to manufacture domestically	34.5
Will be increasingly important to take an inventive approach in both hardware and software aspects	30.1
Globalization of production activities should be promoted	25.1
Japan's contribution to manufacturing will focus on R&D	12.4
Measures concerning subsidies and taxation should be taken	10.6
Breakdown in the passing on of technologies and skills	8.8
Other countries will inevitably catch up with and overtake Japan	7.8
The corporate activities of individual firms and the industrial structure of a country as a whole are different stories	3.8
Safeguards against surges in imports, import taxes and other protective measures should be provided	2.6
Other	0.6

would become more difficult to manufacture domestically” (34.5%); and “it would be increasingly important to take an inventive approach to both hardware and software aspects” (30.1%). (See Table 6.)

How, then, are the respondents contending with the future prospects described above? To understand the survey results more clearly, a diffusion index (DI) has been created so that the proportion of “do not know” and “(the future situation) will remain the same” are put aside, and the proportion of “will decrease substantially” and “will decrease to some extent” is deducted from the proportion of “will increase substantially” and “will increase to some extent.” (See Table 7.)

The results of this questionnaire reveal clear tendencies: the areas in which increased activity is expected are “opportunities for education, training and

ability development,” “overseas procurement of raw materials and product parts,” and “production of major products.” On the other hand, areas where decreases are expected include “number of regular employees” and “prices of major products.”

As seen, it appears that quite a few businesses will continue globalizing their production activities by increasing product procurement from abroad. And many businesses, while expanding the production level of their major products, intend to lower the prices of such products. A surprising fact was that quite a few firms are planning to reduce their number of regular employees.

What, then, are the focal issues in considering the future prospects of the Japanese manufacturing sector in relation to the hollowing of domestic industry? To begin with, as has been repeatedly noted for some years, the focal issue is to increase the added value of products. The future of manufacturers may well depend on whether or not firms possess the key technology, and whether or not they are able to develop technology further. The crucial point, therefore, is probably to secure and foster human resources which preserve and convey technologies. It also seems likely that, where hiring strategies, education and training, and ability development are concerned, firms will tend to put more weight on increasing the number of the creative workforce.

Since it takes time and money to secure and foster personnel, firms may be reluctant to invest in the expense involved at a time when business performance is not flourishing. Nevertheless, once the passing on of

Table 7. Future Corporate Measures

Classification	Item	DI
Areas in which firms expect increased activity	Industrial-academic collaboration	15.5
	Production of major products	34.9
	Number of product items	5.1
	Investment in production facilities (on cash basis)	6.7
	Investment in R&D (on cash basis)	19.5
	Overseas procurement of raw materials and product parts	45.1
	Number of non-regular employees	4.9
Areas in which firms expect to see decreases	Opportunities for education, training and ability development	49.7
	Prices of major products	-37.3
	Number of regular employees	-45.6
	Hiring of workers who have just graduated	-11.3
	Mid-career hiring of experienced workers	-9.6

Note: DI is calculated in such a way that the proportions of “do not know” and “(future situation) will remain the same” are put aside, and the proportion of “will decrease substantially” and “will decrease to some extent” is deducted from the proportion of “will increase substantially” and “will increase to some extent.”

traditional technologies is disrupted, it costs a tremendous amount and takes substantial time to resume these traditions. It is necessary to tackle the preservation of technological development and skills, and human resource development, from a long-term perspective.

No doubt these measures are not enough in themselves to cope with relatively low cost-performance, failure to keep up with the pace of business, lowering of productivity, and other problems which Japanese manufacturers are facing. At the same time, instant results cannot be expected from these measures; since results occur over the long term, it is necessary to embark on them immediately.

Notes:

- (1) The survey of business establishments discussed in this article was carried out by the Employment Information Center in November 2002. Samples of 3,000 establishments with 100 or more employees in the manufacturing sector were randomly stratified from a Teikoku Databank Ltd. database. The questionnaires were sent and returned by post. The rate of return was 16.7 percent.
- (2) The basic characteristics of the business establishments surveyed were:
- (i) Industry: most of the establishments surveyed belong to “the transportation device” (17.2%), “electric machinery and equipment” (14.2%), “foods and tobacco products” (12.8%), “chemicals” (11.2%), and “other” (10.6%) sectors.
- (ii) The average number of regular employees of the business establishments surveyed was roughly 357, with 454.25 of the standard deviation. The highest proportion, 33.6 percent, of the establishments are those with 100 or more but less than 200 employees, followed by those with 200 or more but less than 300 employees (25%); those with 300 or more but less than 500 employees (17.8%); and those with 500 or more but less than 1,000 employees (10%).
- (iii) The average number of non-regular employees (part-time, *arubaito* and other non-regular workers) of the business establishments surveyed was 49 with 109.71 of the standard deviation. The highest proportion, 17.4 percent, of the establishments were hiring 20 or more but less than 50 non-regular employees, followed by “10 or more but less than 20 employees” (13.2%); “50 or more but less than 100 employees” (12.8%); and “one or more but less than five employ-

ees” (11.4%). Incidentally, the proportion of non-regular employees to regular employees averaged 37.96 percent (134.45 of the standard deviation).

(iv) The average number of dispatched workers per business establishment was 19, with 54.30 of the standard deviation. The highest proportion, 16.6 percent, of the businesses surveyed were hiring one or more but less than five such workers, followed by “20 or more but less than 50 workers” (9.8%), “10 or more but less than 20 workers” (8.2%), and “five or more but less than 10 workers” (8%). The average number of contract workers per establishment was 75 (379.52 of the standard deviation); 12 percent of the establishments surveyed were hiring “20 or more but less than 50 such workers.” This was followed by “50 or more but less than 100 workers” (9.8%), “200 or more workers” (8%), and “100 or more but less than 200 workers” (7.6%).

- (3) The impact on employment of the measures described cannot be discussed here for lack of space. For this issue, see “A Report on the Evolution of the International Division of Labour and its Impact on Employment” by the Employment and Human Resources Development Organization of Japan and Employment Information Center below.

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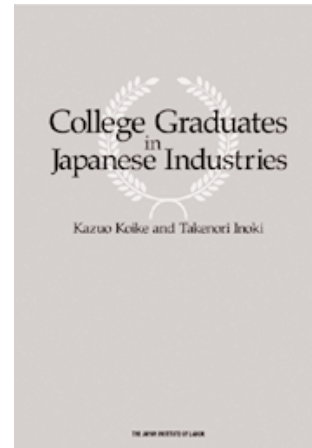
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