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The Japanese innovation system and its transferability:

a Hypothesis of Hybridization in Canada

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Summary

Over recent years, there has been much interest in the Japanese innovation system, as well as the Japanese HRM (Human Resources Management) policies and practices which appear important in terms of fostering innovation. This has led many researchers to wonder if the diffusion of these practices had spread beyond the Japanese border, particularly to Canada, where there is much recent interest in different innovation systems. This article starts by reviewing the different dimensions of the Japanese Innovation system, highlighting the elements which appear pertinent as well as most original, while simultaneously being possibly transferable to regional systems of innovation in Canada. It then sets out to assess if some dimensions of the Japanese model pertaining to HRM have been retained in Canada, and how emulators of these practices compare with Japanese firms.

Introduction

Innovation systems and HRM policies compatible with successful innovation systems, that is HRM practices that stress the importance of quality and reliability throughout a network of firms, as they do in Japan, are of increasing interest for many advanced economies (Schonberger, 1994). For traditional Fordist organizations, requirements for upgrading human resources were not as important; division of labor was in fact minimizing human contact and training needs, as skills to operate single task operations were minimal. The sociotechnical school challenged this view, indicating that labor will in the end be demotivated by the absence of a social context in workplaces. However critical and important the findings of the Tavistock institute, the sociotechnical approach has not diffused widely (Matthews, 1994). The leading motivation for change came from the successes of Japanese networks of firms, challenging at first the heart of manufacturing: the automobile industry (Womack *et al.*, 1992). What has been known as Japanese management practices, networks and innovation system has been associated with a different approach to human resources as well as to innovation. The need to involve workers in production problem-solving, in the different firms of a network, and delegating responsibility for quality standards as well as seeking participation for productivity improvement has led to view personnel practices as a key element of competitiveness of the Japanese innovation system and Japanese firms in particular (Kenney and Florida, 1993). In this context, more and more nations and firms look into this model, even while the Japanese financial system has known some difficulties, searching to renew their competitive advantage in the context of the renewed interest in innovation systems. The Japanese model of HRM is often seen as one of the most innovative and competitive for networks of firms, and many countries and firms have thus been interested in emulating the Japanese model.

Our paper looks at how these elements have been replicated in the Canadian setting by the Japanese firms themselves and by Canadian firms. This paper is based on a survey which has been undertaken by the authors, some elements of which we will present here after having gone through the relations between Japanese HRM and its innovation system. We will thus first briefly go over the main elements of the Japanese innovation system, then present the essential characteristics of the Japanese HRM and work organization that appear essential to the functioning of the Japanese innovation system, and finally present some results from our research on Japanese transplants in Canada and Canadian (in fact Québec) firms.

1. The Japanese Innovation System

The Japanese system of innovation having been recognized as particularly successful, we will highlight the main elements of this system, before we look at the possible application of these elements in Japanese transplants in Canada and in Canadian firms.

The Japanese system of innovation is seen as composed of four elements: the central government, the organization of firms between themselves, some social innovations and some educational innovations. We will insist more on the two last aspects, which are of more interest in relation with regional systems of innovation, which are of interest to us in this conference.

As for the Central government's role, it is rather well known and has less direct impact for regional systems of innovation; let us simply recall that this usually refers to the infrastructures offered, to the public investment in R & D which facilitate diffusion, but more particularly in the Japanese case, to the informal consultations between the State and companies via MITI and other similar organizations, and maybe foremost the exchanges of personnel between MITI and various companies. These various elements can surely be of interest for the Canadian and Quebec contexts, but they are less pertinent at the regional level *per se*.

As concerns the organization of firms, this mainly refers to the Japanese Keiretsu (conglomerate or network of firms); cooperation between firms is stronger in Japan than in most other nations, although cooperation with universities is on the contrary somewhat lesser in Japan than in the US. However, some authors consider that cooperation with universities is underestimated in Japan, while they consider that the role of MITI is often overestimated (Odagiri and Goto, 1993).

We share the view that the two first dimensions (i.e. the State and firms' organization) are often overestimated, while the two latter are underestimated and particularly important for regional systems of innovation or regional networks of firms. This explains why we chose to stress the two last points.

As concerns the social innovations related to the internal organization of firms, this is of more interest to us here, given its importance in the context of the Innovation Economy and systems of innovation. This generally refers to what is known as « reverse engineering », a reconstruction of various products which apparently favours innovation - at least incremental innovations- in Japanese firms. In this perspective, Japanese firms tend to integrate more fully marketing and production management, as well as R & D; this permits simultaneous horizontal exchanges between these otherwise separate services. There is more collaborative work between engineers, management and workers and due to this, « lead time » between conception and design of products and their arrival

on the market is reduced considerably, which gives an important competitive advantage to the J firm. To a certain extent, the whole firm and often the whole network of firms participating in the same group (Keiretsu) is seen as an R & D lab in terms of developing better processes and products (Kenney and Florida, 1993). Indeed, there are frequent interactions between the firm and its' suppliers and subcontractors, even as concerns product development, processes, and various aspects of innovation. Let us mention that this typical Japanese system does not necessarily concern all Japanese firms, but that it should be seen as an ideal-type, as has been highlighted by various authors (including Aoki, 1989; Dore, 1973) This system is of course associated with a particular employment system and HRM system, which is seen as essential to the innovation system as it stands, and to which we will turn later on.

This offers the J firm important advantages not only in terms of economies of scale, but more importantly of scope, advantages that can advantageously compete with those obtained with vertical integration within large US or Western firms. The decentralization of Japanese firms and their privileged relationship with unique suppliers who are part of their network gives them more flexibility and more long term perspectives, comparatively with the North American firms, at least as their traditional way of functioning is perceived.

The last element of the Japanese Innovation System is related to some characteristics of the educational and training system, here again associated with the employment system which has come to be known as the typical Japanese system. Let us first mention that the Japanese firms are known for hiring workers with a good basic education, not necessarily workers specialized for the work they will be doing in the firm and its network throughout their career. This facilitates problem resolution and general maintenance within teamwork, as well as participation in the continuous improvement process and quality insurance, two renowned dimensions of the Japanese innovation system. This also permits future adjustments and change within the firms and their networks.

The firm and its network is responsible for training workers on the job for the specific skills required by their jobs. There is a strong integration of training with the process of innovation, be it product or technological process innovation. Knowledge of production processes by the workers facilitates horizontal exchanges of information. In a sense, the Japanese innovation system is seen as a « systemic » approach to production at all levels, as management is not alone in knowing and mastering the whole production process, workers of all levels participating in the innovation system.

It seems in fact that exchanges of information which are useful to innovation and quality are favoured by the fact that worker statuses tend to be equalized, that wage differentials are not as high

as in the US for example. This reduces obstacles to cooperation on the shopfloor as well as within the network of firms.

There are different views on what is more efficient for innovation development and diffusion, with two main views dominating. Some, amongst which Aoki, highlight the importance of work organization, that is the collective, cooperative nature of work in opposition with strong hierarchical division of labour in North America and many other advanced nations. Others, amongst which Lundvall (1988), highlight the importance of interactions between users and producers, which are highly developed in Japan, cultural and geographic proximity being important factors for these interactions to exist in any country or region. Lundvall highlights the fact that important interactions within the national borders tend to strengthen the National system of innovation and this could possibly be transferred to the regional perspective as well. This is certainly important for what has come to be known as the Japanese innovation system, and the possibility of importing or hybridizing the system. In any case, internal work organization and interactions between firms are both to a certain extent intertwined in the Japanese innovation system and both favour exchanges of information that are conducive to innovation. According to many authors, these exchanges of information would not be possible without a specific HRM system, and most particularly without a long term employment relationship and cooperative workplace practices. These are elements of the Japanese HRM system to which we will now turn, elements which are characteristic of the Japanese system and strongly differentiate it from the traditional North American organization (Tremblay and Rolland, 1998).

2. The Japanese Model of HRM and Work Organization

Three elements are fundamental in the J firm's HRM (Human Resources Management) and work organization. First, the flexible organization of production characteristic of the J firm depends on the multi-skilling of workers who can be assigned to different tasks at different times depending on the level of orders and the work that needs to be done. Secondly, "Kaizen" involves the continual search for improvements that allow quality to be improved and costs to be reduced. The third key element, Just-in-Time, avoids the waste associated with the "Just-in-Case" system within firms and ties together the firm as a complex whole; this element is prolonged in the network of related firms and is thus important for the Japanese regional systems of innovation. Long term employment is often seen as a prerequisite for these three aspects, thus representing a forth pillar of the system.

As concerns long-term employment in Japanese firms, let us mention that this only covers about one third of the labour force, that working in large firms, and the situation is not always as

positive in small- and medium-sized companies. Thus, the superior performance of the J-firm is obtained at the cost of a degree of stress and inferior working conditions within small- and medium-sized subcontractors organized into a network dominated by the large J-firm (Dedoussis and Littler, 1995 and Demes, 1992). In the following discussion of the Japanese model of human resource management, we focus more particularly on the conditions which are characteristic of large J firms, those that have come to be seen as the typical J firm as presented by various authors.

The Japanese model of human resource management is closely related to the organization of production. As will be seen, recruitment, training, compensation and participation policies are all aspects of human resource management which contribute to the success of the Japanese style of production organization and innovation within the J-firm, and which many now see as the typical HRM strategy for the New Information Economy.

2.1 Recruitment Policy

The process of recruitment in Japan has been compared to the study of a large investment plan. The firm concentrates on verifying whether or not the candidate conforms to the culture of the firm, not so much on testing specific knowledge or skills. This type of practice is due to both a long-term employment relationship in which there is little likelihood of employees leaving the firm once they are hired, and to the type of skills sought. Because specific training is provided by the firm, basic education is the main recruitment criterion. Since the firm's internal market is used to fill vacancies created by promotions, recruitment policy also aims at evaluating the candidate's capacity to learn within a process of continuous training. Thus, recruitment is carried out in relation to jobs rather than to well defined tasks. To evaluate candidates, firms maintain contact with professors who participate in pre-recruitment. The recruitment policy of large Japanese firms is distinctive in the sense that it promotes homogeneity. It comes from a need for cohesiveness within firms trying to recreate a family atmosphere based on trust (Bernstein, 1988). Typically, for entry-level positions at the bottom of the salary scale, recruits are hired at the same place and at the same time and come from the same age (and gender) group.¹ Recruitment homogeneity appears to promote team spirit and resolve a certain number of communication problems or "pre-management" problems (Whitehill , 1991: 83 and Murayama, 1982: 101). At the time of recruitment, evaluation of social skills appears even more important than the candidate's knowledge. As will be seen, this is consistent with wage, promotion and training policies.

2.2 Promotion and Compensation

Within Japanese firms, career progress is slow and based on an informal, long-term evaluation of the employee. The *nenko* system of promotion, based on seniority, is very widely used.² Starting salaries are quite low and progress with seniority. Thus, older employees are relatively overpaid, which explains the retirement age of 55. At this time, sometimes a little before, workers will be transferred to other firms of the network, generally smaller firms which pay a slightly lower wage. In recent difficult times, this process of *Shukko* (transfer of workers to related firms in the network), has been quite extensively used by large typical J firms in order to reduce costs without too much redundancies, while preserving some form of stability of employment for workers. This system applies to both blue-collar and white-collar workers and the union structure called enterprise unionism, which includes all of a firm's employees, is conducive to the negotiation of salary scales.³ Compared to other countries, wage gaps in Japan are small and tend to favour egalitarianism and participation of all in various activities like quality circles and others.

This egalitarianism of the wage policy in Japanese firms is characterized by the *nenko* system of slow salary advancement based on age (*nen*) and years of service (*ko*) in the firm. In fact, this is a system of intergenerational transfer and some people believe that this practice is an adaptation to the Japanese cultural requirement of respect for elders.⁴ However, this system has the effect of decreasing stress when workers first arrive in the firm, and it tends to make external mobility on the labour market less attractive because all new employees begin at the bottom of the salary scale. The *nenko* system allows some separation between responsibilities and salary scales, thus favoring initiative and participation in innovative processes.

Some researchers trace the origin of the *nenko* system to the response of management in the 1920s to a very tight labour market. By granting continuous annual salary increases, firms were attempting on the one hand to decrease the attraction of unions and on the other hand, to keep qualified employees (Nitta, 1994). However, it was only after the war, when union organizations demanded equal status between white-collar and blue-collar workers, as well as job security, that this system became widespread. These demands shaped the structure of enterprise unionism and subsequently facilitated opportunities for mobility within an internal job market.⁵ Seniority-based promotions increase employees' attachment to the firm (and not to the job) and thus make expensive training profitable. For an employee, leaving a job would mean the loss of accumulated seniority and a return to the bottom of the salary scale in another firm.

However, the distinctive feature of this system, compared to most other countries, is that the blue-collar career path resembles that of white collar workers (Koike, 1987). The compensation and promotion system is consistent with a work organization based on a long-term relationship and on multi-skilling of employees with little specialization. Thus, employees are likely to experience vertical as well as horizontal job rotation, thereby acquiring skills through experience. If salary progression for Japanese blue-collar workers is higher than elsewhere, one explanation is that skills acquired through experience are compensated more by firms and networks of firms or *Keiretsus*. These elements appear quite crucial to the Japanese innovation system and are surely of interest for those interested in developing regional or national systems of innovation in other countries, including Canada. It is difficult to evaluate whether any of these elements can be transferred however, a subject to which we will return later on.

2.3 Employment Policy and Training

As we mentioned previously, long-term employment involves only about one-third of the labour force, essentially workers in large firms, which in fact are the model for the J-firm. Employees

in smaller firms of the network or Keiretsu have traditionally had a relatively continuous relationship, although somewhat more at risk than those in the firms dominating the network, who often send older workers to the smaller firms of the network. These smaller firms do not all have this opportunity. Thus, job security decreases in an inverse proportion to the size of the firm. Until employees reach the age of 55, they are called upon to carry out different tasks for the same employer. In the case of rationalization, the jobs of women and temporary workers are cut, working hours are rearranged and the work force is moved around. Thus, it is rare for a regular employee to be laid off, the main criterion for dismissal being a disloyal attitude towards the firm. Moreover, the law limits the possibility of laying employees off for economic reasons (Sasajima, 1993). Long-term employment is often viewed as a post-war union victory.

Long-term employment and the absence of precise job descriptions encourage the formation of work teams, one of the main tools of Japanese work organization and innovation process. Through teamwork, employees acquire speed in communicating and minimize transaction costs associated with the integration and frequent changing of partners in specialized work. A key element in job satisfaction involves friendship with work colleagues and this, in turn, encourages informal communication and quick adaptation, important factors in greater productivity and information exchange which are vital for innovation.

On-the-job training within work teams encourages the acquisition of general knowledge of the production process as a whole (Koike, 1981). Quality control carried out by workers themselves requires wider skills and responsibilities. Older workers are used as mentors for training new recruits. Quality circles also provide an opportunity for training. Multi-skilling allows workers to detect defects in pieces or products coming from other work stations and to ensure the necessary corrections are made. In our view, these elements are crucial to the Japanese innovation system and could be crucial to innovation systems elsewhere.

Since training is not meant to be transferred from one firm to another, which reduces the possibilities of an "exit" strategy, training and qualifications are thus associated with employees, not so much with a specific job description. Having less specialized but more multi-skilled employees, firms are less affected by absenteeism and can count on production continuity. Long-term employment is thus consistent with the type of training specific to firms that make less use of the external market. At most, firms will use the firms within their network as buffers in both ways, in times of increase or decrease of production, rarely going to the external labor market for temporary

contracts (except in the service sector, which functions quite differently, and will not be discussed here).

2.4 Participation in Decisions

The creativity of both managers and employees is a factor which is often mentioned in the literature on the success of the Japanese model (Leonard and Thanopoulos, 1982) particularly in terms of quality and innovation. Participation in decisions by managers (*ringi sei*) and employees is a means to channel suggestions for improving the production process and facilitating adaptation to new technologies. This obviously requires a good knowledge of the production process but also an employment system that will not turn to head count savings as a result of implementing innovations. These collective decision-making processes have the advantage of stimulating (or simulating according to some authors) participation and informing managers and employees of organizational changes to come, as well as promoting a sense of belonging to the firm. It takes admittedly longer to develop directives that everyone has had the opportunity to influence or comment on, or at least to be associated with, but they are implemented more quickly. The importance of this participatory management system in the firm's success can be seen in its contribution to continuous improvement (*kaizen*).

3. Japanese transplants and Quality-oriented Canadian firms: how close are they to the J firm ?

Research on Japanese firms in Canada has not been extensive comparatively to the UK (Morris, 1994) and has focused on the automotive industry (Huxley *et al.*, 1995; Drache, 1994 ; Robertson *et al.*, 1992; Boyer, 1992). Research conducted in the 1980s shows that adoption of new work organizational forms has spread slowly comparatively to the US (Meltz and Verma, 1993).

Diffusion of the new Japanese (J) production system is seen by many as a necessary requirement to enhance innovation and higher productivity of firms in the context of a search for the development of innovation systems at the regional or national level. The J style of production management implies a series of transformations in the mode of HRM and work organization, as we highlighted earlier. An important aspect of lean production is the quality improvements of products embedded in the production process, which renders necessary the adoption of a new style of workplace (Kochan and McKersie, 1992; Schonberger, 1994). Most studies on the adoption of the Japanese model abroad tend to indicate a partial transfer or hybridization of work practices and

human resources management related to the Japanese innovation system (Da Costa, 1995; Dedoussis and Littler, 1994; Florida and Kenney, 1991; Negandhi *et al.*, 1985; Matsusaki, 1980).

Our study examined the practices of Japanese firms in Canada to determine how much of these practices have been retained, but also how they compare with Canadian firms in general, as the interest for Canadian and Québec innovation systems leads us to question the diffusion of the J-style practices beyond Japanese firms.

The survey conducted thus compares the practices of Japanese firms to a model of the Japanese firm, as defined earlier. As the postal questionnaire is mostly about organization of work and human resources practices, it has been sent to directors of human resources in 271 Japanese firms. To determine whether the hybridization process may have gone as far as to blur the differences between these firms and the Canadian ones, the questionnaire was sent to some 397 Canadian firms. Answer rates on both samples were about 20 %⁶.

The difference between the American and the Japanese concept of quality monitoring and improvement process is said to be a major source of the need to reform the workplace (Betcherman, Leckie and Verma, 1994; Cole, 1993). Total quality management in a decentralized setting (typical in the model of the Japanese firm) would hence be a proxy for identifying firms bearing resemblance with Japanese practices of work organization and employment relations. Canadian firms were thus divided into two different groups according to the quality monitoring process. Besides the Japanese sample, those firms managing total quality in a decentralized manner, giving responsibility of quality monitoring to line workers constitute the second sample (Q). All other firms constitute a third sample (E) that can also be compared to the Japanese sample. This sample, as it has not adopted a total quality process in a decentralized manner, should be closer to the traditional way of managing production and work in North America (the A firm in Aoki's terms).

The questionnaire was divided into three sections: enterprise culture, production and business organization, as well as work organization and human resources practices. The first section was composed of a series of discrete questions on human resources attitudes typical in the American and Japanese practices of recruitment, work organization, appraisal, etc. Respondents had to choose between a set of dichotomous propositions which typified in a positive manner different ways of managing. Examples of these will be given further on, in Table 5. The second section asked about the environment of the firm and the production organization. The last section concentrates on human resources practices of recruitment, training, promotion and work organization.

3.1. Results

First, figures from the production process and the business organization show that Japanese firms are mostly engaged in standardized production, not needing special customized alterations; they are then less driven by diversified special demands (See table 1). The fact is that they are understandably more integrated in the national and international markets than the other firms of our samples. As Table 1 shows, Japanese firms seem to be more technologically advanced and less integrated into a web of sub-contracting, a feature that might impede their capacity to pursue some of Japanese practices related to the typical J innovation system, as this system is strongly related to the networks of firms characteristic of the J organization of production.⁷

Table 1. Aspects of firms of the residual (E), Japanese (J) and quality (Q) sample

Aspects	E	J	Q	total
N	46	26	24	96
# of employees	323	641	642	489
Type of production: continuous	22%	42%	54%	35%
Type of production: demand driven	53%	29%	42%	44%
Standards/non-standard products	58%	89%	61%	66%
National/international destination	43%	72%	53%	52%
Leading technological edge	50%	77%	50%	57%
Contracting-in	52%	23%	63%	47%
Contracting-out	80%	38%	88%	71%

Table 1 indicates that J firms are a minority to be doing contracting-in or contracting-out in Canada. However, it appears that firms oriented towards quality are frequent users of contracting out (88 %), and themselves do some contracting-in (63 %). The residual group also does quite some contracting out (80 %), as well as some contracting-in. This offers the possibility for Quebec and Canadian firms to develop networks of firms similar to the J style, but as other previous research indicated (Tremblay, 1996,...), the relations between Québec firms - at least in the region studied - do not seem to be as developed as they are in the Japanese case.

Features of the production process and work organization should, more than the preceding results, show a clearer trend towards the Japanese practices. Changes in the organization of production refer mainly to the adoption of just-in-time. In our sample, the Japanese firms have not been the prime adopters of this production mode (See Table 2). In fact, they have adopted modifications of production (comprising changes in work space, JIT, simplification of tasks, automation of machinery and automation of controls) in the same proportion than firms of the residual sample. They also adopted less means to improve their productivity (increase in the use of machinery, change in equipment, change in the organization of work, increased training of employees).

In none of the aspects surveyed with regards to work organization were the Japanese firms outstanding in any particular way. For important items of the Japanese work organization such as multitasking, rotation and the use of quality circles to perform some Kaizen, Japanese firms are actually less numerous in using these practices than their Canadian emulators (See Table 2).

Table 2. Aspects of the work organization of firms of the residual (E), Japanese (J) and quality (Q) sample

Aspects	E	J	Q	total
organization of production	40%	40%	49%	42%
-Just-in-time production schedules	35%	32%	54%	39%
measure to increase productivity	58%	63%	70%	62%

modification of work organization	32%	33%	50%	37%
- enlargement of tasks	46%	46%	50%	47%
- enrichment of tasks	37%	31%	54%	40%
- multitasking of employees	52%	62%	79%	61%
- rotation within teams	24%	35%	58%	35%
- quality circles	26%	19%	54%	31%
- quality of working life groups	13%	8%	17%	13%
- semi-autonomous work groups	20%	12%	38%	22%
- reduction of command levels	26%	46%	50%	38%
- integration of departments	46%	42%	54%	47%
Type of quality management ⁸	31%	34%	58%	38%
- total quality program	22%	42%	100%	47%

This leads us to examine aspects of human resources management, in Table 3. As mentioned previously, recruitment in the Japanese management model of employment relation is of great importance as employees are hired for a long term period and must be able to learn a multiple range of tasks. Continuous training provided in house and on-the-job is typical of the Japanese model and employees are accordingly hired at bottom of scale. Criteria for evaluation of employees provide a quite clear idea of hiring practices. Results show that Japanese firms, while hiring mostly for entry posts, do not provide for development of the career path in relation with the qualifications of the individual employed. Much like other firms, Japanese firms in Canada seem to draw on the external labor market. To the question: "Do part-time employees have more chances of being hired in case of an opening than those coming from the outside", Japanese firms seem even less keen to respond positively. Work appraisal criteria show that quantity of work and capacity to perform in work teams are relatively important while potential of the individual is less stressed.

Table 3. Aspects of the recruitment and appraisal criteria of human resources of firms of the residual sample (E), Japanese firms (J) and quality firms (Q)

Aspects	E	J	Q	total
Recruitment at entry	30%	54%	21%	34%
Recruitment function career path	11%	23%	13%	15%
promotion of part-timers	83%	76%	95%	84%
Evaluation criteria				
- acquisition of knowledge	41%	69%	77%	58%
- quantity of work done	61%	77%	64%	66%
- capacity for team work	66%	81%	59%	68%
- quality of work	86%	88%	95%	89%
- assiduity	55%	50%	45%	51%
- respect of production norms	34%	31%	55%	38%
- work attitude	57%	81%	86%	71%
- contribution to innovation	39%	46%	45%	42%
- potential	70%	46%	86%	67%
- critical incidents	23%	12%	32%	22%
- observation	23%	38%	45%	33%

Questions of training and employee involvement are also of importance in the Japanese model of human resources management and innovation. Training on a continuous basis provides workers with the ability to perform different tasks and the knowledge to participate in continuous improvement of the production process through suggestion systems, consultation and the like. Much of this training and involvement is provided through teamwork. Results shows that Japanese firms seem to use work teams to a lesser extent than other firms (Table 4) even though Table 3 indicates this is an important aspect for them in terms of evaluation.. If they seem to have less formalized training programs, this training is much more frequently done on a continuous basis (Table 4). Employees of the Japanese firms are less consulted than in firms of the other samples and participate even less in production decisions. Also, in half of the cases, they are not involved in a process of continuous improvement of quality/productivity, which is much less than in the Canadian firms (Q and E groups).

To enhance company identification and loyalty, Japanese firms in Japan often organize social activities for their employees. Results of the survey shows that J firms in Canada are on a par with the Q firm sample. One last important item of the Japanese model concerns the long term employment relation. Questioned as to what would be the preferred strategies of the firm in case of an economic slowdown, most firms in all samples responded that they would diminish the payroll which shows a poor commitment to the labor force as one would witness in Japan. Japanese firms were on the other hand those that acted the less on rationalizing the work force as they made less layoffs in the recent period, which is one of moderate expansion of the Canadian economy.(Table 4)

Table 4. Aspects of human resources of firms of the residual (E), Japanese (J) and quality (Q) samples

Aspects	E	J	Q	total
Work teams	50%	48%	67%	54%
Training program	61%	73%	88%	71%
Continuous training	47%	73%	65%	59%
Consultation of employees	76%	81%	96%	82%
Participation to production decisions	64%	48%	90%	66%
Continuous improvement process	76%	50%	92%	73%
Social activities for employees	61%	77%	79%	70%
Economic slowdown: diminish # employees	78%	73%	75%	76%
Recent layoffs	50%	46%	58%	51%

In the first section of our questionnaire, we attempted, as mentioned in the introduction, to survey the opinion of the respondents on important aspects of the philosophy of the human resources management of the firm. Asked to choose only one of a serie of statements, the first is generally associated with an American culture and the second with the Japanese way. For example, the following three issues on the employment relation were presented (Table 5). Managers in Japanese

firms seem more attentive to the motivation of the employees and their capacity to work in groups than the managers of the other samples, despite the fact that these firms were more organized in work teams. It is possible that more continuous training in the Japanese firms account for less need to hire specialized workers. However, Japanese managers did not think, as virtually all Q firms, that trained employees are worth keeping although other questions in the survey showed that they were less keen to proceed to layoffs. From another point of view, most managers of all samples valued equally the capacity to learn of the employees.

Table 5. Aspects of enterprise culture of firms of the residual sample (E), Japanese firms (J) and quality firms (Q)

Enterprise culture	E	J	Q	total
(A) New employees should foremost be productive in little time. or (J) New employees should foremost be motivated and able to work with others.	59%	77%	61%	64%
(A) The firm has everything to gain in keeping only the employees it needs in all times. or (J) Employees represent a training investment that is worth keeping.	70%	69%	100%	77%
(A) When hired, employees should know the work in order to be productive. or (J) When hired, employees should have the ability to learn.	76%	73%	71%	74%

note: percentages correspond to answers given to the J proposition

In terms of training, firms oriented towards quality are the ones that most frequently have training programs, but this seems more oriented towards integration of workers when they arrive in the firm than towards continuous training. Reasons for training seem to be more related to technology improvements than to continuous training for continuous improvement as is the case in the J model.

Table 6: Existence of training programs

	E	J	Q
training program	61%	73%	88%
continuous training	47%	73%	65%
training policy	41%	50%	50%

Table 7: Reasons for training

	E	J	Q
technological change	67%	69%	88%
skills development	40%	50%	58%
knowledge transfer	64%	73%	88%
new work methods	56%	50%	58%
mobility development	24%	27%	50%
improved productivity	64%	50%	71%

improved quality	69%	62%	79%
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Participation and implication of workers is important in the J model. Our data indicate that this is more common in quality oriented firms than in others, although the J firms favours consultation and employee suggestions, even in Canada. Kaizen is also clearly more frequent in quality oriented firms than in Japanese firms, that appear to do less than all others and not to have imported this practice in Canada.

Table 8: Implication of employees

	E	J	Q
Kaizen	76%	50%	92%
suggestions of employees	87%	85%	100%
consultation	76%	81%	96%
participation in production decisions	64%	48%	90%

All in all, firms that are quality oriented seem to often be closer to the J model than are J firms themselves. J firms seem to have adapted to the local North-American environment.

3.2. Conclusion and Perspectives

Our survey results show that Japanese transplants in Canada did not necessarily bring along their J model of HRM, work organization and management, which was so successful in Japan and is seen as part of the explanation of their success in terms of innovation. Given the interest for the J model, which is often associated with successful innovation systems, it is somewhat surprising to find this absence of transfer, although some practices did find their way to Canada. The reasons for this can be many: culture differences in workers, lack of knowledge of the J model by Canadian managers, absence of the traditional J network of firms, lack of institutional environment conducive to the adoption of the J model, amongst which the tradition of cooperation between firms (subcontractors and suppliers), as well as traditions related to human resources, such as low turnover of personnel and long term employment relationship.

It is however interesting to note that some Quality Oriented Canadian firms seem to be closer to the J model of HRM and production. This would indicate that there has been some diffusion of knowledge concerning the J-model, and that this has spurred some interest for imitation, leading to

hybridization of practices, as the Canadian firms have not adopted the integrality of the model. This can of course lead to questions concerning the transferability of the innovation capacity and quality development of J firms without adopting the whole model. It is possible that some elements may serve as functional equivalents, in the sense that they may lead to similar results in terms of quality and innovation, in the absence of certain elements typical of the J innovation system, particularly the long term employment system. It may be hypothesized that the high unemployment characteristic of Canada and Québec may be a functional equivalent, in the sense that it may force cooperation in the absence of long term employment, because it induces some fear of job loss, which may lead to cooperation and thus transferability of Japanese practices in another institutional setting and economic situation; this has to be verified in future research.

As this survey will be completed with case studies of Japanese and Québec firms, more insights will be developed to evaluate key dimensions of hybridized HRM practices of Japanese firms in comparison to the other firms and the transferability of these practices, as well as their impact on innovation in a different institutional setting. Of special attention, we will focus on the intertwined relationship between the employment relation, training and employee involvement, as some say these key dimensions are so closely related that they cannot be adopted one without the other (Brown, Reich and Stern, 1993; MacDuffie, 1995), and they appear essential for the innovation and quality processes characteristic of the J model. We will also attach importance to the relations between the firms in terms of contracting in and contraction-out, and the degree to which these practices are related to innovation, as they are in Japan.

¹Lado and Wilson (1994) referring to Williamson's (1975) analysis, think that hiring at the bottom of the salary scale is a practice which protects the firm from interpreting an employee's skills wrongly and allows human resources to be redeployed accordingly.

² This is the view of many authors, although according to Magota (1979), this practice does not correspond perfectly to the reality of all firms

³Japanese industrial relations are characterized by company unionism. Certain industrial federations are active and each spring they coordinate union demands. However, negotiations take place within the firms. The distinctive feature of this type of unionism is the absence of specific occupational groups within firms. The intra-firm equalization of salaries is often seen as a union demand. Japanese industrial relations can be described as micro-corporatist in the sense that all questions concerning salaries and income security are negotiated in a harmonious and consensual fashion within the firm.

⁴The Japanese language is in fact hierarchized according to the age of the person being addressed.

⁵Moreover, the Japanese union structure is an element which reinforces workers' identification with the firm. However, it should not be inferred that this is the source of the relatively harmonious industrial relations with comparatively rare workplace conflicts which are resolved through informal negotiation and very rarely through arbitration.

⁶ Some questionnaires had to be dropped because firms did not fit the necessary criteria to be included in the final sample, in terms of size and activity - i.e. production and not only sales offices. In the Japanese sample (J), the answer rate was 20% because the address book at hand did not always specify what kind of firm it was and because firms with at least 20 employees had to be selected, those with less dropped, given the object of our

research. The final Japanese sample is comprised of 26 firms, with about half of these being established in Quebec and the other half in Ontario. In the Canadian sample, the answer rate was 19% and firms of diverse, mostly of the manufacturing sector responded. These were grouped into 24 firms with a Japanese-style quality process (Q) and 46 other firms (E).

⁷ Although Boyer (1992) is of the opinion that this feature may not be essential.

⁸ To obtain this result we have weighted the five categories on quality management in the following way: (1) A better repair service at end of production line. (2) Frequent product or service changes to suit specific customers. (3) Precision inspection aiming at "Zero defaults". (4) A quality control performed by employees at each steps of production. and (5) A total quality program.

Bibliography

- AOKI, MASAHIKO, (1989), *Information, Incentives, and Bargaining in the Japanese Economy*, Cambridge, Angleterre, Cambridge University Press, 320 pages.
- BERNSTEIN, PAUL, (1988), "The Trust Culture", *Advanced Management Journal*, Vol. 53, N° 3, pp. 4-8, 23.
- BETCHERMAN, GORDON, Norm Leckie, and Anil Verma, (1994), *HRM Innovations in Canada : Evidence from Establishment Surveys*, Kingston, Ont, School of Industrial Relations, Industrial Relations Centre, Queen's University at Kingston, 16 pages.
- BOYER, ROBERT, (1992), *La surprenante capacité d'hybridation du modèle japonais: l'exemple de la CAMI*, Paris, Gerpisa (miméo), 38 pages.
- BROWN, CLAIR, Michael Reich and David Stern, (1993), "Becoming a High-Performance Work Organization: the Role of Security, Employee Involvement and Training", *International Journal of Human Resource Management*, Vol. 4, N° 2, pp.247-275.
- COLE, ROBERT E., (1993), "Different Quality Paradigms and their Implications for Organizational Learning", in Masahiko Aoki and Ronald Dore, eds, *The Japanese Firm: The Sources of Competitive Strength*, Oxford, Oxford University Press, pp. 66-83.
- DA COSTA, ISABEL, (1995), "Performance et concertation: quelques remarques autour de l'exemple japonais", in Diane-Gabrielle Tremblay, sous la direction de, *Concertation et performance économique: Vers de nouveaux modèles?*, Montréal, PUQ, pp. 85-122.
- DEDOUSSIS, VAGELIS and Craig R. Littler, (1994), "Understanding the Transfer of Japanese Management Practices. The Australian Case", in Tony Elger and Chris Smith, eds, *Global Japanization? The Transnational Transformation of the Labour Process*, New York, Routledge, pp. 175-195.
- DEMES, HELMUT, (1992), "The Japanese Production Mode as a Model for the 21st Century?", in Shigeyoshi Tokunaga, Norbert Altmann and Helmut Demes, eds, *New Impacts on Industrial Relations. Internationalization and Changing Production Strategies*, München, Iudicium Verl., pp. 469-488.
- DORE, RONALD PHILIP, (1973), *British Factory Japanese Factory. The Origins of National Diversity in Industrial Relations*, London, Allen and Unwin, 421 pages.
- DRACHE, DANIEL, (1994), "Lean production in Japanese Auto Transplants in Canada", *Canadian Business Economics*, N° spring, pp.45-59.
- FLORIDA, RICHARD and Martin Kenney, (1991), "Transplanted Organizations: The Transfer of Japanese Industrial Organizations to the US", *American Sociological Review*, Vol. 56, pp.381-398.
- HUXLEY, CHRITOPHER, David Robertson, James Rinehart and Herman Rosenfeld, (1995), "Le travail en équipe et le Kaizen. Une application dans l'industrie automobile canadienne: le cas CAMI", in Diane-Gabrielle Tremblay, sous la direction de, *Concertation et performance économique: Vers de nouveaux modèles?*, Montréal, PUQ, pp. 139-168.
- KENNEY, MARTIN and Richard Florida, (1993), *Beyond Mass Production: The Japanese System and its Transfer to the US*, New York, Oxford University Press, 391 pages.
- KOCHAN, THOMAS A. and Robert B. McKersie, (1992), "Human Resources, Organizational Governance, and Public Policy: Lessons from a Decade of Experimentation", in T. Kochan and M. Useem, eds, *Transforming Organizations*, Oxford, Oxford University Press, pp. 169-187.
- KOIKE, KAZUO, (1981), "Blue-Collar Proficiency is Key to Japan Success", *The Oriental Economist*, N° 49, pp. 6-10.
- KOIKE, KAZUO, (1987), "Human Resource Development and Labour-Management Relations", in Kozo Yamamura and Yasukichi Yasuba, eds, *The Political Economy of Japan*, Stanford, Stanford University Press, pp. 289-330.
- LADO, AUGUSTINE A. and Mary C. Wilson, (1994), "Human Resource Systems and Sustained Competitive Advantage: A Competency-Based Perspective", *Academy of Management Review*, Vol. 19, N° 4, pp. 699-727.
- LEONARD, JOSEPH W. and John Thanopoulos, (1982), "Japanese Management: Reasons for Success", in Sang M. Lee and Gary Schwendiman, eds, *Japanese Management: Cultural and Environmental Considerations*, New York, Praeger, pp. 139-147.

- LUNDEVALL, BENGT-ÅKE, (1988), "Innovation as an Interactive Process: From User-Producer Interaction to the National System of Innovation", in Giovanni Dosi, Christopher Freeman, Richard Nelson, Gerald Silverberg and Luc Soete, eds, *Technical Change and Economic Theory*, London, Pinter Publishers, pp. 349-369.
- MACDUFFIE, JOHN PAUL, (1995), "Human Resource Bundles and Manufacturing Performance: Organizational Logic and Flexible Production Systems in the World Auto Industry", *Industrial and Labor Relations Review*, pp.197-221.
- MAGOTA, RYOHEI, (1979), "The End of the Seniority-Related (Nenko) Wage System", *Japanese Economic Studies*, Vol. 7, N° 3, pp. 71-125.
- MATHEWS, JOHN, (1994), *Catching the Wave: Workplace Reform in Australia*, Ithaca, NY, ILR Press, 376 pages.
- MATSUSAKI, H., (1980), "Japanese Managers and Management in the Western World: A Canadian Perspective", in Anant R. Negandhi, ed., *Functioning of the Multinational Corporation: A Global Comparative Study*, New York, Pergamon Press, pp. 226-254.
- MELTZ, NOAH and Anil Verma, (1993), *Developments in Industrial Relations and Human Resource Practices in Canada: an Update from the 1980s*, Kingston, ON, Industrial Relations Centre, Queen's University, 52 pages.
- MORRIS, JONATHAN, (1994), "The Japanization of Industry: A Review of Developments in the UK and Canada", in Jorge Niosi, ed., *New Technology Policy and Social Innovations in the Firm*, New York, Pinter Publishers, pp. 173-186.
- MURAYAMA, MOTOFUSA, (1982), "The Japanese Business Value System", in Sang M. Lee and Gary Schwendiman, eds, *Japanese Management: Cultural and Environmental Considerations*, New York, Praeger, pp. 89-116.
- NEGANDHI, ANANT R., Golpira S. Eshghi and Edith C. Yuen, (1985), "The Management Practices of Japanese Subsidiaries Overseas", *California Management Review*, Vol. 27, N° 4, pp.93-105.
- NITTA, MICHIO, (1994), "Industrial Relations and Economic Development: The Experience of Japan after World War II", in Japan Institute of Labour, *Human Resources Management and Economic Development in Asia*, Tokyo, Japan Institute of Labour, pp. 275-287.
- ODAGIRI, HIROYUKI and Akira Goto, (1993), "The Japanese System of Innovation: Past, Present, and Future", in Richard R. Nelson, ed., *National Innovation Systems: A Comparative Analysis*, New York, Oxford University Press, pp. 76-113.
- ROBERTSON, D., J. Rinehart and C. Huxley, (1992), "Team Concept and Kaizen: Japanese Production Management in a Unionized Canadian Auto Plant", *Studies in Political Economy*, N° 39, pp.77-107.
- SASAJIMA, YOSHIO, (1993), "The Japanese Labour Market: Its Institutions and Performance", in J. Hartog and J. Theeuwes, eds, *Comparative Labour Market Contracts and Institutions. A Cross-National Comparison*, Amsterdam, North Holland, pp. 151-184.
- SCHONBERGER, RICHARD J., (1994), "Human Resource Management Lessons from a Decade of Total Quality Management and Reengineering", *California Management Review*, Vol. 36, N° 4, pp.109-123.

TREMBLAY, Diane-Gabrielle (1999). *Coopération et réseaux d'entreprises: problématique théorique et résultats d'une enquête menée au Québec*. Dans *Partenariats d'entreprises et mondialisation*. Ouvrage collectif à paraître sous la direction de l'Association des universités partiellement ou entièrement de langue française (AUPELF), en collaboration avec les universités de science économique de Hanoi et de Ho Chi Min ville, Vietnam.

TREMBLAY, Diane-Gabrielle (1998). *Districts industriels, systèmes industriels localisés et réseaux territorialisés; le rôle des imbrications locales dans le développement économique*. Dans *Mutations économiques et territoires*, sous la direction de M.-U. Proulx et B. Pecqueur. Paris:L'Harmattan.

TREMBLAY, Diane-Gabrielle (1998, sous la dir.). *Objectif plein emploi: le marché, la social-démocratie ou l'économie sociale ?*. Québec: Presses de l'université du Québec. 414 p.

TREMBLAY, Diane-Gabrielle (1996, sous la dir.). *Innovation, technologie et qualification; multidimension et complexité du processus d'innovation*. Québec: Presses de l'université du Québec. Collection Études d'économie politique.

- TREMBLAY, Diane-Gabrielle 1993. "Évolution économique, innovation et besoins de formation." in Enjeux actuels de la formation professionnelle. Questions de culture n° 19, Québec, Institut québécois de recherche sur la culture, 147-175.
- TREMBLAY, Diane-Gabrielle (1989). *La dynamique économique du processus d'innovation; une analyse de l'innovation et du mode de gestion des ressources humaines dans le secteur bancaire canadien*. Thèse de doctorat soutenue à l'Université de Paris I, Panthéon-Sorbonne. Paris: Université de Paris I. 2 volumes. 711 pages.
- TREMBLAY, Diane-Gabrielle and David Rolland 1998. *Gestion des ressources humaines; typologies et comparaisons internationales*. Québec: Presses de l'Université du Québec. 414 p.
- TREMBLAY, Diane-Gabrielle and David Rolland 1996. *The Japanese Model of Management in Québec: Towards a Theory of Hybridization*, cahiers de recherche, N° 96-2, Montréal: Télé-université.
- WHITEHILL, ARTHUR MURRAY, (1991), *Japanese Management: Tradition and Transition*, London, Routledge, 299 pages.
- WOMACK, JAMES P., Daniel T. Jones and Daniel Roos, (1992), *Le système qui va changer le monde*. Une analyse des industries automobiles mondiales dirigée par le MIT, Paris, Dunod, 319 pages.