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## How Did Intellectual Skills on the Shop Floor Change in the 2000s?

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The major changes that took place on the shop floor in the 2000s were an increase in the number of non-regular workers, primarily contractors and dispatched workers, which continued until 2007, and a sharp decline in production in industries such as the automotive industry, coupled with a reduction in employment focused on dispatched workers, following the September 2008 Lehman Crisis. Intellectual skills are said to be the characteristic of the Japanese shop floor, but how did these skills and the way in which they are formed change amid this situation? According to a shop floor survey conducted within the automotive industry in 2002, intellectual skills were considered to be important and were formed among regular employees in an integrated fashion. The work done by non-regular workers, whose numbers are growing in the workplace, was initially separated from that done by regular employees, but that led to poor efficiency and many such workers quit their jobs. Although their status is “non-regular,” their work experience in that workplace is important. As the economy recovered, there was an increase in their appointment to positions with regular employee status. The surveys conducted by the Japan Institute for Labour Policy and Training in 2007, 2008 and 2009 show that the importance of intellectual skills among regular employees and the methods used to form them have remained basically unchanged. In fact, skills have become more advanced and have penetrated to the level of small and medium-sized enterprises.

### **I. Introduction**

Organizational capability on the shop floor in Japan lies in the intellectual skills of blue-collar workers in workplaces that are responding to change and problems. Amid changes in the environment over the last 20 years, in the form of the diversification of types of employment and the introduction of IT to the workplace, the issue has been raised that a growing number of non-regular workers are not included in “qualification systems, regular wage increases, or appraisals,” which should promote the acquisition of intellectual skills, and a major change in intellectual skills themselves appears to have taken place on shop floors in Japan.

Following the recession at the end of the 1990s, Japan began a gradual recovery from around 2002 and was suffering from a considerable labor shortage in 2006–7. However, the rapid decline in production and employment due to the worldwide recession that followed the so-called Lehman Crisis, resulting from a financial crisis originating in the USA in the fall of 2008, was horrendous. Subsequently, the economy has been on the path to recovery, but it remains uncertain whether or not this will progress smoothly in the future. How have the importance of intellectual skills on the shop floor and the way in which they are formed changed amid such major transformations during the 2000s?

Hitherto, fact-finding surveys dealing with themes arising at those particular times have been carried out on the front line of manufacturing, mainly in the automotive industry, with a primary focus on “intellectual skills,” which refers to the ability to do one’s job. With regard to the theme of this paper, a survey of skills formation and the impact of the growing use of non-regular workers on shop floors in the automotive industry was carried out in the summer of 2002, by the Institute for Industrial Relation and Labor Policy, Chubu (2003) under the title “The Handing Down of *Monozukuri* (the Art of Manufacturing) to the Next Generation and Medium-term Labor Policy.” In 2007, the Institute for Industrial Relation and Labor Policy, Chubu (2008) conducted a survey entitled “Creating a Shop Floor Workplace Where Older People Can Play an Active Role and Issues Relating to This,” concerning middle-aged and older people on the shop floor and workers who have been re-employed, focusing again on the automotive industry.

How has the formation of skills on the shop floor progressed since then? In August 2007, October 2008 and October 2009, the Japan Institute for Labour Policy and Training (JILPT) conducted a survey among companies in the machinery and metals-related sectors, concerning the cultivation and skills development of technicians. These surveys were conducted over the period during which the September 2008 Lehman Crisis occurred, so they are of great value in understanding changes that occurred around that time. This paper seeks to respond to the aforementioned question that has been raised by examining and considering these surveys.

## **II. The Growth of Non-Regular Employment, the Problem of Quality and the Formation of Skills: Based on the Example of the Automotive Industry**

### **1. Problem and Hypothesis**

Since 2000, in the automotive industry, there has been a sharp rise in the number of non-regular workers, such as fixed-term employees and contract workers. Accordingly, the question was raised of whether confusion and a deterioration in quality were occurring on the shop floor. In FY2002, Tomoko Kishi (Faculty of Economics, Nanzan University) and I carried out a study commissioned by the federation of labor unions of Enterprise Group A in Aichi Prefecture. The study involved conducting interviews at the shop floors of six companies and distributing questionnaires to those companies and the managers of each workplace in question.

Although it was a study intended to identify problems, it would not have been possible to ask about issues in depth during the limited time available for the interviews unless we had decided upon a viewpoint that we should examine. The basic hypothesis was whether intellectual skills and integrated skills formation had ceased to be effective.

The term “intellectual skills” as used here refers to the ability to deal with changes and problems outside repetitive tasks and reasoning capabilities in relation to the root causes of problems, and was established at the end of the 1980s by Kazuo Koike. “Inte-

grated skills formation” is a mechanism for the formation of skills, involving a front-line operator spending several years acquiring the ability to deal with problems and the ability to suggest improvements while rotating through various parts of the workplace, and it includes career progression from being an operator to taking up a supervisory position on the shop floor. In contrast, the “separated system” is a mechanism in which the two functions are separated, with operators doing only their usual repetitive tasks, while advanced skills such as dealing with problems are handled by specialists in maintenance or other areas. These operators are not promoted to supervisory positions, so there is no prospect of a career.<sup>1</sup>

Next, respondents were asked about whether there were any problems in terms of running the workplace, resulting from the shift toward non-regular employment. A workplace centered on regular employees is desirable in terms of forming skills and passing them on to the next generation. However, this is fine when the future production prospects are assured, but when the prospects for the future are uncertain, it can result in a surplus in the event of a decline in production, thereby putting pressure on profits. Accordingly, there are rational aspects—in business terms—to determining the fixed number of regular employees according to the lowest level of production, and then using non-regular workers, such as temporary and contract workers, to deal with one-off increases in production. Furthermore, as well as the fact that the labor costs associated with them are lower than those of regular employees, making it possible to economize on welfare expenses, recruitment and education and training costs, using non-regular workers has the advantage that they can easily be dismissed in the event that they become surplus to requirements.

On the other hand, companies lack incentives to have non-regular workers acquire skills in their workplace, as they may quit jobs at any moment. As a result, there is a greater tendency for difficulties to arise in terms of dealing with changes or problems and ensuring quality, which increases the burden on regular employees and those in supervisory roles. Consequently, there is a risk that this will impede the skills formation of regular employees and cause difficulties in passing on skills to the next generation. Eventually, this might even cause stagnation in productivity improvements throughout the workplace as a whole. Is it not the case that proprietors are stubbornly attached to a policy of curbing the number of regular employees and doing too little to cultivate regular employees—who will become the core of the workplace in the future—because they are failing to heed the actual situation and opinions on the front line? The study was carried out on the basis of this hypothesis.

## 2. The Employment Situation in Operational Departments: The Situation in 2002

Let us take a very brief look at the employment situation in operational departments in the automotive industry in 2002, at the time the survey was conducted. From 2000 to

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<sup>1</sup> See “The integrated system and the separated system” in chap. 1, “Intellectual skills” in Koike (2005, 21).

2002, production began to recover to some degree, having previously been slackening. However, companies were still unable to feel confident about the future, so they continued to curb the hiring of regular employees and there was a sharp rise in the number of fixed-term employees and contract workers instead.

With regard to the question of what kind of people become fixed-term employees and contract workers, young Japanese men (aged under 30) accounted for just under half, with those in the more mature age bracket (30–49) accounting for one-third, while foreign nationals accounted for around 20%. When we actually went to the shop floor, we were surprised to find that there were many young people—the so-called *freeters* (young people who depend on odd jobs to scrape a living as a freelance worker of sorts)—whereas we had thought that most would be middle-aged men, based on the image we had of migrant workers a few decades ago.

Having learned their lesson from the slump at the end of the 1990s, companies had become very cautious about downside risks. Accordingly, over 80% of the companies that responded (multiple responses permitted) cited as their reason for using non-regular workers “to adjust the volume of employment in response to economic fluctuations” and more than 60% answered “to economize on labor costs,” while “because we cannot increase the number of regular employees” and “to respond to temporary/seasonal changes in the workload” each accounted for approximately 50% of responses.

### 3. Forming Skills in *Monozukuri* (Manufacturing) and Passing Them on to the Next Generation

What kind of technological changes have taken place on the shop floor in the automotive industry recently and what changes have occurred in the skills required as a result of this? We prepared questions that were the same as the ones that had been included in a survey conducted in 1994 among what was more or less the same enterprise group, and sought to examine changes in technology and skills.

To summarize the results, the importance of “the ability to deal with change or problems, namely, intellectual skills” remained unchanged on the shop floor in the automotive industry. Respondents were asked about the use of “skills charts” and it emerged that these were used company-wide or in most workplaces, whereas they had not been used a great deal in 1994.

When asked about their sense of crisis in regard to forming skills in *Monozukuri* (manufacturing) and passing them on to the next generation, approximately three-quarters of all companies surveyed responded that they had a sense of crisis. The most commonly-cited reason for feeling a sense of crisis was “because it is anticipated that a large number of older, highly-skilled technicians will retire in the future,” which was given by more than half of all companies that responded. The reasons “because there is no leeway to enable veteran workers to provide guidance to young people” and “because we are hiring fewer young people” were each cited by just under half of the companies responding, while “be-

cause the motivation and abilities of young people are falling” accounted for 30% of responses.

However, the aforementioned responses related solely to regular blue-collar work. With regard to the education and training of non-regular workers, the overwhelming majority of respondents answered that “it is undertaken within the scope required” and that it was carried out separately from that of regular employees. In this sense, this does not constitute “integrated skills formation” on the shop floor according to its original meaning. There is a strong sense of crisis about forming skills in *Monozukuri* (manufacturing) and passing them on to the next generation, but only a little under 20% of respondents selected “because there are many non-regular workers” as the reason for this. With regard to this point, the results were different from those of the surveys of the managers of each workplace, showing discrepancies in terms of the awareness of the actual situation between the personnel division and the shop floor.

#### 4. The Growth in Non-Regular Employment and Workplace Management

From the questionnaire conducted among workplace managers with responsibility for the shop floor, we sought to examine the impact of the growth in non-regular employment by comparing shop floors that had a large proportion of non-regular workers with those that had only a small proportion.

When asked in the questionnaire “Is everything going well in terms of passing on skills to the next generation and conducting education and training?,” 33% of workplaces in which non-regular workers accounted for at least 30% of all workers responded “It is not going well.” On the other hand, 29% of workplaces with a small proportion (less than 10%) of non-regular workers answered in the negative, so there was not a great difference between them. In regard to a question that focused on the core issue that “it is difficult to maintain and improve quality,” 55% of workplaces in which non-regular workers accounted for at least 30% of all workers responded in the affirmative; on the other hand, although we thought that the figure would be lower among workplaces in which non-regular workers accounted for less than 10% of all workers, 44% of such respondents answered in the affirmative. Accordingly, we were bemused by the fact that, contrary to our original idea, there was an unexpectedly weak relationship with the proportion of non-regular workers.

What should we think about this point? Does this mean that workplaces with only a small proportion of non-regular workers have only just introduced non-regular workers and are not yet making effective use of them? On the other hand, it may be considered that at workplaces with many non-regular workers, some kind of response has already been implemented in the process of increasing the number of such workers, in light of the many years of experience that the workplace has gained in using them. This is made clear from the examples seen in the workplace interviews.

## 5. Medium-Term Management Policies and the Growth in Non-Regular Employment

It is thought that each company's medium-term business plan is influenced considerably by the medium-term management policy—including the policy on overseas expansion—of Company A, which is the flagship company for the group, as well as the employment policy based on this. The medium-term outlook for domestic production by Company A is to maintain the status quo, but it had been revised to take greater account of downside risk than previously. Consequently, cutbacks in the hiring of regular employees began in FY2000, particularly in operational departments, and these were still ongoing as of 2002. At the same time, the company was coping with a short-term increase in actual demand by means of backup from outside the company, such as from group companies, and the hiring of fixed-term employees, with the company changing its policy on the share of personnel directly engaged in production, raising the upper limit from 20%, which it had been hitherto, to 25%.

Amid this situation, each company, except for Company C and Company F, which had already been promoting a full-scale switch to non-regular employment, seems to have switched to a policy of curbing—or, at best, maintaining the status quo—the number of regular employees in blue-collar work. However, actual demand for motor vehicle products and components increased from FY2000 and each company sought backup from outside the company and increased the number of fixed-term employees and contract workers in order to cope with this.

## 6. Devising Ways to Retain Non-Regular Workers

All of the workplaces where interviews were conducted had experienced many personnel changes and a great deal of confusion on the shop floor when large numbers of non-regular workers began to be introduced, and there had been frequent complaints. After this initial experience, each workplace had devised its own ways to try to retain non-regular workers. These can be summarized as follows:

- i. Selecting more settled people and giving preferential treatment to those with experience;
- ii. Paying wages above the market rate and providing continuation allowances;
- iii. Inviting non-regular workers to recreational activities and social events in order to build interpersonal relationships as members of the same team;
- iv. Opening up the path to becoming a regular employee.

When non-regular workers—particularly contract workers who are affiliated to a different company—are first introduced, there is an inevitable tendency to treat them in a rather distant manner, and this makes work-related collaboration difficult. Accordingly, it is important to make efforts to involve such workers on the shop floor as members of the same team, working in the same place, even if their pay and conditions, and contracts differ. In fact, there were workplaces at which this had led to an increase in skills and morale among

non-regular workers, with production taking place smoothly, even though there was a large number of such workers.

It is perhaps easier to understand if an example is selected from among the interviews and explained in more specific terms. The following is an introduction to Company F, a medium-sized automotive component company. Company F is located in Kyushu and the proportion of fixed-term employees among its blue-collar workers was very high, at 75% at the time, so before our visit, we were concerned about how production was going there.

However, when we actually visited, we discovered that young, energetic fixed-term employees in their 20s were working there, and they greeted us with loud voices. When we asked the company president about this, we were told that when hiring male blue-collar workers for regular positions, rather than hiring new graduates as regular employees, like other companies, the company only appoints such staff from among its fixed-term employees. The reason for this is that the company had taken into consideration the fact that its fixed-term employees would lose their motivation if regular employees were hired from among new graduates.

In order to encourage staff to take the initiative in learning as many processes as possible, irrespective of their employment type, the company put up a “skills work sheet” in the workplace, which motivated staff to acquire skills, and this became the evaluation criterion for appointment to quasi-regular and regular employee posts. In addition, when we asked the employee about how they felt about the sheet being put up in the workplace, they said it was good, because it motivated them.

Thus, over the course of four or five years, the company has sought to promote the retention of staff, looking beyond differences in forms of employment, such as fixed-term employee or contract worker, and has endeavored to involve such staff on the shop floor through appropriate skills development, which has led to production progressing more smoothly.

## 7. Policy Responses to the Growth in Non-Regular Employment and the Problem of Quality

In light of the above, what kind of policy responses can be devised in relation to the growth in non-regular employment and the problem of quality? First of all, I would like to affirm that the stabilization and continuation of work is vital for both non-regular workers and for shop floors. Accordingly, rather than excluding or separating non-regular workers, it is important to deal with the issue by adopting a stance of integrating them into the workplace. I would like to actively support opening up the path to regular employment as one means of doing so.

The law has been amended to enable the employment contracts of fixed-term employees to be extended to up to three years, and the time frame for the employment of dispatched workers on shop floors was also extended to three years from March 2007. One can say that employment has stabilized compared with the situation previously. However, one

must not forget that the fact that it is an employment contract with a set time frame means that such staff have been employed based on the understanding that the employment contract will end if employment has to be reduced due to a decline in product demand.

### **III. Subsequent Endeavors to Secure and Cultivate Technicians**

#### **1. From the 2007 JILPT Survey**

From 2003 to 2007–8, the economy recovered, albeit gradually, and a labor shortage even began to be seen from 2004. Amid this situation, non-regular employment increased further at manufacturing industry production sites. In particular, the embargo on dispatched work in manufacturing industry was lifted in March 2004 and there was a sharp rise in the number of dispatched workers, replacing the contract workers used hitherto. Furthermore, concerning the issue of the transfer of skills to the next generation, there was a great deal of concern about the “2007 problem,” referring to the year when the so-called “baby-boom generation” would reach the mandatory retirement age.

In Japan Institute for Labour Policy and Training (2008), a survey was carried out in August 2007 targeting business establishments in the machinery and metals-related sectors, focusing on the use of diverse forms of employment in manufacturing-related workplaces and its relationship to the securing and cultivation of technicians and engineers. Let us look at the main results obtained from this.

There had been an increase in the number of so-called “external personnel” not directly employed by the company, such as dispatched workers and contract workers. The better the business performance of the business establishment over the previous three years, and the better its long-term business prospects in relation to the volume of production and orders for its main products, the higher was the proportion of external personnel. It is likely that the number of regular employees had also increased in such business establishments.

When looking at fluctuations in regular employees according to the situation in regard to fluctuations in non-regular employees over the previous three years, the study found that the number of regular employees had increased at approximately 60% of the companies at which the number of non-regular employees had increased, while conversely, the number of regular employees had decreased at 60% of business establishments at which the number of non-regular employees had decreased. Looking only at the status of fluctuations, it can be seen that there is no simple substitution relationship in which the number of regular employees decreases if the number of regular employees increases (or vice versa).

When respondents were asked about changes at or effects on the manufacturing site arising from the use of non-regular employees, the greatest number of responses was accounted for by “it has become possible to deal with sudden increases in the workload.” A comparatively large number of responses was accounted for by “it has become possible for regular employees to dedicate themselves to more advanced operations” and “it has ceased to be necessary to tamper with the employment of regular employees in response to fluctua-



tions in demand,” while “there have been no particularly noticeable effects or changes” accounted for approximately 20% of all responses.

Unexpectedly, few cited the negative effects that we anticipated in the 2002 survey, namely “the burden of site management on regular employees has increased” (14.7%) and “it has become difficult to accumulate and pass on know-how” (10.4%). This would seem to be because companies have become more efficient as a result of having used non-regular employees for many years.

When respondents were asked about the knowledge and skills required of skilled regular employees, the answers demonstrated that the greatest importance is attached to “knowledge and skills relating to the rationalization of production processes” (28.5%), followed by “advanced, outstandingly proficient skills” (19.4%), “knowledge and skills relating to the maintenance and improvement of equipment” (12.0%), “knowledge and skills relating to quality control and inspection/testing” (10.7%), and “skills relating to handling multiple processes singlehandedly” (9.4%). Moreover, the survey reports a considerable decline in those responding “skills relating to assembly and adjustment” at business establishments where non-regular workers account for at least 30% of all workers. The term “intellectual skills” is not used, but one can see a tendency toward separation, in which regular employees are required to have even more advanced intellectual skills, while comparatively simple tasks are left to non-regular employees.

When respondents were asked to evaluate the cultivation of skilled regular employees, just under half answered “it is going well,” but the proportion giving this response declines among business establishments with a higher proportion of non-regular workers. The reasons given for why this was not going well included “because there is a lack of middle-ranking employees,” “because more-experienced employees are too busy to provide junior employees with guidance,” and “because few young employees are assigned to manufacturing sites.” In other words, it is because there are too few regular employees in comparison to the number of non-regular workers.

When respondents were asked about whether they had been able to hire new graduates as skilled regular employees as planned over the last three years, approximately one-third of business establishments answered that they had not been able to hire them as planned. One of the measures to deal with this is the appointment of regular employees from among the ranks of non-regular employees, contract staff, and dispatched workers, etc. With regard to the appointment of regular employees, approximately 23% of respondents stated that they “have a system,” while just over 40% stated that “there is no system, but we do this in practice”; thus, in total, approximately two-thirds of respondents stated that they offered opportunities for appointment as regular employees. Furthermore, approximately 80% of respondents stated that they had actually appointed such staff over the past three years. Among business establishments that allow non-regular workers to do jobs involving skills that take time to acquire, the proportion responding that they “use external personnel, such as contract or dispatched workers” and the proportion responding that they “appoint

regular employees from among the ranks of non-regular employees, contract staff, and dispatched workers, etc.” is significantly higher.

## 2. From the 2007 Case Study: Positioning of Dispatched Workers

In order to gain a more specific insight into the use of external personnel, such as dispatched workers and the impact this has on human resource development, I shall highlight the main points from the interview-based survey of business establishments.

“At Business Establishment A, where dispatched workers account for approximately 20% of the 500 or so employees, dispatched workers, etc. are hired because it is unclear whether the current good business performance will continue. . . . A commensurate period is required for workers to become proficient at their tasks, but because there are cases of dispatched workers quitting suddenly, even when education is provided, they are confined to simple work.”

“At Business Establishment D, it was taken for granted that training would be carried out for regular employees on the basis of long-term employment, and that work would be assigned to them on the shop floor for many years. However, due to the increase in dispatched workers, this attitude is losing currency. . . . Nevertheless, no matter how much the jobs done by dispatched workers might be described as simple support tasks, operations on the shop floor do not progress smoothly unless they learn the key points. Accordingly, it becomes necessary to provide education and training for dispatched workers. . . . Over the past three years, six dispatched workers have been appointed as regular employees.”

“For Business Establishment F, dispatched workers entail the advantage that hiring is dealt with by the temporary staff recruitment agency and the business establishment can reliably secure the personnel that it requires. Even if the workload increases in the future, it will be difficult to deal with it by increasing the number of regular employees hired or having dispatched workers switch to being regular employees, if the business establishment wishes to prevent further employment adjustments.”

“At Business Establishment G, the increase in workload is forecast to continue for some time into the future, but if the workload increases, while it might hire a few more regular employees, it mainly tries to deal with the increased workload by using dispatched workers and contractors. Company G has a policy of not conducting employment adjustment among regular employees, so it feels that if it adds too many regular employees to handle increases in production, it will become unable to adhere to this policy when the production volume falls again.”

These examples show that although regular employees are appointed from among the ranks of dispatched workers in some cases, there is a strong sense that businesses want to avoid conducting employment adjustment among regular employees when product demand falls, even if it is strong at present. Accordingly, it can be seen that businesses are very cautious about hiring regular employees.

### 3. The Use of Continued Employment of Elderly People

In Japan Institute for Labour Policy and Training (2009), a survey was conducted in October 2008, immediately after the Lehman Crisis. Respondents were asked whether they implemented continued employment among technicians aged 60 or above as one method of securing core technicians. Two-thirds of the business establishments that responded stated that they were implementing such a system, with many of them having put the greatest effort into securing multi-machine handlers.

Focusing on whether this new trend, where most of those who took mandatory retirement remain in the workplace, has caused any new issues at the workplace to which they were assigned, and with the objective of examining approaches to workplace management that seeks to increase the motivation to work of those employed under the continued employment system and have them take on roles proactively, I became lead researcher on a study for the Institute for Industrial Relation and Labor Policy, Chubu (2008) entitled “Creating a Shop Floor Workplace Where Older People Can Play an Active Role and Issues Relating to This,” and commenced my research in September 2007. I would like to introduce some of the results obtained from this.

In the study, a questionnaire-based survey was conducted in February 2008 among 504 managers and supervisors at Enterprise Group A in Aichi Prefecture, and among 552 employees who had been re-employed. One can see that, among those who had taken mandatory retirement, the proportion of those securing employment thereafter has been increasing markedly, from 30% in FY2005 to 53% in FY2006 and 57% in FY2007. Nevertheless, this is still only 60%, so the figure is expected to grow further in the future.

In the questionnaire, when the shop floor managers and supervisors were asked “Looking at the situation overall at your workplace, do you think it is a workplace in which re-employed workers can play an active role?,” 56% of respondents answered “Yes,” while 44% answered “No.” The workplaces in which there was a large number of “Yes” responses were indirect workplaces, such as those involved in “education,” “improvement,” “maintenance,” and “inspection and packaging,” while a large number of “No” responses was received from direct shop floors, such as “fabrication,” “welding,” and “vehicle assembly”; the workplaces in the latter category involve laborious, fast-paced work, which is often carried out via the shift system.

With regard to the location of the workplace in which these workers are re-employed, the overwhelming majority (84%) are employed in “the same business establishment and

the same workplace in which they worked before retiring.” When respondents were asked about their annual income (including pensions, etc.) compared with the situation before reaching the mandatory retirement age, 12% stated that it was “60–70%” of the previous level, while the most common answer was “about half,” received from 46% of respondents, and 39% stated that it was “30–40%,” so it can be seen that income falls considerably. When respondents were asked about their “level of satisfaction with being able to work under the re-employment system,” looking at the results by the proportion of annual income, the greatest proportion of those who were satisfied was seen among those whose annual income was “60–70%,” at 83%, while 73% of those whose income was “about half” and 69% of those whose income was “30–40%” stated that they were satisfied. Thus, although there is a drop in satisfaction, the decline does not seem to be as substantial as the large fall in annual income. Until a few years ago, it would have been difficult to be re-employed by the company and workplace at which one had worked until that point, so it is likely that there are many people who are grateful for the opportunity, even though their wages have dropped significantly.

Managers and supervisors were asked about the advantages of elderly people continuing to work, from the perspective of “demonstrating proficient skills,” and I compared the responses of supervisors who had replied “I think that re-employed workers can play an active role” with those of supervisors who had responded “I do not think so.” Whereas the proportion of those who thought that “they can pass on their proficient skills to young people” was 88% among supervisors who had replied “I think that they can play an active role,” it was much lower among supervisors who had replied “I do not think that they can play an active role,” at 54%. In the section of the questionnaire provided for comments by respondents, the most common opinion among supervisors was that “It is almost impossible to treat re-employed workers as ‘one full-time equivalent’.” With regard to re-employed workers themselves, even at workplaces where supervisors had replied “I do not think that they can play an active role,” approximately 70% thought that they could demonstrate their skills, so there is a considerable gap between the workers and the supervisors.

Respondents were asked about issues in the workplace resulting from elderly people continuing to work after reaching the mandatory retirement age. The most commonly-cited issue was “it is difficult to rotate or redeploy them, as the tasks that they can do are limited.” This issue was cited by as many as 89% of supervisors who had answered that “I do not think that they can play an active role,” and was even quite high among supervisors who had replied “I think that they can play an active role,” at 69%. Moreover, the issue “it is difficult to introduce new equipment and new technology to the tasks that they are handling” was mentioned by quite a large share of all supervisors, with 59% of supervisors who had answered that “I do not think that they can play an active role” and 49% of supervisors who had replied “I think that they can play an active role” citing this as an issue.

The majority of re-employed workers were doing the same job in the same workplace as before their retirement, so this issue is thought to result from the tasks that they could do

in that workplace having been limited even before their retirement. Although the term “wide-ranging skills development” has frequently been referred to, it is presumed that most middle-aged and older workers have few opportunities for training in new equipment and new technologies.

With regard to future skills development, it is important to develop an attitude and support system aimed at proactively broadening the experience of those in their 40s and 50s, with a view to their continuing their careers until the age of 65. More specifically, it would be desirable to implement proactive rotation and redeployment, including dispatch overseas, provide training in new equipment and technologies, and provide training opportunities that would facilitate a transfer to an indirect workplace.

#### 4. From after the Lehman Crisis until 2009

In Japan Institute for Labour Policy and Training (2010), a study entitled “The Cultivation and Skills Development of Technicians Amid a Changing Economic and Business Environment: The Current Status of the Machinery and Metals-related Sectors” was conducted from around November 2009, focusing on the machinery and metals-related sectors, as in the previous survey. Let us look at the main results to see how the cultivation of technicians changed due to the transformed environment brought about by the Lehman Crisis in September 2008.

Respondents were asked what employment adjustment measures they had taken after the Lehman Crisis. The most common response was “curbing overtime,” followed by “temporary suspension of operations” and “curbing hiring,” which were cited in more than 50% of responses, while “adjustment using external personnel, such as contractors and dispatched workers” and “ending the employment of temporary workers, fixed-term workers, and part-time contract workers, etc.” each accounted for approximately 30% of responses. At the same time, business establishments that implemented “employee dismissals” and “solicited applications for voluntary redundancy” accounted for approximately 10% of respondents, so comparatively few business establishments dealt with the situation by reducing the number of regular employees.

It is thought that this kind of sequence of employment adjustment measures remains basically unchanged from the major recessions of the past. In many cases, fixed-term employment was ended, while hiring of regular employees was curbed and temporary suspensions of operations took place using employment adjustment subsidies to maintain existing employment.

The most common management-related initiative undertaken over the previous three years was “reducing personnel costs and rethinking manpower management,” while more than half of the business establishments cited “the quality of technicians” as the issue to which they wished to devote their energies to achieving improvements, in order to maintain and strengthen competitiveness in the future. So what kind of technicians are being sought? There is currently a shortage of “multi-skilled workers,” “highly-proficient technicians,”

“technicians with engineering skills,” and “personnel suitable for managerial/supervisory roles”; more than 50% of business establishments stated that they lacked all these types of technician. The fact that there is a shortage of these even during a recession demonstrates that they were not adequately cultivated previously.

When respondents were asked about the methods used for the cultivation and skills development of skilled regular employees, the most common method cited as being used at present was “daily guidance provided by managers to their subordinates and by more-experienced workers to their less-experienced colleagues,” followed by “implementing systematic OJT, having selected an instructor” and “job rotation progressing from simple tasks to harder work.” With regard to their future education policy, approximately 60% of business establishments stated that their policy hitherto and their policy for the next three years was “to focus on raising the level of staff overall,” so there was no change compared with the situation previously in regard to this point.

When respondents were asked about the use of non-regular employees and external personnel, such as dispatched and contract workers, the proportion of business establishments that stated that “there are no applicable employees at present” was approximately 30% in the case of non-regular employees and approximately 50% in the case of external personnel, so one can see that there has been a sharp drop in their numbers. With regard to external personnel, there is a fairly strong tendency to restrict the scope of the duties that they undertake or to curb the number of such workers.

## 5. From the 2009 Case Study: The Cultivation and Skills Development of Technicians

In this study, interview-based surveys were conducted regarding the cultivation and skills development of skilled regular employees at manufacturing businesses in the small and medium-sized enterprise category, having around 100 employees. I shall highlight the points that stand out in this study.

“Hitherto, Company B has used mid-career employment to secure personnel to replace employees who have quit. However, in 2009, with the objective of passing the skills of elderly workers on to the next generation, it hired three new graduates from a technical high school for the first time. . . . Since being hired, they have been cultivated through education and training centering on OJT and are transferred between manufacturing processes as appropriate.”

“Processing skills are required in the manufacturing processes at Company C, so new graduates are primarily cultivated through OJT. The goal of Company C is to cultivate multi-skilled workers by transferring them between each department, so that they can handle a variety of machines.”

“Company D anticipates that it takes ten years for workers to become able to assume a leadership position. The cultivation of technicians is carried out via OJT, with workers being assigned to the shop floor immediately after being hired. In each division, a person in charge creates a skill map to gain an understanding of the skill level and issues for each and every employee, and makes use of this in cultivation and skills development.”

“At Company E, technicians are required not only to be familiar with a series of work processes for manufacturing, but also to have highly proficient skills, including experience and knowledge backed up by theory and the ability to pinpoint the root causes of defects.”

“Currently, the technicians that are felt to be lacking at Company F are personnel who can serve as multi-skilled workers, and managers and supervisors. . . . However, it is very difficult to secure and cultivate them.”

“At Company I, there are regular employees, quasi-regular employees, and dispatched workers, and there is no major difference between them in terms of the content of the work that they do on the shop floor. Those quasi-regular employees and dispatched workers who have the requisite motivation and skills are appointed as regular employees.”

From these examples taken from interviews, it can be seen that there has been no change in the fact that the “quality of technicians” is important, even after the Lehman Crisis. In addition, one can see that their skills can be described as intellectual skills and that the cultivation of multi-skilled workers using skills charts has become widespread, even at the level of small and medium-sized enterprises.

#### **IV. Conclusion**

The major changes that took place on the shop floor in the 2000s were an increase in the number of non-regular employment, primarily contracting and dispatch work, which continued until 2007, accompanying the economic recovery, and a sharp decline in production in the automotive industry, coupled with a reduction in employment due to layoffs—primarily of dispatched workers—as a result of the September 2008 Lehman Crisis. How have the importance of intellectual skills on the shop floor and the way in which they are formed changed amid such major transformations during the 2000s?

Hitherto, fact-finding surveys dealing with themes arising at those particular times have been carried out on the front line of manufacturing, mainly in the automotive industry, with a primary focus on “intellectual skills,” which refers to the ability to do one’s job.

With regard to the theme of this paper, a survey of skills formation and the impact of the growing use of non-regular workers on shop floors in the automotive industry had already been carried out in the summer of 2002 by the Institute for Industrial Relation and Labor Policy, Chubu (2003) under the title “The Handing Down of *Monozukuri* (the Art of Manufacturing) to the Next Generation and Medium-term Labor Policy.” In 2007, the Institute for Industrial Relation and Labor Policy, Chubu (2008) conducted a survey entitled “Creating a Shop Floor Workplace Where Older People Can Play an Active Role and Issues Relating to This,” concerning middle-aged and older people and workers who have been re-employed, focusing again on the automotive industry.

How has the formation of skills on the shop floor progressed since then? In August 2007, October 2008 and October 2009, the Japan Institute for Labour Policy and Training (JILPT) conducted a survey among companies in the machinery and metals-related sectors, concerning the cultivation and skills development of technicians. These surveys were conducted over the period during which the September 2008 Lehman Crisis occurred, so they are of great value in understanding changes that occurred around that time. This paper seeks to respond to the aforementioned question that has been raised by examining and considering these surveys.

From the survey conducted in 2002, it can be seen that intellectual skills were important among regular employees, and that their development was taking place in an integrated fashion, at least among regular employees. However, amid a situation in which future sales were uncertain, companies increased non-regular employment, with the objective of reducing costs as well. Initially, the work that these employees did was separate, but this was inefficient and there was a great deal of attrition. Despite being “non-regular,” work experience in that location was important, so these workers were gradually integrated into the workplace, and their appointment as regular employees increased as the economy recovered.

Moreover, the number of re-employed workers on shop floors increased, albeit on one- and two-year contracts. Unexpectedly, the skills that they had were not necessarily wide-ranging and transferable to new equipment and technologies.

From the surveys conducted by the Japan Institute for Labour Policy and Training in 2007, 2008 and 2009, it can be seen that the importance of intellectual skills among regular employees and the methods used to form them had basically remained unchanged. In fact, skills had become more advanced and skills development had penetrated to the level of small and medium-sized enterprises. It was at this point that a sudden slump occurred as a result of the Lehman Crisis, with the operation rate of factories dwindling by 40–50%.

We have just seen how employment adjustment took place on shop floors amid this situation. The employment of many fixed-term employees, who were employed for a fixed time frame, and that of dispatched workers was terminated. It is a fact that this protected the employment of regular employees. Although the fluctuation was sharper than had been expected, this kind of situation can be seen as being “within the expected scope” as shown in



the medium-term management policy of Company A in the 2002 survey.

In Japan, a “clear” standard such as the “last in, first out” policy used in the USA, where those who have the shortest length of service in the workplace are the first to be dismissed, is not generally permitted.<sup>2</sup> This means that when personnel adjustments are required, there are disputes about “who to dismiss first.” In order to avoid this, non-regular workers have to accept non-regular worker status with a fixed period of employment from the hiring stage, which puts them further up the list of those at risk of job losses in the event of a management crisis. As shown in the examples, if a fixed-term employee were positioned as an “apprentice regular employee,” then in one sense, one could see this as an order of dismissal based on the “last in, first out” standard used in the USA. In this situation, it has come to be seen as desirable for both regular and non-regular workers, as well as for the business, to adopt a method in which the path toward becoming a regular employee is opened up if business is developing smoothly and if the individual concerned makes an effort, and in which the division between the two statuses is minimized, as far as possible.

Nevertheless, in cases where the burden of job losses has been shifted onto non-regular workers alone, it has become clear that the safety net in the event of unemployment—such as the application of employment insurance in the labor market, housing allowance, and the lack of a guaranteed minimum income—is very poor. There is a strong need for a permanent system to be established to deal with this.

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