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How Important was Skill in Japanese Manufacturing Firms ?

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1 Importance of skill in manufacturing and conceptual problems

Skill as a decisive factor in competition In these twenty years it has been repeatedly claimed that the high level of skill possessed by workers has contributed a lot to the success of Japanese manufacturing firms. Kazuo Koike, among others, is one of the most cited authors who try to explain high performance in production lines in terms of the highly skillful handling of line operators. This kind of explanation seems to offer a credible explanation of Japanese business success in the 1980s and so far has been accepted as a fact.

In this explanation it is supposed that, if technical and administrative arrangement such as types of machinery and methods of administration are equal, the degree to which skill of workers who handle machinery have developed is the most crucial factor in deciding competitiveness of production lines. Among the several kinds of skill listed by Koike and others, two kinds seem to be noteworthy. One is multi-skills possessed by production workers and the other is the cognitive ability of workers who are able to infer causes of an accident from various symptoms without any help of engineers.

The theory which explains high performance of the manufacturing sectors by pointing out the developed state of skill formation among Japanese workers have done good work by directing our attention to the role of skill in manufacturing. Together with the human capital theory and the concept of internal labour market, it has contributed a lot to make clear the function of shop floor organization. In a sense the theory has been successful in focusing on one aspect of manufacturing.

Vague character of concept Although the skill- centered theory has done a good work, it has some weak points on which we can challenge the validity of the theory. One of the points to be contested is lack of clear definition of the concept of skill. The concept covers such a wide area of the human activity that it can be applied to almost every kind of workers' behavior. Relying on the inclusive character of the concept, the theory

deliberately changes the meaning of the term "skill" when it explains the character of a specific organizational structure of shop-floor. In some case the term refers to the manual dexterity or the quick handling of machinery, in the other case the term is employed to explain the quick response to and adequate handling of emergencies on the shop-floor.

Measurement The difficulty in measuring the level of skill is closely related to the conceptual vagueness. It is hard to know how much the skill of workers in a particular section of a company has developed. Without measuring the degree of skill formation, we cannot compare the level of skill between departments, firms. International comparison is also difficult. The theory we have dealt with does not offer any clue for measuring the degree of skill formation.

Type of Workers The type of workers to which the theory is mainly applied poses another problem. There are at least three types of workers in production lines, namely operators, maintenance workers and first-line supervisors. It is not certain whether the maintenance workers or supervisors are the workers to which the theory is supposed to be applied. If we emphasize the importance of manual dexterity, maintenance workers and supervisors might be excluded from the group of skillful workers. In case of the responsive behaviors to an emergency situation such as a trouble in operating machines, we cannot expect too much of line operators.

Our assumption In this paper, we will not discuss those epistemological problems. It might not be useful for our understanding of the production process to argue whether or not Japanese workers have more skill than other workers unless we have some measurable data.

We want to see the problem of skill in a perspective which is quite different from arguments about those epistemological questions. In this paper we will focus on personnel policies of Japanese manufacturing firms which we think limited the application of accumulated skill. In order to avoid discussing epistemological problems, we will assume in the following discussion that a worker has accumulated a large amount of both general and specific skill by working in a particular production line. And those skills have been quite useful for promoting the higher productivity. What we want to emphasize is that, even though specific skill has been very important in manufacturing, there has existed more important factors in management than the continued use of specific skill.

Transfer of Workers as a limiting factor As one of limiting factors, factors which limit the application of specific skill, we will pay attention to the personnel policy of transferring workers from types of job to which they are accustomed to different kinds

of job. Another limiting factor is the managerial methods which define the type of skill workers are expected to have. We want to consider the relation of managerial methods with the type of skills in another paper.

If transfer of workers to different kinds of job is widely observed, the fact will cast a doubt on the validity of the contention that the Japanese firms have successfully put emphasis on the skill-formation of workers. Transfer to different kinds of job means the loss of the value of skills, especially the skill quite specific to a particular production line. Since transfer has been closely connected with practice of long-time employment on which management put great value, even if management thought that transfer was detrimental to the effective use of specific skill, they dared to implement a transfer plan.

As will be shown below, up until now the personnel policy of transferring workers to different kinds of job had been accepted by large-scale Japanese manufacturing firms as a necessary tool for guaranteeing employment security to their workers.

Yawata Steel Works In this paper, we choose a steel works as a case illustrating the problem we have just mentioned.

One of the reasons why we select the steel industry is that there is consensus among researchers that the steel industry is one of the industries which have require workers to accumulate a large amount of specific skill by way of working for a long time in a particular production line. Prof. Koike who stresses the importance of acquiring specific skill by on-the-job training initially established his argument on the basis of his observation on production lines in the steel industry.

We would like to repeat the point that we will not deny the importance of specific skill in the production of iron and steel. The only thing we want to say is that we have to take into consideration the existence of such a limiting factor in evaluating the role of skill in Japanese manufacturing sector.

The Yawata Steel Works was established by the Japanese Government. It continued to be a governmental enterprise until 1934. Since then it has been a part of a monopolistic private company. The Yawata Steel Works is located in southern island of Kyusyu where they started making steel in 1901 and up until early 1970s it had been the largest steel works in Japan with the most advanced technology and management style. The Yawata Steel Works consisted of numerous mills, each of which contained one or two production lines in order to produce a semi-final or final product. There existed more than a hundred mills in the mid- 1930s. The three basic divisions in the process of making iron and steel, such as iron making, steel making and rolling has not changed over decades. Iron made in the blast furnaces was converted into steel in open hearths or in converters. Then steel was processed into steel products in roll mills. Integrated

steel works such as Yawata Steel Works performed those various processes of manufacturing in the same place. Because of the complex character of production, work and skill required was quite different among constituting mills.

The institutional framework surrounding transfer of workers had been well established by mid-1960s. Therefore we would like to limit our scope for the study of transfer in the Yawata Steel Works to the period from its early days to mid-1960s. In the 1970s, the management found a new value in transfer of workers. As an illustration of new usage of transfer we will show a national survey instead of focusing on the case of the Yawata Steel Works.

Definition of transfer It has been quite ordinary for a Japanese firm to order workers to change their jobs with or without their consent. Putting aside the practice of promotion, there are several kinds of transference. We will limit the application of the term "transfer" (Haiten or Haich-tenkan in Japanese) to the case where a worker is ordered to move to another section in the same plant for a long period. Either change of job within a section such as rotation or temporary help which requires a worker to work in other sections only for a short period will not be included in the concept of transfer in this paper. It is, however, useful to treat temporary help along with transfer in discussing labour transference. They are similar in character in the sense workers are ordered to move out of their shop-floor and to be engaged in different jobs. Two concepts differ only in the period during which workers are expected to work.

In a plant it is a part of daily management to fill the vacancies caused by natural attrition like resignation and retirement. Management has to choose whether they will hire new hands or transfer workers from other sections. When a firm extends the scale of production, there will be a demand for workers.

On the other hand, a firm faces a surplus of workers when business slack. And sometimes firms deliberately try to produce excess workers by way of introducing new machinery. In those cases management has to choose whether they will retain redundant workers, dismiss excess workers or transfer them to other sections. In the large-scale manufacturing firms, both management and labour considered dismissal should be avoided at any expense. Then there is no other choices than retention and transfer.

In large organizations it is not rare that some sections have excess workers while in other sections workers are in need. Under this condition , management can easily transfer workers from slack sections to busy sections with the coordination of the central personnel department.

In any case there were always alternatives to transfer. It was up to management

to decide whether they would hire new workers or transfer workers from other sections.

Although transfer has occasionally taken place between different plants of the same company, such kind of transfer is an emergency measure taken by a company which faces a closure of a plant. In ordinary cases, by an order of transfer, workers, especially production workers, move within the same plant.

2 The transfer of workers within the Yawata Steel Works and its relation to skill

As an illustration of transfer of workers, we will show a transfer plan which was discussed between management and the trade union in May 1956 at Yawata Steel Works. By that time, it was already agreed between management and the trade union that a monthly plan of transfer of workers should be discussed between both sides in the previous month of the implementation of the plan. By the agreement, even if the union disagreed with a plan prepared by management, management had a right to implement the plan. It turned out that, despite the agreement, management has sought to get the consent of the union. If they were faced with disagreement of the union, management dared to amend their original plan. Then, with few exceptional cases, management has been able to carry out transfer plans with union consent.

Only several sections were involved in the monthly plan shown in the table 2-1. It was, however, ordinary for a lot of sections to be involved in a plan. The plan shows that hiring new workers and transfer of workers from one section to another were employed as methods for labour adjustment. In other cases, the third method of temporary help (Ouen in Japanese) was also used in addition to hiring and transfer of workers. At Yawata the difference between transfer and temporary help has been that in the former workers are expected to stay longer than two months in the mills to which they transfer and they will remain there until they are ordered to transfer again, while in the latter workers will come back to their mills within two months.

In the three pages of the plan presented in May, 1956, in page one, fixed and present number of workers for sections facing the shortage of workers were registered. In the second page, fixed and present number of workers for sections which had excess workers were listed. And in the page three, it was proposed by management that a section in need of labour would be supplied workers either by way of hiring (Shinki-saiyo in Japanese) or transfer of workers (Haiten or Haich-Tenkan in Japanese) from a redundant section.

The plan was similar to the financial account. The total number of both surplus workers and redundant workers was supposed to be equal. In this case hiring was dealt with as a surplus. The plan was drawn so as to move workers from abundant sections to scarce sections by way of transfer and hiring.

Table 2－1 Proposal as to transfer of workers, May 1956

Page 1

There are 301 workers who are in short supply

Department	Mill (section)	Fixed Number	New Fixed Number	Change In Fixed Number	Present Number	Number In Need	Reason
Control Department The Third Section	Technology	73	73	0	69	1	(A)
	Shape Check A	178	178	0	173	3	(B)
	Shape Check B	243	251	+8	234	17	(C)
	Total	494	502	+8	476	21	
Iron Making	B.F. Repair	206	206	0	78	1	(D)
	Higashida B.F.	175	175	0	173	16	(E)
	Higashida Blowing	56	56	0	55	3	(E)
	1st Iron Making	503	571	＋68	498	73	(E)
	Higashida Coal Washing	123	127	＋4	120	4	(F)
	Kukioka Coal Washing	93	95	＋2	93	2	(F)
	Total	1156	1230	＋74	1017	99	

Total		5,762	5,882	＋120	5,444	301	

(A) Replenishment (To restock the loss of workers due to retirement, quit or other reasons)

(B) The cause of the shortage occurred previously and shortage has been carried over.

(C) Inherited shortage, increase in production and replenishment.

(D) Replenishment

(E) Preparation for the start of No.5 B.F.

(F) Start of the washing operation

Page 2

There are 301 surplus workers

Department	Mill (section)	Fixed Number	New Fixed Number	Change In Fixed Number	Present Number	Number In Surplus	Reason
Control Department	Material Check	118	116	－2	118	2	
Iron Making	2nd Iron Making	601	518	－83	596	86	(A)
Shape Steel	Line Steel	9	4	－5	90	86	
	2nd Middle Size	185	108	－77	178	71	(B)
	Total	194	112	－82	268	157	
Steel Plate	2nd Cool Roll	111	108	－3	111	3	(C)
	Tinplate	451	380	－71	422	45	(D)
	Total	562	488	－74	533	48	
New hiring						6	
Total		1708	1463	－245	1745	301	

(A) Stop Operating No.2 Blast Furnace

(B) Change from two shifts to one shift

(C) Change from four shifts to three shifts

(D) Reduction in production, return of the temporary help

Page 3

A Part of the Proposed Adjustment Measure

Mills sending workers → / Mills accepting workers ↓			Control Department	Iron Making	Shape Steel		Steel Plate	
			Material Check	**2nd Iron Making**	Line Steel	**2nd Middle Size**	2nd Cool Roll	Tinplate
			2	77	86	71	3	45
Control Department	Technology	1	1					
	Shape Check A	3			3			
	Shape Check B	17			3	7		7
Iron Making	B.F. Repair	1						1
	Higashida B.F.	16				**16**		
	Higashida Blowing	3				3		
	1st Iron Making	73		**73**				
	Higashida Coal Washing	4		4				
	Kukioka Coal Washing	2				2		

(1) Table 2-1 is taken from a document submitted to the central committee of Yawata Trade Union, 1956.5.12.

(2) Page 3 shown here is only a part of the original page three. In the original new hiring is listed along with mills sending workers.

It will be observed in the page 3 that in some cases transfer took place between the departments which were supposed to require different kinds of skill. For example,

Higashida Blast Furnace Mill was to draw 16 new members from the Second Middle Size Shape Steel Mill. Iron making and production of shape steel required different kind of knowledge, manual dexterity and judgment .In shape steel mills workers were mostly engaged in handling roll-machines to produce various types of shape steel. The process taking place in a shape steel mill might be called mechanical one. Skills required there are mostly concerned with the way to handle the machines. In contrast, in the blast furnace mills, the production process did not so much depend upon the handling of machines. Workers controlled the process mainly by way of accelerating or restraining the chemical reaction. Then the production process at blast furnaces might be called chemical or metallurgical. The highly valued skill was not manual dexterity but judgments made by workers as to the condition of metal in chemical process.

The transfer of 73 workers between the first iron making section and the second iron making section is apparently different in character from the case we have just described. At that time the number two furnace of the second iron making section was scheduled to stop operating and instead the number five furnace of the first iron making section was to start. Since skill required in both sections were nearly identical, it might not be wrong to say that the workers transferred were expected to perform the same kind of operations.

We have observed the two different ways of transferring workers. One is to transfer workers between mills requiring the same kind of skill. The other is to transfer workers between mills requiring the different kind of skill. In the latter case skill specific to the sending mills to which workers originally belonged were not useful in the receiving mills to which they were transferred and as a result specific skill of workers acquired by working in the former mill would lose its value.

If the second type of transfer prevailed to some extent, we cannot safely say that specific skill was so valued in Japanese steel works that management paid utmost attention to the formation and accumulation of specific skill. To the extent transfer between the mills requiring different sort of skills took place, the specific skills obtained by workers were to become useless.

It is important to notice that type of transfer which took place between the Higashida Blast Furnace and the Middle Size Shape Steel was not unusual in the Yawata Steel Works. There are some reasons why this type of transfer occurred so often. The most obvious reason is a changing market conditions. Steel Works produced wide variety of products such as rail, pipe and sheet steel. The demand for each product changed differently. It was usual for a group of mills to become so busy that they were in need of extra workers, while other mills had a lot of workers to spare. The

discrepancy of this kind called for some adjustments in manpower policy. An easy answer to the problem was to transfer workers from one mill to another.

In addition to the adaptation to changing market conditions, the period we are concerned with saw a great change in the production method. With the advance of technological innovation, a certain field of work became obsolete and was doomed to be abolished, while new types of job were being created. The change from open hearths to converters, the introduction of continuous casting and extensive use of truck instead of railways as a main device of transportation were well known examples of innovation taking place in the 1950s and 1960s. If management tried to give employment security to those workers who became redundant as a result of innovation, they had few choices. Sometimes they stopped hiring new workers and transferred redundant workers to other sections. In other cases, when the demand for workers exceeded the supply of workers within the Steel works, management transferred workers while hiring new workers at the same time.

Transfer of workers has been closely connected with the formation of the so called long-time employment system in the Steel Works. It is important, in this context, to notice that, once the employment security was promised to workers, management give utmost effort to secure employment for workers even at the expense of destroying the valuable asset of specific skill of its workforce. In this sense the extensive use of transfer has been a testimony to the fact that the importance of skill has been limited by the formation of the long-time employment system.

3 The personnel policy and transfer of workers in Yawata Steel Works in the pre-war period

The method of transferring workers from one mill to another had developed over long years. Several managerial practices affected the formation of this method. The emerging policy of long term employment helped establish the practice of transferring workers. And the policy of fixing the number of workers each section could employ gave the system of transfer more complicated character.

Fixed number of workers In the early days of the Steel Works, the manager of each mill was given a responsibility to decide the number of workers to be employed in his mill. Then, in the 1920s, the personnel section of the Steel Works began to assume more responsibility for the number of workers of each mill. And by the mid-1930s the personnel section, in cooperation with mill managers, was able to decide the fixed

number and impose it on each mill.

It is interesting to notice that there are no evidence showing that the decision over the fixed number was founded on the Tayloristic motion and time studies. Probably officers at the personnel department with the help of mill managers relied on the past experience as a guide to the adequate number of workers each mill should have.

In accordance with the control over the fixed number, the personnel department also began to assume responsibility over selection and hiring of workers. After the Second World War, it became usual for a change in the fixed number to take place prior to the transfer of workers. When the fixed number in a section was increased, management had to decide whether they would hire new workers or have recourse to labour transference methods such as transfer of workers and temporary help. It might be safely assumed that, with increasing control over manpower adjustment, the personnel department started exercising influence over transfer of workers even in the pre-war period.

Long-Term Employment The mandatory retirement age of workers was fixed as 55 years old in 1900. Although it is not clear yet whether management had a definite policy of keeping each worker until his retirement age, we are able to observe a tendency toward keeping workers long, possibly until their retirement age throughout the pre-war period. In 1924, being faced with a severe financial problem, the Government carried out the retrench policy. As a governmental business, the Yawata Steel Works also tried to cut the expenses. At that time, the Director General of the Steel Works promised to the representatives of workers that management would not seek any dismissal of its employees.

The policy of no-dismissal was not established as a binding policy in the pre-war period. In 1927 and 1931 the management was obliged to have recourse to the large -scale dismissal of workers. Except for these emergencies, top officials of the Steel Works tried to abide by the emerging long term employment system.

There are some evidence showing that transfer of workers from one mill to another took place in the 1900s. In 1902, one year after the start of the whole operation, due to some technical difficulties, they stopped operating the blast furnaces and moved workers working there to other sections. In other cases, the stoppage of machinery due to accidents, scheduled repair and business slack made it mandatory to move workers temporarily to other mills.

The table 3-1 shows that one of sheet steel mills had two different fixed numbers, each corresponding to the type of shifts in operation. When the change from three shifts to two shifts took place due to business slack, some of workers became redundant.

Unless those workers were ordered to do something like cleaning of machinery, they had to be given work outside of their mill.

Table 3-1 The fixed numbers of workers in one of sheet steel mills in 1929

Section	Three shifts	Two shifts
Roll	50	34
Heating	22	16
Cutting	52	36
Adjustment	12	11
Motor	15	11
Shaving	14	13
Miscellaneous	33	30

(1) Tateshi Mori, "Labour Management in Yawata Steel Works from 1890s to 1930s", *The Journal of Economics (Keizaigaku-ronsyu)*, Vol.71, No.2, 2005, in Japanese.

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4 The transfer of workers and the joint consultation over the manning policy after the Second World War

In the late 1940s, the Yawata Steel Works was confronted with a severe shortage of labour. The management had to recruit more than 20, 000 workers in order to go back to normal operation. The table 4-1 shows that, while they recruited a lot of workers, there occurred a mass resignation at the same time.

Table 4-1 The number of hiring and resignation from 1947 to 1951

	Hiring	Resignation
1947	3,083	4,779
1948	9,882	2,387
1949	2,185	1,572
1950	3,569	1,603
1951	1,545	1,442

(1) A document of the Yawata Steel Works, 1959.8.1

As the table 4-2 shows, along with the hefty recruiting drive, a large-scale transfer

of workers from one section to another happened quite often.

Table 4- 2 Transfer in Yawata Steel Works in August, 1949 (a part of list)

Section to which workers were transferred	Jobs to which workers were transferred	Numbers of workers	Department from which workers were transferred, or other sources
Nishida Transport	Handler of rail shunting	15	Demobilized and newly hired 22
Higashida Transport	Handler of rail shunting	7	
Vehicle	Operator of steam crane	11	Steel making 9、Shape Steel 31、Repair 3、Demobilized 2
	Driver of Steam Engine	10	
	Boiler-men	21	
	Conveyer	3	
Railway Engineering	Finishing Forger	3	Steel making 1、Shape Steel 1（both have experienced forging）、Chemical 2、Demobilized 1
	Switch yard operators	2	

Joint Consultation over Transfer of workers The most notable characteristics of the post-war transfer of workers was that it was closely connected with consultation with the union.

Soon after the war, the emergent trade union, whose members were composed of almost all the rank-and-file employees of Yawata Steel Works, tried to impose the limitation on the managerial control of the enterprise. The union demand of so-called 'labour right' required the management to follow the decisions of joint consultation in which the union had an equal representation with management. The important matters such as future business plans, financial decisions and labour conditions were to be included in the agenda of joint consultation. From 1946 to 1949, the company was obliged to accept the union demand and as a result joint consultations became the most

influential organ in the Steel Works. Transfer of workers was one of the topics which were intensely discussed between the management and the union at that time.

After a brief period when the collective bargaining and the joint consultation stopped functioning due to the decision of management not to renew the current labour agreement, management and the union reached new labour agreement in 1951 in which the union accepted the managerial right to implement policies without consent of the union. There seemed to be no barrier to the power of the management, the only thing management had to do being to consult with the union. There was no obligation for management to listen to the claims of the union or to reach a compromise with the union in the joint consultation. The post-war union demand of the ‘labour right’ to the decision making seemed to be totally denied.

In the industrial relations which took place after the conclusion of the agreement in 1951, it turned out that management continued to pay attention to the union demand. Although the management kept on saying that they would not be subjected to union demands, the management did not implement a policy to which the union was severely opposed. In the case of transfer of workers, management made every effort to get the consent of the union. The rationale lying behind the managerial attitude was that the management expected the unions to control rank-and-file union members who tended to become radical in their thinking. The management had to strengthen the power of union leaders by giving them concessions in some area like transfer of workers.

Joint consultation over the transfer of workers offered a good opportunity in which both sides could reach an agreement. With the consent of the union, management could easily persuade individual member of the union to obey the order of transfer. In the 1950s, the officials representing the management side and the union leaders met twice a month to discuss the manpower plan of the coming month. This meeting, up until today, constitutes the pivot around which the machinery of industrial relations rotates.

5 The transfer of workers in the 1950s

In the depression following the armistice of Korean War, the Yawata Steel Works stopped recruiting workers. At that time, the government saw in the export of steel a chance of economic recovery. In order to increase steel export, the management had to find ways to cut production costs so as to be competitive. The planned massive investment in equipment was regarded as one of those cost-cutting methods. The

personnel department hoped to help cut costs by carrying out the more efficient allocation of man-power.

Table 5-1 Fixed number and present number of employees from 1951 to 1955

	Fixed Number	Present Number	Working Number	Steel Products
1951.4	30,332	29,198	28,310	106,651 tons
1952.4	29,341	28,896	28,087	133,038
1953.4	28,414	27,775	26,955	128,187
1954.4	27,099	26,814	26,173	126,949
1955.4	25,865	25,883	25,244	150,203

(1) A document of the Yawata Steel Works, 1959.8.1

Table 5-2 Fixed number, present number, hiring and resignation from 1955 to 1957

	Fixed Number	Present Number	Hiring	Resignation
1955	25,885	26,001	549	839
1956	26,162	25,672	1,292	844
1957	26,146	26,160	1,103	852

(1) A document of the Yawata Steel Works, 1959.8.1

(2) in this table resignation includes retirement

The table 5-3 shows the extent to which the methods of transfer and temporary help were used in the Yawata Steel Works. It is apparent from this table that transfer within the department which excluded transfer within the same mill was the method mostly made use of by management.

Although most of transfer occurred in the same department, in 1954 about one third of transfer was carried out between departments. And the majority of temporary help took place between departments.

Table 5-3 Transfer (Haiten in Japanese) and Temporary Help(Ouen in Japanese) in Yawata Steel Works １９５４－１９５６

	１９５４	１９５５	１９５６
Transfer within the Department	１２５７	９７２	６１９
	67%	62%	75%
Transfer within the Division	２９９	７７	９６
	16%	5%	12%
Transfer among	２６８	５１７	１０８

the Divisions	15.5%	33%	13%
Transfer with in the Works	2 7		
	1.5%		
Total number Of transfer	1 8 6 9	1 5 6 6	8 2 3

Help within the Department	8 1 9	2 5 0 9	1 3 8 3
	40%	44.5%	59%
Help within The Division	8 3 6	1 9 4 3	3 9 4
	41%	34.5%	17%
Help among the Divisions	3 9 3	1 1 7 6	5 5 5
	19%	21%	24%
Total number of Help	2 0 4 8	5 6 2 8	2 3 3 2

(1) The Yawata Trade Union, documents submitted to the central committee, 1956.5.29

(2) In this table, **Department** denotes a managerial unit such as Iron Making Department, Steel Making Department, Transport Department and Maintenance Department. **Division** denotes a group of Departments such as Production Division including Iron and Steel Making Departments, Auxiliary Division including Transport Department and Maintenance Department and Administrative Division.

Transfer between departments in 1954 is shown in the table 5-4. In this table, Iron Making Department sent 28 workers to Shape Steel Department and 8 workers to Steel Plate Department. And Steel Making Department sent workers not only to the production division such as Shape Steel and Steel Plate Departments but also to the auxiliary division and the administrative division.

There might be some possibilities that even in the case of transfer between departments, workers moved were engaged in the same type of job and as a result his specific skill continued functioning in the new environment. Compared with the case of transfer within the same department, however, in the case of transfer between departments, there seems to be less connection between skills required in each mill. Therefore transfer to outside of departments in table 5-3 might be taken as an indication showing the degree of impairment to specific skill owned by each worker.

Table 5-4 Transfer between departments in 1954

	Production Division	Auxiliary Division	Administrative Division	

	Shape Steel	Steel Plate	Power	Engineering	Adm. 3rd div.	Business Adm.	Research Lab.	Total
Iron Making	28	8						From Produciton Division 358
Steel Making	47	58	15		8		14	
Shape Steel		98	4					
Steel Plate	10				3			
Chemical	18	10	5		12		20	
Trans-Portation		66	10	14	33	14	4	From Auxiliary 183
Engineering		20	10		7	4	1	
Business Adm.		18	10		9		7	From BA 44
Total	To Production Div. 381		To Auxiliary Division 68		To Administration Division 136			585

(1) The Yawata Trade Union, documents submitted to central committee, 1956.5.29

Table 5-5 Temporary Help between departments in 1954

	Iron Making	Shape steel	Steel Plate	Power	Engineering	Adm. 3rd div.	Business Adm.	Research Lab.	Total
Steel Making	9	174	359	31	28	107	21	15	1156
Shape Steel			187	10					
Steel Plate		107							
Chemical	10	66	6			26			
Trans-Portation	6	9				4			73
Constraction		10					7		
Engineering			11			26			
Total	954			69		206			1229

(1) The Yawata Trade Union, documents submitted to central committee, 1956.5.29

The table 5-6 is interesting in terms of the damage made by transfer of workers to specific skill. Although the exact meaning of classification A, B, C, is not fully clear, it is obvious that, among 1037 workers transferred, 289 workers were classified as belonging to category A. This means that less than one third of the transferred workers were engaged in the same specialty.

In the table 5-3, ratio of transfer within the same department was 67% in 1954. The ratio of transfer to the same specialty in the table 5-6 was only 28%.

Table 5-6 Classification of Transfer according to their specialty in 1954

	A		B		C		Total
Roller	59	27.6 %	28	13.1 %	127	59.3 %	214
Shearer	22	15.2 %	20	13.8 %	103	71.0 %	145
Checker	33	27.3 %	32	26.4 %	56	46.3 %	121
Hearth Operator	43	39.1 %	13	11.8 %	54	87.0 %	110
Steel Making Operator	8	8.0%	5	5.0 %	87	87.0 %	100
Repair-man	32	33.3 %	12	12.5 %	52	54.2 %	96
Crane Operator	43	46.2 %	34	36.6 %	16	17.2 %	93
Motor Driver	27	31.4 %	37	43.0 %	22	25.6 %	86
Finisher	22	35.5 %	5	8.1 %	35	56.4 %	72

(1) A document of the Yawata Steel Works, 1959.8.1

(2) Roller:圧延工、Shearer:剪断工、Checker:整理工、Hearth Operator:操炉工、Steel Making Operator:製鋼工、Repair-man:整備工、Crane Operator:起重機運転工、Motor Driver:電機運転工、Finisher:精整工

(3) A : transfer to the same specialty （同一職種）
B : transfer to another specialty（専門外職種）
C : transfer to general jobs（一般的職種）

6 Transfer of worker as a way to rationalize the organization in the first half of 1960s

In the late 1950s and early 1960s, management invested heavily in extending the Yawata Steel Works into neighbouring Tobata area. This attempt to extend the steel works was much more like building a new steel works on a new site. And management tried to introduce a new type of production control at Tobata. Up until that time, each mill in Yawata area had retained to certain extent a discretionary power as to the schedule of production. In new Tobata area a centralized system of production control was introduced.

This period also saw a rapid rationalization of the production lines which brought about the more efficient use of manpower. Management made extensive use of transfer of workers within the Works in connection with the reduction of fixed numbers of workers each mill could employ. From September 1959 to August 1960 the Yawata Steel Works needed about 3,900 workers so as to respond to the increase in production and the start of No.2 blast furnace in Tobata. Against this number, the Steel Works hired only 1,611workers, the remaining number being supplied from within.

The Table 6-1 shows that at September 1959 246 workers were supplied from various sources such as 63 workers who were promoted from the status of labourers to workers and 159 workers whose former jobs were out-sourced. Only 20 workers among 246 workers were newly hired. When much needed workers were supplied as a result of outsourcing and rationalization in the production process, those workers were transferred from their old jobs to new jobs. Although there is no mention about transfer in the table 6-1, each number suggests that a lot of transfer took place in the Steel Works at that time.

Table 6-1 Manning from September 1959 to August 1960

	Workers needed	Promotion of labourers	Outsourcing	Rationalisation Of Produciton	Abolishion of Chemical D.	New Hiring
1959.9	246	63	159	4		20
59.10	211	75	22	8		106
59.11	179	167	12			
59.12	279	172		8		99
1960.1	445	409	36			
60.2	158		23	71		64
60.3	78		39	9		30
60.4	378		12	2	119	240
60.5	83		27	4		52

60.6	451		99	15		337
60.7	834		209	318		307
60.8	587		87	144		356
Total	3,924	886	725	583	119	1,611

(1) A document of the Yawata Steel Works, 1960.10.1

The reduction of fixed number was pursued, with the help of the technological innovation such as an introduction of large-scale computers, in order to make the production line more efficient. Some of the redundant workers produced by the rationalization of the production lines were to be sent to a newly-build steel works in Sakai near Osaka and later on to the Kimitsu near Tokyo. The manpower policy of the company had to be modified so as to be applied not only to the Yawata Steel Works but also to those new steel works, and transfer between plants(steel works) was to play an important role in the pursuit of the growth of the company.

Management thought technological innovation taking place in Tobata would change drastically the character of work in the production lines. In the old mills in Yawata they relied much upon "manual labour"of workers, while in the new production lines in Tobata where automation was eagerly pursued "mental labour" would become a dominant type of work, the management claimed. In the managers' thinking, a new rank of workers at the shop-floor should be founded on the evaluation of skill and ability required in each job rather than on the experience of workers. Job evaluation was the method which managers thought to be the most fitted to establish a new order in the mills. Not only wages but also various topics of personnel policy such as hiring, training and promotion should be based on job evaluation.

It was insisted by some officials of the personnel department that fixed number of workers were also to be assessed by the methods of standard work and job evaluation. Despite some attempts to introduce scientific management methods, up until that time, changes in fixed number made by the personnel department were mostly based on the past experience. By introducing the industrial engineering methods, the whole process of assessing the necessary number of workers in each production line was expected to be more "scientific". As a preliminary to extensive job evaluation, management carried out the review of fixed number of each mill from 1959 to 1960.

Trade union and manpower Policy As we have already pointed out, transfer of workers was carried out with the consent of the Yawata trade union. Following the management's review of fixed number, the trade union tried to review the manpower situation by themselves. They asked some branch officials of the union to look into the

manpower position of several mills and to collect the opinions of the rank-and-file trade union members as to the manpower policy of the company. One of the purposes of the investigation was to gather information concerning substitutes who would replace workers when workers were absent from work. With the information about manpower position and substitutes, the union intended to demand the increase of substitutes and by so doing tried to make it easier for workers to take holidays.

7 The oil crisis and the employment adjustment

The oil crisis, especially crisis of 1973, had a deep impact on the business of manufacturing sector. The order for shipbuilding which had climbed up until 1973 had declined drastically after the crisis. The demand for steel products also declined in an unprecedented scale. The crisis hit the core of the post-war Japanese industrial relations, too. The employment security guaranteed by the firms became vulnerable. In order to avoid the disastrous massive dismissal of employees, firms used the various methods of employment adjustment.

It had been ordinary for firms facing the unfavorable business conditions to stop asking over-time and then quit hiring not-newly-graduated applicants. In addition, firms use to make use of transfer of workers as a part of employment adjustment.

The table 7-1 shows that, in the summer of 1975, 67% of the manufacturing firms adopted some kind of employment adjustment. Along with stopping hiring non-new- graduates and reducing over-time work, firms surveyed used transfer and loan of employees to other firms as methods of adjustment. The table shows that large firms compared with smaller firms employed the methods of employment adjustment more extensively.

Table 7-1 Employment Adjustment Policies among Japanese Manufacturing Firms

(%)

Size of Firms	Periods	Firms with Policies	Stopping Hiring Non-New-Graduates	Transfer & Loan	Reduction of Over-time Work
Total	1974.7-9	43	28	6	25
	1975.7-9	**67**	**46**	**21**	**47**
	1976.7-9	31	21	11	16

	1977.7-9	34	23	14	19
	1978.7-9	28	18	12	15
Employees 1000 & over	1974.7-9	52	37	9	30
	1975.7-9	**79**	**60**	**32**	**61**
	1976.7-9	49	35	22	29
	1977.7-9	52	37	26	32
	1978.7-9	45	29	25	26
Employees 300-999	1974.7-9	49	34	7	33
	1975.7-9	**69**	**51**	**21**	**45**
	1976.7-9	27	20	9	13
	1977.7-9	30	21	11	15
	1978.7-9	25	17	7	13

(1)Ministry of Labour, *Report on the Labour Economic Trend* (*Roudou Keizai Dokou Cyousa*) ; Kawakita, T., *Sangyou-hendou to roumu-kannri* (*Industrial Change and Labour Management*) , p.204

(2)Multiple answers permitted

(3) Total means the Total Average of All manufacturing firms

(4) Employees 1000 and over means firms employing 1000 or more than 1000 persons, while Employees 300-900 means firms employing

As the table 7-2 shows that, among the types of transfers and loan, transfer of workers within a firm occupied smaller proportion compared the loan of workers. But in the history of transfer of workers, the period after the oil crisis was important in the sense that for the first time transfer of workers in different firms took place simultaneously.

The loan of workers to other firms was in a sense an extension of transfer of workers within a firm. For various reasons, it was usual for companies to come togather as a group. In many cases, a powerful parent company controls subsidiaries in the group. From the late 1970s, companies, especially parent companies having many subsidiaries, started utilizing the group network through which workers of parent companies were loaned to subsidiaries as a way of keeping their workers in employment. If we regard a group of closely connected companies as one company, loan of workers was not so different from transfer of workers within firms.

Table 7-2 Percentage of adjusted employees according to the types of transference

(%)

	1975	1976	1977

Temporary Help	1.1	1.0	1.8
Transfer within a Firm	1.3	1.6	2.8
Contingent	0.2	0.3	0.6
Loan	3.0	3.8	8.1
Transfer to another Company	0.2	0.3	1.8
Total	5.0	5.8	12.6

(1) Ministry of Labour, *Report on the Labour Economic Trend* (*Roudou Keizai Dokou Cyousa*) ; Kawakita, *op.cit.*, p.206

(2) Year in this case denotes fiscal year. For example, 1975 means the period from 1975.4.1 to 1976.3.31.

8 Conclusion

We have seen that even if the workers had accumulated a large amount of specific skill there was a limit to the use of the skills. Management had to move workers from one production line to another, from one mill to another, in order to adjust the changing labour requirement and to maintain the long-term employment practices. In some cases a worker transferred to a mill found that his accumulated skill was not useful any more in his new shop-floor.

Those practice moving workers from one shop-floor to another constituted a part of ‘flexible management’ style which has been much praised in these days. But so often is it forgotten that being flexible sometimes contradicts the maintenance of operative skill.