

Transfer and Replication of Organizational Capabilities: Japanese Transplant Organizations in the United States

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Abstract

Organizational theory has long held that it is difficult to transfer organizations from one environment to another and that organizations that are transferred will take on characteristics of the new environment. We argue that organizations have the capabilities and the resources to transfer and to some degree replicate key capabilities in a new environment, and further to alter those environments in light of their functional requirements. We explore the question of organizational transfer and replication through the lens of a specific class of transplant organizations—Japanese automotive assembly plants and their suppliers in the United States. We believe that these transplant organizations provide an ideal case to explore such questions because they represent organizations which are being transferred from a supportive to a foreign environment. We find that these Japanese automotive transplants have effectively transferred and to some degree replicated key organizational forms and capabilities at both the intra- and inter-organizational levels.

1. Introduction

The relationship between organizations and their external environment has long been a central issue in organizational theory. Generally speaking, organization theory suggests that organizations are closely tied to their environments, that it is difficult to transfer organizations from one environment to another, and that organizations tend to adapt to and take on characteristics of the surrounding environment.

In this chapter, we explore the transfer and replication of key organizational forms and capabilities. Drawing from a decade-long study of Japanese-affiliated automotive *'tramp/ants'* in the USA, we advance the hypothesis that such forms and capabilities can be taken from an original environment and implanted into a new one. Furthermore, we argue that certain types of organizations have sufficient resources and capabilities to alter the new environment in light of their functional requirements.

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The research examined the transfer of key intra- and inter-organizational practices in light of three related research questions: (i) To what degree can organizations transfer and replicate key practices and capabilities in a new environment? (ii) What strategies do organizations utilize to respond to, and cope with, a new environment? (iii) Do they take on characteristics of the environment, or, if not, how do they act on the new environment to bring it into line with their needs? Our research is based on two major studies of the Japanese transplants in the USA: an initial study of the Japanese automotive transplants and their component parts suppliers conducted in 1988, and a 1994 study of the transfer and adoption of organizational practices by Japanese-affiliated transplants in all manufacturing industries which also included comparison with US manufacturing organizations. Transplants are ideally suited to this study of organizational transfer and replication since they represent organizations that have been transferred from one environment to another.

2. Theoretical Context

Organization theory suggests that organizations that are transferred from one environment to another will take on characteristics of the new environment. While some studies argue for a tight, deterministic connection between environment and organizations, most theorists suggest that organizations gradually take on characteristics of the new environment and/or of organizations with which they interact (Meyer and Rowan 1977; Zucker 1977; DiMaggio and Powell 1983; Granovetter 1985; Hannan and Freeman 1988).

Relatively few theorists focus explicitly on organizational influences on the environment. In his classic studies of innovation in capitalism, Schumpeter (1947) differentiated between *creative* responses that alter social and economic situations and the more typical *adaptive* responses of firms and economic organizations. Pfeffer and Salancik (1978) suggested that while organizations tend to adapt to their environments, they will sometimes alter the environment in line with their needs. Weick (1979) argued that the ability of an organization to influence, construct, or *enact* its environment is a function of size. Young (1988) suggested that organizations can change their environments by strategic use of resources.

The literature on Japanese organizations was generally pessimistic regarding their transfer. It basically argued that Japanese organizations derive from cultural factors such as homogeneity, familism, and group loyalty (Benedict 1946; Nakane 1970). For Abegglen (1958), Japanese organizational characteristics like team-based work organization and long-term tenure reflected a general close alignment between persons and groups. Dore (1973) contrasted the Japanese model of *welfare corporatism* with the Anglo-American model of *market individualism*. Doshe *et al.* (1996) saw Japanese production organization as a more advanced form of Taylorism (see also Kato and Steven 1993). Cole (1971) suggested that Japan's cultural legacy informs unique organizational solutions to general development problems. Until the mid-1980s studies were pessimistic about the transfer of Japanese organization (Cool and Legnick-Hall 1985).

There is, however, another strand of research and theory (Shimada 1986; Shimada and MacDuffie 1986; Aoki 1988; Koike 1988) that suggested that Japanese organizational forms were to some degree autonomous from culture and the environment. Taira (1962, 1964, 1970) documented the emergence of permanent employment from Japanese industrialists' need to cope with high rates of labour mobility and a desire to exert more effective control over the labour force. Gordon (1985) indicated that team-based work organization is the product of post-war industrial unrest over worker control of production (also see Kenney and Florida 1988). Empirical research (Lincoln and Kalleberg 1985, 1990) also noted that Japanese organization rather than culture is the source of workforce motivation, control, and commitment.

The empirical evidence regarding the transfer of Japanese organizational forms and practices is mixed. An early study by Yoshino (1976) suggested that the absence of Japanese socio-cultural conditions in other countries is a serious obstacle to transfer. Cole (1979) was guardedly optimistic:

There are those who would argue that they [quality control circles] have their basis in Japanese cultural and institutional conditions, with their unique group orientation, practice of permanent employment, and strong employee commitment to organizational goals. Consequently they are held not to be applicable to the United States. My own judgement is they may well be applicable if appropriate adaptations are made to accommodate the circles to US conditions. (Cole 1979: 255)

White and Trevor (1983) concluded that Japanese organizational traits were not transferred to Japanese firms operating in the UK. However, Morris (1988), Oliver and Wilkinson (1989), and Kumazawa and Yamada (1989) concluded that the Japanese management system was successfully transferred to Japanese firms in the UK. A study of Nissan in the UK (Crowther and Garrahan 1988) documented the emergence of a Japanese-style automobile production complex comprising a main assembly plant and supplier firms.

There was a considerable amount of research and empirical study of the transfer of Japanese organization to the US beginning in the late 1980s. A series of case studies initially identified the transfer of Japanese organizational practices to the USA (Krafcik 1986; Mair *et al.* 1988; Adler 1993). An MIT study of the global automotive industry found transplants to be important factors in the cross-national diffusion of *lean production* (Krafcik 1989; Womack *et al.* 1990). Research by Florida and Kenney (1991, 1992a; Kenney and Florida 1993) found that automotive transplants transferred key practices related to work organization and supplier relations to the USA. They concluded therefore that Japanese work organization represented a set of organizational practices that could be extracted from one environment and replicated in another.

Other studies were pessimistic regarding the ability of transplants to transfer and replicate organizational practices while others were more critical of Japanese work practices in general (Parker and Slaughter 1988; Howes 1993). A study of Japanese transplants in California (Milkman 1991) found little evidence of transfer, and argued that transplants tended to emulate traditional US management practices. That study

was criticized, however, for basing its conclusions on a limited sample which was drawn mainly from the transplant electronics industry in Southern California (see Florida 1993; MacDuffie 1993). In a more journalistic exposition based upon off-site interviews with employees and union officials, Fucini and Fucini (1990) argued that the Mazda plant in Flat Rock, Michigan has experienced numerous problems in the transfer of Japanese production methods including high rates of injury, worker discontent, and labour—management conflict.

Still other studies revealed a varied pattern of transfer and adoption. A series of systematic case studies by the University of Tokyo (1990; Abo 1993) found that the transfer of organizational practices differed considerably by industry, with automotive-related transplants exhibiting the greatest propensity to transfer Japanese innovations to the US, while electronics transplants tended to emulate US practices and thus adapt to the US environment. A study of Japanese transplants in the USA and Europe (Fujimoto *et al.* 1994) found evidence of transfer of Japanese-style production process management and quality-control practices, but noted that human-resources practices (particularly those related to labour markets and remuneration) tended to conform to the local environment. A case study of the Subaru-Izusu plant in Indiana by Graham (1993) found that there was considerable resistance to the transfer of Japanese production methods; however, evidence provided in the study indicated that those production methods were still being transferred. Case studies by a team from Michigan (Cutcher-Gershenfeld *et al.* 1995) showed that Japanese transplants differed considerably in the implementation of work teams. The Michigan team attributed these differences to a number of factors, including the nature of the production process, whether the plant was wholly Japanese-owned or a joint venture, and whether it was a new plant or an older acquired facility.

3. Research Design

This chapter draws from the findings of two related research projects on the Japanese transplants in the USA, an initial survey research and field research on Japanese automotive transplants (both assembly plants and suppliers) conducted by Florida and Kenney (1991; Kenney and Florida 1993) in the late 1980s, and a subsequent survey research project on the adoption of advanced production and work practices by Japanese transplants across industries conducted by Florida and Jenkins (1998; Jenkins and Florida 1999) in 1994-5. We defined *transplants* as either wholly Japanese-owned manufacturing establishments or factories which have a significant level of Japanese participation in cross-national joint ventures in the automobile assembly and automotive component parts industries.

The 1988 study included both fieldwork at the automotive assembly transplants and a mail survey of transplant automotive suppliers. The fieldwork was conducted at six of the seven then operating transplant assembly plants in the US and at various supplier firms. More than 100 personal interviews were conducted with Japanese and American executives, managers and engineers; shopfloor workers and trade union officials; and state and local government officials.

The 1988 mail survey was administered to the universe of Japanese-owned or Japanese—US joint venture suppliers in the USA. The sample population was drawn from a database of Japanese transplant assemblers and suppliers from data provided by the Japan Economic Institute, US government sources, industry trade journals, and newspaper reports. Addresses were located for 196 of the 229 suppliers in the original database. Each establishment was then contacted by telephone to identify the appropriate person to complete the survey. The survey resulted in seventy-three completed surveys for a response rate of 37.2 per cent, which is comparable to the rates in other research of this type (see Lincoln and Kalleberg 1985 for example).

The 1994 survey was a survey of all Japanese transplants across industries in the USA, designed to obtain comprehensive information on production work organization, supplier relations, plant characteristics and performance of Japanese manufacturing transplants, and a selected sample of US affiliated manufacturing plants that serve as the suppliers to the Japanese transplant automotive assemblers. The sample of Japanese transplants was based on the 1,695 transplant establishments in the 1993 Japan External Trade Organization (JETRO) database. We supplemented the JETRO list with data on Japanese investment in US manufacturing from other sources, including the list of Japanese-affiliated plants in the USA as of 1990 compiled by the Japan Economic Institute (MacKnight 1992); directories of Japanese-affiliated companies operating in the USA, such as the *Japan Company Handbook*; and various newsletters, news articles, and other publications, resulting in a database of 1,768 transplant manufacturing establishments. Excluding 359 transplants involved in food processing and related industries resulted in a total sample size of 1,409 Japanese transplant manufacturing establishments. The survey was administered to plant managers in these establishments by the Center for Survey Research (CSR) of the University of Massachusetts, Boston. The survey was implemented in 1994 in two phases: the first involving a mail survey and the second relying on telephone interviews. Based on an initial screening, 238 additional plants were eliminated from the sample frame, resulting in a frame of 1,195 Japanese transplants and 338 US suppliers to the transplants. The survey achieved an unadjusted response rate of 40 per cent. In addition, data from a 1992 survey of the adoption of innovative workplace practices conducted by Osterman (1992) were used to compare the transplants to a sample of US-owned manufacturing establishments.

4. Intra-Organizational Factors

4.1. Work and production organization

Table 10.1, which is drawn from the 1988 fieldwork on automotive assembly transplants, summarizes the main characteristics of intra-organizational practices for transplant assemblers and for a representative Big Three automobile companies as of 1988. Table 10.2, based on the 1988 supplier survey, presents similar information for transplant suppliers.

TABLE 10.1 Comparison of organizational practices in the automotive transplants and the Big Three

	Work teams	Rotation	Job classification	Worker QC	Annual wage \$US	Hourly wage \$US*	Union
Auto Alliance	+	+	2	0			
Diamond-Star	+	+	2	0	38,406	16.22	Yes
Honda	-	+	3	0	36,982	17.00	Yes
NUMMI	+	+	4	0	41,545	16.20	No
Nissan	+	+	4	0	36,294	17.85	Yes
Subaru-Isuzu	+	+	3	0	—	15.62	No
Toyota	+	+	3	0	39,582	16.43	No
Big Three	—	—	90	—	—	17.59	Yes

Notes: + = similar to Japan; 0 = modified; — = different from Japan.

However, in the last five years, many Big Three plants are adopting Japanese-style work practices.

* This does not count the cost-of-living wages received in unionized transplants which are calculated separately, but increase worker's pay quarterly.

Source. Author's compilation from various sources.

TABLE 10.2 Percentage of transplant parts suppliers with selected Japanese intra-organizational practices, USA, 1988

Characteristic	Per cent	No. of cases
Work organization		
Work teams	76.7	73
Rotation within teams	87.0	69
Rotation between teams	66.2	68
Just-in-time inventory control	68.5	73
Worker involvement		
Production workers maintain their own machines	79.5	73
Production workers do routine quality control	98.6	73
Production workers help design their own jobs	60.9	69
Division of labour		
No. of job classifications		
1	34.3	67
2	14.9	67
3	16.4	67
4	14.9	67
5	6.0	67

Source. Richard Florida and Martin Kenney, *Survey of Japanese Automotive Transplant Suppliers*, 1988.

Job classifications. The use of a relatively small number of job classifications is a key characteristic of work organization in Japanese automotive factories. This differs from the traditional US system of production organization, particularly in the automotive industry, which was distinguished by large numbers of separate job classifications. A 1986 study by Kochan *et al.* reported that the unionized plants in a multidivisional US manufacturing firm had an average of ninety-six job classifica-

lions. Table 10.1 indicates that transplant assemblers in our 1988 study used no more than four job classifications, whereas a representative traditional US Big Three automotive plant had ninety. Furthermore, more than 85 per cent of transplant suppliers that responded to the 1988 survey reported that they had five or fewer job classifications for production workers; and one-third used only one job classification.

Fork teams. Another characteristic of the organization of work in Japanese factories is the use of work teams composed of production workers who are responsible for planning and carrying out production tasks (Aoki 1988; Koike 1988). Teams socialize production tasks and assign immediate managerial tasks to shopfloor workers. Table 10.1 indicates that work teams were used at all of the transplant assemblers. Our field research found that teams met daily at Honda, Toyota, and NUMMI to discuss production improvements and redesign of tasks; meetings at the other transplants took place at least once a week. More than three out of four of the transplant suppliers in the 1988 survey reported that they organized production work on the basis of work teams (see Table 10.2).

Rotation. Rotation of workers among tasks within a team is another much cited feature of production in automotive assembly plants in Japan. Rotation functions to train workers in multiple tasks and to reduce the incidence of repetitive motion injuries. While rotation was used by all transplant assemblers in our 1988 study, its frequency varied. Toyota, Honda, and NUMMI reported that workers rotated frequently within their teams. Rotation, however, was less frequent at Mazda, Nissan, and SIA. At the time of our 1988 site visits and interviews, these plants considered rotation a longer-term objective. Mazda workers we interviewed stated that infrequent rotation was a major cause of repetitive motion injury. The findings of the 1988 supplier survey indicated that roughly 87 per cent of suppliers rotated workers within teams, while approximately 66 per cent rotated workers among teams. Field research at Nippondenso's Battle Creek, Michigan plant found that plant rotated workers in high-stress jobs every hour or two and encouraged workers to apply for rotation from team to team.

Quality circles. Quality circles are another element of the organization of production work in Japanese automotive plants (see Cole 1989a; Lillrank and Kano 1989). In Japan, quality circles are composed of groups of production workers who devote effort outside regular working hours to improving an element of the production process. According to a 1986 study by Lincoln *et al.* (1986: 354), 76 per cent of employees in a sample of Japanese plants participated in quality circles compared to 27 per cent of workers in US plants. The assembly transplants in our 1988 research varied in the extent and intensiveness with which they employed quality circles. Toyota and Honda reported extensive use of quality circles, Mazda and NUMMI used them moderately, and SIA not at all. Slightly less than half of suppliers in the 1988 survey used quality circles. Transplant assemblers in our 1988 research reported that they paid workers for involvement in quality-circle activity. Of suppliers in the 1988 survey that used quality circles, 83 per cent reported that they paid workers for hours spent working on quality circles. Several transplants in the 1988 study reported that they established competitions between quality-control circles and used prizes,

plaques, and cash awards as additional incentives for quality-circle participation. Some transplants reported that they sent American quality circles to Japan to participate in annual company competitions.

Just-in-time inventory control. Production in Japanese automotive assembly plants is organized according to the just-in-time system of inventory control in which materials are forwarded as needed and inventory is kept to a minimum (Cusumano 1985; Sheard 1985). All the transplant assemblers and over two-thirds of suppliers (68.5 per cent) in the 1988 study used a just-in-time system of production control. The 1988 supplier survey asked: 'How similar is your manufacturing process to one that might be found in Japan?' Eighty-six per cent of the respondents said that their US manufacturing practice was either 'exactly the same' or 'very similar' to one that might be found in Japan; only one supplier said that it was not at all similar.

4.2. Change over time: 1994 survey results

The results of the 1994 survey support these earlier findings and shed some additional light on key intra-organizational factors. We were especially interested to see whether or not the transplants have deepened their transfer and adoption of intra-organizational practices and capabilities over time. To shed light on this issue, we compared the findings for the automotive-related transplants in the 1994 survey with the findings of the 1988 survey in Table 10.3. As these data show, there was not a great deal of change over this six-year period. The proportion of plants using teams, job rotation, and few job classifications was relatively stable between 1988 and 1994, although the proportion using quality circles increased substantially. Here, it is important to note that the 1988 survey asked respondents not only if they currently used quality circles but if they planned to do so. A substantial proportion of these plants were just starting up production at the time, and many had not yet fully implemented their human resource and work organization systems. The proportion in the 1988 sample that either used quality circles currently or planned to do so in the near future (73.6 per cent) was closer to the 1994 result (85.7 per cent). Interestingly, the proportion of plants using these practices in combination with one another also remained virtually unchanged. About a third of Japanese automotive supplier transplants used teams, rotation, and quality circles in combination in 1994, compared to 22.2 per cent in 1988. A large part of this difference stemmed from the greater use of quality circles. Furthermore, there was a smaller proportion of plants in the 1994 survey that used none of the practices, providing some limited evidence of increased adoption and diffusion. One explanation is that Japanese automotive transplants originally implanted a fairly advanced set of organizational practices and basically stuck with those practices over time, making little refinement or revision. It is also important to note that our survey documents the level of transfer and adoption of practices, but not worker behaviour under those practices. The field research findings suggest that workers have become more involved in and adept at continuous improvement activities over time.

Our 1994 survey also explored differences in the transfer and adoption of intra-organizational practices for the transplants and US manufacturers in the automotive

sector as well as other manufacturing industries. The data on adoption of practices by US-owned manufacturers were provided by Osterman (1994). As Table 10.4 shows, among the US plants, those in transportation equipment were far and away the highest adopters of innovative practices. In fact, US plants in the transportation

TABLE 10.3 Transfer and adoption of innovative work practices by Japanese-affiliated auto-supplier transplants, 1988-94

	1988	1994	1994*
Any teams	76.7	75.3	72.2
Any self-directed teams	71.2	48.4	33.3
Job rotation between work groups	61.6	65.2	66.7
Any quality circles	44.4	85.7	83.3
2 or fewer job classifications	43.0	34.7	58.3
Teams + Rotation + QCs = 3	22.2	33.9	16.7
Teams + Rotation + QCs + few job classifications = 0	9.5	1.8	0.0

Notes: All figures are expressed as the percentage of establishments using the practices indicated.

* These figures are for the 36 plants in the 1994 survey sample that also responded to the 1988 survey by Florida and Kenney.

Sources: Richard Florida and Davis Jenkins, *Japanese Transplant Project* (Carnegie Mellon University, May 1995), and Richard Florida and Martin Kenney, *Survey of Japanese Automotive Transplant Suppliers*, 1998.

TABLE 10.4 Percentage of transplant first-tier suppliers with selected Japanese inter-organizational linkages, USA, 1988

Characteristic	Linkages to assemblers	No. of cases	Linkage to second-tier suppliers	No. of cases
Transit time				
¹ hour	6.9	72		
¹ hour-2 hours	33.9	72		
2-8 hours	38.9	72	—	
8-24 hours	9.7	72		—
Deliver according to just-in-time schedule	80.0	70	43.0	72
Immediate feedback on defective parts	90.2	72	97.2	72
Customers' engineers visit plant site				
For quality control problems	96.8	62	96.9	65
For production problems	74.2	62	83.1	65
Interaction in design				
Close interaction between supplier and customer	50.0	72	33.8	71
Supplier bids on customer design	31.9	72	62.0	71
Supplier can alter customer design	22.2	72	11.3	71
Supplier designs subject to customer approval	15.3	72	11.3	71
Supplier designs but customer can alter	6.9	72	8.5	71

Source: Richard Florida and Martin Kenny, *Survey of Japanese Automotive Transplant Suppliers*, 1988

equipment sector were more likely than their Japanese transplant counterparts to adopt innovative organizational practices. US transportation equipment manufacturers had the highest rates of adoption of teams, job rotation, quality circles, and statistical process control. Sixty-eight per cent of US plants in this sector used teams, rotation, and quality circles in combination.

4.3. Status and hierarchy

The 1988 field research enabled us to probe a series of other factors associated with intra-organizational characteristics including status and hierarchy issues, workforce selection and socialization, and actual behaviour in organizations.

Status. Overt status distinctions between management and blue-collar workers are less evident in Japan than in the US. For example, in Japan workers and managers eat in the same cafeteria; middle-level managers wear the same uniforms as shopfloor workers. Managers typically do not have enclosed offices, but sit at desks on a large open floor adjacent to the production facility. All transplants we visited during our 1988 field research had shared cafeterias. Nissan was the only transplant in our 1988 fieldwork where status distinctions were visible, such as a separate parking lot for top managers' cars and private American-style offices. All the transplant assemblers in our 1988 fieldwork provided uniforms, although some gave workers the option of wearing street clothes. Transplant officials we interviewed suggested that uniforms created an identification between workers and the company. Most top executives wore company uniforms in our 1988 fieldwork, Nissan being the exception. In fact, we were led to conclude on the basis of our 1988 fieldwork that the transplants had greater visible status equality than in Japan where top executives have chauffeured company automobiles and wear suits and ties rather than work uniforms.

Hierarchy. Based on a 1986 survey study, Lincoln *et al.* (1986) indicated that management hierarchies are taller in Japan than in the USA. The findings of our 1988 fieldwork indicated that management hierarchies in the automotive transplants were relatively flat. At Honda, there were nine levels in the internal hierarchy: associate, team leader, coordinator, department manager, plant manager, assistant vice-president, senior vice-president, executive vice-president, and president. This structure was typical of the other transplants as well. At Honda, the various vice-presidents did not form separate levels in the reporting structure, but were part of senior management team, which included the plant manager and the president of Honda America Manufacturing. This senior management team made decisions as a group and thus functioned to some extent as a single reporting level. The president of Honda America was a member of and reported to the board of directors for Honda Japan. We found that a number of shopfloor workers had risen to management ranks at Honda and the company actively encouraged such mobility. Toyota officials reported that shopfloor workers were recruited for middle-level management positions in the factory and the front office. Additional fieldwork we conducted at Toyota during the 1994 study reinforces this earlier finding. Toyota had developed an extensive (three-year) in-house training programme to recruit and develop its next generation of skilled maintenance workers from the ranks of its assembly workforce.

Team leaders. Numerous studies noted the role played by team leaders in automotive assembly plants in Japan. Team leaders are members of shopfloor work-groups but also have managerial responsibility for immediate production activities. In this sense, they replace the more traditional American job category of foreman whose job was to supervise shopfloor workers. Team leaders were used at all the transplant assemblers we visited in the 1988 fieldwork, and 84 per cent of suppliers in the 1988 survey. At some assembly transplants, team leaders were selected by management, while at others, especially the unionized transplants, team leaders were selected by joint labour—management committees. All the transplants reported that they considered the input of workers to be an important criterion for the selection of team leaders.

Job security. Long-term employment tenure is a much discussed feature of Japanese work organization (Abegglen 1958; Taira 1962; Dore 1973; Cole 1979; Lincoln and Kalleberg 1985). In our 1988 fieldwork, we found that the pattern of employment security differed between unionized and non-unionized assembly transplants, and between assemblers and suppliers. Our review of the labour—management agreements for the unionized assembly transplants indicated that all of them had formal contractual agreements stipulating tenure security and guaranteeing jobs except under conditions that jeopardize the financial viability of the company. We also found that NUMMI kept full employment during periods of up to 30 per cent reduction in output by eliminating overtime, slowing the work pace, offering workers voluntary vacation time, placing workers in special training programmes, or transferring them to other jobs. Mazda workers were loaned to local governments during slowdowns. The non-unionized transplants provided informal assurance of tenure security, although this was not reflected in contractual agreements. Nissan and Toyota redeployed workers to other jobs to avoid lay-offs.

Transplant suppliers in our 1988 survey did not offer formal guarantees of tenure security. However, more respondents indicated that the Japanese long-term employment system *should* be transferred to the USA. Nevertheless, they offered a wide range of opinions on this issue—some saw long-term employment as a source of long-run productivity increases, others saw the threat of termination as a way to motivate American workers.

Unionization. Japanese automotive assembly plants are represented by enterprise or company unions (Taira 1962; Shirai 1983). This differs markedly from the prevailing US practice of industrial unionism. The transplants in our 1988 study developed two basic strategies to cope with US labour relations. A number of automobile assembly transplants simply chose to avoid unionization. Furthermore, only four of the seventy-one respondents to the 1988 supplier survey were unionized. The four non-unionized assemblers—Honda, Toyota, Nissan, and SIA—chose rural *greenfield* locations at least in part to avoid unionization. Nissan went to great lengths to defeat a unionization drive. SIA implemented an in-plant video system to communicate messages to workers in anticipation of a unionization campaign. Non-unionized transplants, notably Nissan and Toyota, used employee handbooks that provided plant rules and regulations and formed employee associations to collect employee

input and create a stable structure through which work-related grievances were addressed. The unionized transplants, Mazda, NUMMI, and Diamond-Star, established independent agreements with their respective union locals that enlist the union in the implementation of Japanese-like work organization. These agreements made it possible to implement smaller numbers of job classifications and more flexible work rules and to utilize pay systems that differed markedly from typical US automotive industry practice. Related research by Smith and Florida (1994) on the location choices of a large sample of Japanese automotive-related transplants found no statistical evidence that transplant manufacturers were avoiding relatively unionized locations. In fact, transplant manufacturers tended to cluster in manufacturing-intensive areas with relatively higher concentrations of unions.

The 1994 survey also collected data on unionization of Japanese transplant suppliers. The survey results indicated that 15.3 per cent of wholly Japanese-owned suppliers and 17 per cent of Japanese—US joint venture suppliers were unionized. This compared to a 35.4 per cent rate of unionization for US-owned suppliers in our survey that supplied Japanese assembly transplants.

4.4. Socialisation

Japanese corporations did not simply impose Japanese production organization and manufacturing practice on their American workforces. Instead, they used a number of selection and socialization mechanisms to ensure effective transfer.

Workfare selection. The transplants used recruitment and selection processes to identify workers who possess initiative, are dedicated to the corporation, work well in teams, and do not miss work. The process differs from the recruitment policies of Japanese corporations in Japan (Rosenbaum and Kariya 1989) but serves a similar function. In Japan, high-school teachers often recommend workers to companies. In this way, they perform a screening function that was not available in the USA at the time the transplants were established. This practice differs markedly from the traditional US practice of hiring off the street, though this practice has changed since then and US companies now use similar workforce recruitment and selection practices as the transplants. The transplants in our 1988 study subjected potential workers to cognitive and psychological tests and other screening procedures to identify workers with appropriate characteristics for team-based work and continuous improvement activities. The transplants frequently subcontracted to specialized 'assessment centres' to perform this function. In this process, the transplants examined the previous job records or high-school records for absenteeism and other qualities. Moreover, as much as possible, they hired individuals with no previous factory experience (in this way replicating the Japanese practice of hiring individuals directly out of high schools or universities). Potential employees were put through extensive interviews with personnel officials, managers, and even members of their potential work teams to rate their initiative and group-oriented characteristics. While theorists have generally treated the so-called loyalty of the Japanese workforce as a product of Japanese culture, all Japanese firms, including transplants, make significant conscious efforts to inculcate loyalty in their workforces. Among the transplants, the screening and

selection process constitutes an organizational mechanism that selects potentially loyal workers from a large, diverse population.

Prior to start-up, all the assembly transplants sent key employees (e.g. managers and team leaders) to Japanese sister plants for three to six months. There they received both formal training and informal socialization to Japanese practice (e.g. teamwork and *kai-en*). They worked closely with veteran Japanese trainers, who transferred formal and tacit knowledge of production and who functioned as role models to some extent. Workers and trainers also spent time together outside work to continue the socialization process. These trainers then came to the US for periods from three months to two years to work alongside the same US employees and their teams. The 1988 supplier survey indicated that 33 per cent of American managers were sent to Japan for training. According to workers who were interviewed during our 1988 field research at various transplant assembly facilities, trainers provided the most substantial and significant exposure to Japanese practices.

The transplants used ongoing training and socialization programmes to acclimate workers to Japanese production. Most employees began with a six- to eight-week introductory session that included an overview of automotive assembly and fairly rigorous socialization in the Japanese model. After this, workers were assigned to teams where they continued to learn from senior employees. According to the 1988 supplier survey, respondents provided an average of eight days of training for factory workers before they assume shop floor activities (range = 0-180 days). This was supplemented by an average of sixty-one days additional training on the shopfloor (range = 1-302 days).

4.5. Organisations and behaviour

It is important to distinguish between the form of Japanese organization and its substance, i.e. its effects on worker behaviour. A main objective of the Japanese system of work and production organization is to harness the collective intelligence of workers for continuous product and process improvement. This stands in sharp contrast to traditional intra-organizational practices in American automotive assembly plants, where there were formal and informal organizational barriers and norms inhibiting the use of worker intelligence (Braverman 1974; Edwards 1979; Burawoy 1979, 1983). In Japan, workers are expected to actively participate in company suggestion programmes and quality-control circles as well as informal, everyday *kaken*, or continuous improvement activities. Here, it is important to note, however, that different Japanese automobile corporations vary in their ability to motivate workers to participate in such practices. In this arena, Toyota is clearly the most effective. Japanese scholars use the term *voluntarism* to explain the extraordinary initiative of workers in Japan. Here again, we note that Japanese automobile companies vary significantly in their ability to generate voluntaristic behaviour—with Toyota being the most effective.

Worker initiative. Transplants encourage worker initiative through the delegation of managerial authority and responsibility to shopfloor workers. Workers at the transplants, especially Honda and Toyota, were found to have significant input into the

design of their jobs. More than 60 per cent of respondents to the 1988 supplier survey indicated that production workers were involved in the design of their tasks. Our field research at Toyota and Nippondenso indicated that work teams designed standardized task descriptions for their work units, posting them in the form of drawings and photographs with captions at their work stations. Roughly 80 per cent of suppliers in the 1988 survey reported that production workers were responsible for routine maintenance on their own machines.

Japanese corporations use suggestion systems to harness workers' knowledge and ideas. Our fieldwork indicated that Honda and Toyota established fairly well-developed suggestion systems. Although Mazda had a suggestion system at the time of our original fieldwork, Mazda workers had at times boycotted it to express their dissatisfaction with management policy. The 1988 supplier survey found that 30 per cent of respondents provided cash awards for worker suggestions, and two-thirds reported that 'willingness to suggest new ideas' was a key factor in evaluating production workers.

In our fieldwork, we also asked managers (in this case Japanese managers with experience in Japanese factories and transplant factories) to engage in a comparative exercise and to estimate in a rough sense how much, in percentage terms, Japanese *kaizen* or continuous improvement activity they were able to replicate in their American workforce. While these estimates are rough and certainly subjective, they are nonetheless revealing. Honda managers reported that they had completely replicated Japanese practice in their US plant. A Toyota manager who worked in numerous Toyota plants in Japan as well as at NUMMI and Georgetown, Kentucky, indicated the Georgetown plant was at 60 per cent of Japanese practice and NUMMI at 40 to 50 per cent. Nippondenso managers also reported that they had closely replicated Japanese practice. Officials at Mazda and Nissan reported that they had experienced more difficulty implementing *kaizen* activity, and stood at roughly 50 per cent of Japanese practice. Managers at SIA estimated that the plant was at about 30 per cent of Japanese practice. In our earlier research (Florida and Kenney 1991), we noted that progress of the transplants on this dimension was remarkable, given the time transplant organizations had to socialize American workers to the requirements of Japanese-like work organization. We stand by that assessment today.

Adaptation. The findings from our 1988 fieldwork indicated that while production workers in the USA experienced few problems adapting to Japanese-like organizational forms, management was the source of recurring adaptation problems. Our interviews with NUMMI workers, who previously worked for GM, found that these workers preferred work in the transplant organization to work in the old GM factory. According to one: 'I was at GM and the part I didn't like—which I like now—is that we had a lot of drug and alcohol problems. It was getting to the point, even with me, when it got around lunchtime I had to go out ... and take down two or three beers.'

Both our 1988 and 1994 fieldwork suggested that management was the source of the most serious adaptation problems. During site visits and interviews, we were told repeatedly that American middle managers, especially those recruited from US

automobile corporations, experienced great difficulty adapting to work and production organization at the transplants. A number of transplant automotive assemblers reported that previously formed attitudes and prejudices of US middle managers toward factory workers represented a serious problem. White and Trevor (1983) documented a similar problem in UK transplants. NUMMI workers in the 1988 study complained that American managers were still operating in the 'old GM style'. As one worker put it: 'A lot of things have changed. But see, you hear people talk. You hear them saying once in a while: "Oh, we're going back to the GM ways." I hope not. That was rough. I think to completely bring back the Japanese way, Japan would have to take over the plant completely and have nothing to do with General Motors at all.' Japanese transplant managers indicate that problems with American middle managers encouraged them to promote shopfloor workers to supervisory positions.

5. Inter-Organizational Factors

Inter-organizational relationships are increasingly seen as an important component of organizational forms and capabilities, and as significant mechanisms in the diffusion of new and innovative organizational practices. Nishiguchi (1994) suggested that inter-organizational (e.g. customer-supplier) relations were a powerful mechanism for diffusion of intra-organizational practices. Florida and Kenney (1991) found evidence of an elective affinity between intra- and inter-organizational practices. Using data from a 1993 survey of first-tier automotive parts supplier plants in the US, however, Helper and Levine (1993) found no evidence that having a Japanese customer predicts the presence of employee participation within the plant.

Our fieldwork in the US and Japan found that Japanese assembly transplants initially located facilities in the lower Midwestern region of the USA to take advantage of the indigenous infrastructure of domestic automobile parts suppliers. US-owned supplier firms were unable to adapt to the delivery and quality requirements of the Japanese just-in-time system. Dismayed by the performance of US suppliers, assembly transplants encouraged their first-tier Japanese suppliers to locate in the USA. The Japanese suppliers, in turn, found it in their interest to expand overseas. In effect, the creation of a Japanese-like supplier system in the USA can be understood as a *creative response* (Schumpeter 1947) to the deficiencies of the US environment.

Transplant assemblers played an active role in the creation of this new production environment by financing and helping to set up US branches for key suppliers. For example, Honda encouraged two of its Japanese suppliers to form Bellemar Parts to supply seat sub-assemblies. In another instance, Honda provided technical and financial assistance to a group of Japanese suppliers to form KTH Parts Industries, a company that took over US production of chassis parts that were once produced in-house by Honda at Marysville. By 1988, nearly half of Honda's main suppliers in Japan operated US plants. The 1988 supplier survey found that twelve of seventy-three suppliers were partially owned by the assemblers they supply.

Both our fieldwork and survey research found that Japanese automotive assemblers played the key role in influencing both the original decision of transplant suppliers to relocate production in the USA and their choice of locations in the USA. The 1988 supplier survey found that more than 75 per cent of respondents established US operations to maintain close ties to a major Japanese customer, and 90 per cent chose their specific locations to be close to a major customer. Traditional environmental factors like the local labour market or local labour costs have relatively little impact on locational choices.

5.1. Supplier relations

Table 10.4 summarizes the key findings from the 1988 supplier survey regarding the main characteristics of relations among transplant assemblers and suppliers. This table reports the responses of seventy-three transplant suppliers on their supply relationships with transplant assemblers and with their own second-tier suppliers. Geographic proximity is a basic characteristic of the Japanese supplier relations (Sayer 1986). Among transplant suppliers, 40 per cent reported that they were located within a two-hour shipping radius of end-users, and almost 90 per cent were located within an eight-hour radius. Eighty per cent made just-in-time deliveries. Still, the distances separating end-users from suppliers were somewhat greater in the USA than in Japan. This geographic pattern or *transplant complex* can be thought of as essentially a stretched-out version of Japan's dense just-in-time supplier system, likely to be due to the greater availability of land, well-developed highway systems, larger trucks, and greater storage capacity in the USA.

Interaction and information exchange. Table 10.4 also sheds light on the scope and nature of information exchange between transplant assemblers and suppliers. The 1988 survey found that approximately 97 per cent of transplant suppliers were contacted immediately by phone when they delivered a defective product. Eighty-two per cent of respondents indicated that engineers from their major customer came on-site while they were setting up US operations, three-quarters reported that engineers from their major customer made site visits to deal with production problems, and 97 per cent indicated that engineers from their major customer made site visits to deal with quality-control problems.

Joint product development. Joint participation in design and development is another key characteristic of Japanese supplier relations. Fifty per cent of suppliers in the 1988 survey reported they participated closely with assemblers in the development of new products. This included interaction with US-owned firms as well. Our field research found that Honda engineers, for example, developed new production techniques for a small Ohio plastics firm that became a Honda supplier. Honda, Toyota, and SIA sent teams of engineers and shopfloor workers to consult with suppliers on new product designs and production machinery. Other transplants, particularly Honda, established R&D and technical centres to integrate both transplant and US suppliers into the future design of cars. Based on this we are led to conclude that key elements of Japanese-style supplier relations—e.g. high levels of interaction, joint development, and long-term contracts—which typically have been

viewed as a function of Japan's socio-cultural environment, are actually a product of the organizational relation itself and thus reflect the capability to transfer organizational practice between environments.

Supply chain management. In Japan, first-tier suppliers play a critical role in organizing and coordinating supply flows between lower-level suppliers and main assembly plants. They are located close to assemblers, interact frequently with them, and often are at least partially owned by them (Asanuma 1985). First-tier suppliers were, if anything, more important in transplant complexes. For example, our field research found that the windscreens for Honda's American-made vehicles originated at PPG, an American producer. PPG supplied windscreens to a Japanese supplier, AP Technoglass, twice a week. AP Technoglass screened them for defects, cut and ground them, and delivered them to a Honda subsidiary, Bellemar Parts, twice a day. Bellemar, located one mile from the Honda plant, applied rubber seals to the windscreens and made just-in-time deliveries to Honda every two hours. Bellemar also screened for defects, so that Honda received higher quality windscreens than it would without its suppliers. In this way, first-tier suppliers serve as a buffer between assemblers and the environment.

Table 10.4 focuses on relationships across the transplant supply chain. As these data show, second-tier suppliers, who supply to the first-tier suppliers, have less interaction in design or development of new products. The 1988 supplier survey found that one-third of first-tier suppliers integrated second-tier suppliers in new product development. Just 43 per cent of the first-tier suppliers received just-in-time deliveries from their second-tier suppliers, whereas in Japan, tight supplier relations extend to second- and third-tier suppliers. In related field research on the steel industry, we found that such interactive customer—supplier relations were being extended down through the hierarchy to producers of basic inputs like steel and automotive plastics (Florida and Kenney 1992a, 1992b).

US suppliers to the transplants. The 1988 research explored the role of US-owned suppliers to the transplants. At that time, over half of Mazda's US suppliers were US-owned firms: forty-three of Mazda's ninety-six suppliers were independent US-owned firms, ten were owned by Ford, and forty-three were Japanese-owned or Japanese—US joint ventures (*Automotive News* 1989). Helper (1990) indicated that 41 per cent of 437 US automotive suppliers surveyed supplied at least one component to the transplants.

We found that transplant assemblers developed a variety of linkages to US producers. As in Japan, Toyota established an organization of its Kentucky suppliers, the Bluegrass Automotive Manufacturers Association (BAMA), and has held meetings with US suppliers in both the USA and Japan to encourage diffusion of Japanese practices. NUMMI organized a supplier council of seventy mostly US-owned suppliers to share information-sharing and facilitate product improvement (Krafcik 1986, 1989). SIA has organized teams of engineers, purchasing representatives, and manufacturing experts who work with suppliers to improve quality. Johnson Controls, an American-owned automotive supplier in Georgetown, Kentucky, became the sole source supplier of seats for the Toyota Camry. Toyota worked with the

company to implement a full-blown Japanese production system. Johnson Controls delivers completed sub-assemblies to Toyota according to just-in-time requirements every four hours. We visited a ten-person small machine shop in rural Ohio that formerly rebuilt tractor engines, but now rebuilds robot heads for Honda and Honda suppliers.

5.2. Change over time: 1994 findings on inter-organizational relationships

The findings of the 1994 survey reinforce and extend the findings of the earlier fieldwork and survey research (see Tables 10.5 and 10.6). The 1994 findings indicate that inter-organizational factors (e.g. customer-supplier relations) form a catalytic mechanism in the diffusion and transfer of organizational forms and practices. The 1994 fieldwork found that both OEM manufacturers and first-tier supplier were actively engaged in efforts to diffuse innovative organization through supplier networks. Toyota, for example, provided technical assistance to its suppliers through its purchasing departments, and set up a semi-independent operation, the Toyota Supplier Support Center, to work with US-owned suppliers that are committed to adopting core values and practices of the Toyota production system. Toyota also established two US-based supplier associations—associated with its Georgetown, Kentucky, and NUMMI plants, respectively—to accelerate the adoption and diffusion of innovative organizational practices among its suppliers.

TABLE 10.5 Adoption of organizational practices by country of ownership

	Auto parts supplier plants in the USA (1994)			F	Pr>F
	Japanese-owned	US Japanese joint ventures	US-owned		
Teams: % of plants	75.8	78.0	74.2	—	—
Teams: % of participation	47.6	57.9	44.3	1.7	0.19
Team of authority index	2.2	2.2	2.5	0.9	0.4
Self-directed teams: % of plants	50.2	47.5	56.3	—	—
Self-directed teams: % of participation	32.9	41.1	34.6	0.6	0.55
Quality circles: % of plants	32.9	41.1	34.6	—	—
Quality circles: % of participation	42.6	36.9	37.8	0.6	0.5
Group incentive pay (e.g. gain-sharing): % of plants	11.4	24.0	14.0	—	—
Profit-sharing: % of plants	49.5	58.7	52.9	—	—
Pay for skills: % of plants	50.4	41.1	48.7	—	—

Notes: % of plants' indicates the percentage of plants in the given sample that use the given practice. % participation' indicates the percentage of production workers in a plant who are involved in the given practice. For none of these variables is the difference of means among the various ownership types statistically significant by a one-way ANOVA test.

Source: 1994 survey by Richard Florida and Davis Jenkins, Carnegie-Mellon University.

TABLE 10.6 Experience with organizational practices by ownership (in years)

Variable	Japanese-affiliated plants not in auto supply	Japanese-affiliated auto supplier plants	US-owned auto supplier plants	F	Pr>F
Teams	5.0	5.0	5.5	0.1	0.87
Quality circles	4.5	3.8	5.9*	3.9	0.02
TQM: years' experience	3.3	3.3	4.3	1.9	0.15
Tenure of mgmt. regime: years	7.5	6.3	18.2**	76.8	0.0001
Age of plant: years	15.9	15.1	28.2**	19.3	0.00001

* Difference of means statistically significant at $p < 0.05$ by one-way ANOVA test.

** Difference of means statistically significant at $p < 0.01$ by one-way ANOVA test.

Source: 1994 survey by Richard Florida and Davis Jenkins, Carnegie-Mellon University.

We conducted a number of empirical analyses to examine the relationship between innovative organizational systems inside the plant and innovative customer–supplier relations. Basically, we found evidence of a strong connection between intra- and inter-organizational practices. In the automotive sector, in particular, the adoption of innovative intra-organizational practices was linked to a propensity to work closely with suppliers to improve product quality, delivery, and cost. This led us to conclude that customer–supplier relationships reinforce innovative organizational practices and, in the automobile sector at least, provide a mechanism for diffusing innovative work and production organization throughout a tightly linked customer–supplier network (see Jenkins and Florida 1998).

We also examined the effect of certain aspects of customer–supplier relations (such as supplier certification and electronic data interchange) on the adoption of innovative organizational systems (Jenkins and Florida 1998). Here, we found that certification by customer was associated with a greater likelihood of adopting innovative organizational systems only for US-affiliated automotive suppliers to the transplants. Similarly, US-owned automotive supplier plants that certify their suppliers were significantly more likely to adopt innovative organizational systems. It seems that US automotive supplier plants figured out how to integrate supplier certification activities into a strategy that includes the adoption of innovative organizational systems within the plant. Japanese automotive transplant suppliers were more likely to use electronic data interchange (EDI). Furthermore, EDI was associated with the tendency to adopt innovative organizational systems only for the Japanese-affiliated automotive parts suppliers. Japanese-affiliated automotive supplier plants that have EDI with their customers were significantly more likely to adopt innovative intra-organizational practices. Japanese-affiliated automotive suppliers thus appear better able to integrate electronic data interchange into a production system that both emphasizes information-sharing within the factory and rich communications and cooperation with supplier and customer organizations.

Interaction with local organizations. The 1994 study explored the adoption and diffusion of innovative organizational practices among US-affiliated automobile parts plants that serve as first-tier suppliers to Japanese transplant automotive assemblers, focusing on two key questions. Were there differences between the transplants and US-affiliated establishments in the rates of and reasons for adoption of organizational innovations? Did supply relationships with Japanese transplant producers accelerate the adoption of innovative practices by US automotive component suppliers? Cusumano and Takeishi (1991) found some evidence that transplant producers managed to help or at least persuade their suppliers in the USA, both US-affiliated and Japanese-affiliated, to meet Japanese standards for quality and pricing in a survey of purchasing managers at Japanese automotive assembly transplants. However, they concluded that the overall high-quality performance of suppliers to the transplant assemblers reflects more the transfer of Japanese suppliers to the USA than improvement in the capacity of USA-affiliated suppliers through the transfer of managerial skills to those firms.

The findings of the 1994 study indicated that US suppliers to the transplants were quite innovative (see Table 10.5). First, we found little difference in adoption of innovative organizational systems between Japanese-affiliated and US-owned suppliers to the Japanese transplant automobile assemblers. In fact, a slightly higher proportion of US-owned suppliers utilized innovative organizational practices (e.g. teams and so forth), although this difference was not statistically significant. The US-owned supplier sample also included a larger group of traditional or Taylorist establishments. To probe this further, the 1994 study also conducted econometric analyses (multinomial probit models) of the factors that account for the adoption of innovative work and production practices by US automotive suppliers to the transplants and their Japanese counterparts (see Jenkins and Florida 1998). We explored the effects of employment size, capital intensity, wages, education levels, unionization, customer (transplant versus Big Three), and supplier relations on the adoption of innovative work and production practices. The results of this analysis indicated that, for the US-owned automobile suppliers, having a Japanese transplant assembler as a plant's most important customer, was not by itself associated with a greater likelihood that the plant would adopt innovative organizational practices.

We also looked at the timing of adoption of innovative work and production systems for US-owned and transplant suppliers. The results of the 1994 study indicated that US-owned suppliers had on average been using these practices longer than Japanese-affiliated plants—by at least a year for each practice (see Table 10.6). We were especially struck by how recent the adoption of innovative organizational practices was across the entire 1994 sample both Japanese-affiliated or US-owned. The average time that plants were using such practices was 3.5-5 years, with 1989-91 being the peak period for adoption. Plants in the sample were involved with teams the longest on average, followed by quality circles and TQM. The only exception was US supplier plants, which used quality circles for an average of six years compared to only three-and-a-half years for Japanese-affiliated automotive suppliers (Jenkins and Florida 1998).

In short, the 1994 findings reinforce the earlier finding that inter-organizational relationships play a key role in the transfer and adoption of intra-organizational practices (see Jenkins and Florida 1998; Florida and Jenkins 1999). Organizational transfer, in the case of Japanese transplants, is far more likely in industries with tight supplier chains and close interaction across the production chain. Indeed, the high rate of adoption appears to be reinforced by uniquely close and interdependent supplier relations required for integration in the automotive sector. This supports the hypothesis that close inter-organizational relationships affect the adoption of organizational innovations both directly through direct customer requirements and indirectly through learning and emulation. In the automobile sector especially, Japanese transplants have sought to replicate in the USA tightly linked inter-organizational relationships associated with automotive production in Japan. In this sector, there is a strong association between adoption of innovative organizational systems inside the factory and close and interactive inter-organizational relationships. This reinforces the earlier finding from the 1988 study of an isomorphism between intra- and inter-organizational innovations.

6. Conclusion

This chapter has explored the capability of organizations to transfer and replicate practices in different environments, examining the case of Japanese automotive transplants in the USA. Traditionally, organizational theory suggested that such transfer was difficult and that organizations tended to adapt to the conditions of their surrounding environments. To shed light on this issue, we examined the transfer of organizational practices in a large sample of Japanese transplants, reporting the results from two national survey studies as well from detailed field research on the Japanese automotive transplants conducted in 1988 and 1994 respectively.

Generally speaking, the findings from our studies support the view that organizations (in this case Japanese automotive transplants) possess the capabilities to transfer and replicate key practices in a new environment (in this case the USA). Our findings indicate that both transplant assemblers and suppliers have been remarkably successful in the transfer and replication of organizational forms and practices. Key elements of so-called Japanese work organization in the automotive industry have been transferred to transplant organizations in the USA. We also found, however, that there were differences in the extent to which the transplants were able to replicate actual worker behaviour within these organizational forms and practices. Furthermore, we found evidence that other practices such as wage determination and labour relations practices were modified to fit the US context. We also found that the transplants effectively recreated key elements of the inter-organizational practices (e.g. end user—supplier relationships) in the USA.

Our findings thus lend support to the hypothesis that organizations possess the capability to transfer and replicate key organizational forms and practices from one environment to another. Certainly, our analysis of Japanese transplant organizations provides evidence that certain organizational practices were removed from the

Japanese environment and successfully implanted in the USA. However, we do not imply that the process of transfer and replication is somehow natural or automatic. Rather, we found that organizations in this study expended considerable resources to the transfer process, acting purposefully and strategically to select and even to alter the environment to make it conducive to new organizational forms.

Our findings may come as a surprise, given the legacy, conceptual orientation, and predictions of industrial sociology and organization theory. These theories imply that the environment has a determinant effect on organizational form and structure, that it is difficult to transfer and replicate organizational characteristics between dissimilar environments, and that once transferred, organizations take on the characteristics of the new environment. They, thus, minimize the importance of organizational resources and capabilities in this process. The transplants in our sample effectively recreated many of the critical key elements of work organization and supplier relations. Our findings lend considerable support to the view that certain classes of organizations possess the resources and capabilities to transfer and replicate key practices across environments.

Our findings also indicate that there is a symmetry of sorts between intra- and inter-organizational practices. The Japanese transplants have replicated long-term, interactive, participative, and/or mutually dependent relations at both the intra- and inter-organizational levels. These findings are not specific to the transplants but are reflected in comparative institutional research—the US pattern of short-term adversarial labour—management relations was reflected in the short-term arm's length pattern of US supplier relations. We believe that there may be an underlying rationale for such symmetry. Organizational pressures and incentives may lead to increasing continuity in the governance structures inside and outside the firm. Firms that effectively organize intra-organizational activity are likely to replicate it in dealings with external firms as well. More research and theory-building are needed on this crucial issue, using other sectors, industries, and types of organizations.

Our research indicates that organizations can and do shape their environments. Thus, the concept of environmental embeddedness should be revised to incorporate measures of the power, intentions, and purposeful activities of organizations. Transferring organizational practices and forms from one society to another means that they must be uncoupled from the environment in which they are embedded and recreated in the new environment. The transplant organizations examined here provide clear evidence that organizational forms can be effectively lifted from an originally supportive context and transferred to a foreign environment. Furthermore, they show that organizations can shape aspects of the new environment to meet their functional requirements. In general terms, then, we are led to conclude that organizations possess the resources and the capabilities to alter the environment. Acting strategically and purposefully, we conclude that organizations possess the resources and capabilities to transform the social matrix of the environment. Furthermore, we find that successful organizational transfer is neither natural nor automatic; it hinges on the strategic action organizations take to shape the environment to meet their requirements.

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