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Bayari, Celal

Nagoya City University Graduate School of Economics

1 June 2010

CITATION

Bayari, Celal (2010) 'Japanese Manufacturers in Australia: Analysing Their Quality Evaluation and Employee Participation.' *13th Annual Convention of Japanese Association of Administrative Science Proceedings*. pp. 369-374. 12-14 October. Hyogo Prefectural University. Kobe. Japan. 2010.

Japanese Manufacturers in Australia:
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Celal Bayari
Nagoya City University Graduate School of Economics

1. Introduction: The characteristics of Japanese transnational automotive and electronic manufacturers in their overseas operations form a major topic of analysis (see Abo 2007a, Kumon and Abo 2004). This paper discusses the data from Japanese electronics and automotive (auto and auto parts) manufacturers that were subjects of the author's research in Australia.[1] Dunning's 'eclectic paradigm' has been applied, as a theoretical framework of transnational behaviour, to the previous analyses of Japanese manufacturers in Australia (Edgington 1990, Nicholas et al. 1996, Purcell et al. 1999). The concentration of foreign investment by the transnationals of a country in the host is primarily a manifestation of their respective gross domestic products and the bilateral trade (Dunning et al. 2007). Foreign direct investment has a reciprocal connection with local conditions (Dunning 2007: 21).

Australia enjoys a continuous trade surplus with Japan (Bayari 2004). In the last decade Japanese direct investment in Australia has fluctuated but has mostly risen (Bayari 2008) which means that it will remain a topic of interest for analysts. Japan remains the third largest foreign investor in the Australian market and over 44 per cent of its total investment is direct investment (ABS 5352.0 2010). The Japanese system is grounded upon the establishment of a range of skills among employees in a small-lot and mixed model production (Kumon 2004: 4). Japanese manufacturing corporations' subsidiary and headquarters relationship is quite differentiated in comparison to the corporations of other nations (Harzing and Noorderhaven 2006b). Japanese transnationals depend on the management style of their parent companies (Yoshihara 2005: 259).

The Japanese system of management and production is adaptable to foreign environments (Abo 2007a: 2). Organisational advantages of firms of one nationality can be transferred to their affiliates in another country (Dunning 2006: 217). Abo defines Japanese factories outside Japan as 'hybrid factories' because as the Japanese system is adapted to a foreign environment it is modified in the process (2007a). The Japanese system was transplanted into the UK and the US from the 1980s onwards with the establishment of such hybrid factories (see Dunning and Lundan 2008: 136-138). The same process began in Australia in the 1960s when several Japanese manufacturers began entering the market and establishing factories. Table 1 provides a sample list of five manufacturers and compares their establishment dates in Australia with those in the UK and the US.

Table 1: The overseas expansion of Japanese automotive and electronics manufacturers

	Australia	**UK**	**US**
Toyota Motor Corporation	1963	1992	1984 (NUMMI), 1988 (TMMK)
Mitsubishi Motors Corporation	1978	not applicable	1988
Nissan Motors Company Limited	1966	1986	1983
Matsushita Electric Industrial (Panasonic)	1969	1976	1979
Sharp Corporation	1975	1985	1979

2. Automotive and electronics industries in Australia: Australia's industrial structure is primarily an off-shoot of foreign transnational corporations, mostly American, British and

Japanese (Nicholas et al. 2003: 7). Most of the auto parts and electronics factories and all of the auto makers are foreign owned entities.
Australia once housed ten foreign auto manufacturers including Nissan, Mitsubishi, Volkswagen, Chrysler and Leyland. Toyota Motor Corporation Australia, Ford Australia and GM Holden are now the only auto manufacturers in Australia. The industry contains over 200 auto parts manufacturers (Drysdale 2010: 28). There are over 500 tooling and services firms that support the entire automotive sector (Automotive Australia 2010: 5). The automotive industry is the largest manufacturing sector in Australia (Bayari 2008). The industry is worth approximately A$6 billion, employs over 50,000 people, with A$3.2 billion worth of exports in 2009, which is a drop from A$5.8 billion in 2008 (DIISR 2010: 11-14).

The three auto manufacturers procure supplies locally as well as from overseas and the value of locally made supplies was A$3.2 billion in 2009 (DIISR 2010: 23). The electronics industry, by contrast, is a $7.2 billion sector, employs approximately 30,000 people in over 2,000 firms and exports A$3.6 billion worth of products (AEEMA 2007: 2). The electronics manufacturing sector relies on sub-contracted work from the automotive sector. Foreign manufacturers continue to invest in the Australian automotive sector. In 2010 the German firm Bosch decided to enter the industry to manufacture high tech braking systems (Heasley 2010).

Lifan, the Chinese auto manufacturer, has plans to assemble automobiles in Australia (Newton 2010). Denso, Aisin, Yazaki, Fuji Xerox, Nissan Casting, Daikin, Shinagawa, YKK and Toyo are some of the Japanese corporations that currently manufacture in Australia. The overall technology transfer from these corporations is at the high-end of the scale. Denso was the winner of the Supplier of the Year Award in 2007 and 2008 for its production of diesel fuel injection systems, engine cooling systems, air conditioning systems, instrument clusters and air intake systems. Fuji Xerox, another environment prize winner, has instituted ecologically sustainable management and production practices in its Sydney factory with a high skill and high-end technology base (Benn et al. 2006: 106-108).

3. Management's evaluation of quality - auto and auto-parts manufacturers: The dependency relationship between the main firms and suppliers is understood as part and parcel of the activities of Japanese manufacturers in Australia (FJCCIA et al. 2000). The Japanese system is essentially a 'Taylorist' work environment and thus the role of suppliers is crucial, and suppliers are evaluated according to their reliability (Dassbach 1994, Tamura 2006). Nicholas and Purcell study reports that Japanese manufacturers are satisfied by their suppliers in Australia (1998: 19). This was certainly the case with the electronics manufacturers in the author's sample (Table 2). In the collection of the data presented here, the author asked the respondents to evaluate the quality of five elements in their respective corporations' day-to-day operations (see Table 2). The respondents were asked to assign scores as: '1' ('satisfied'), '2' ('not applicable') and '3' ('unsatisfied').

Japanese electronics manufacturers use 'modular systems' while auto and auto-parts manufacturers utilise 'integrated systems' that imply differences in their labour management approaches (Boyer 2007: 217). In the automobile industry's 'integral-type' system, the designing and manufacturing of a product requires the fine tuned tight coordination of technologies by each member being involved in the process ranging from the designing the molds to the final stage of assembling and inspection, but in 'modular-type' production of electronics manufacturing ready-made parts are assembled on an as-needed basis (Abo 2007b: 15). As a result automotive sector is comparatively more supplier-dependent which may explain why 'auto and auto-parts' manufacturers in Australia are the least satisfied with 'local suppliers' products (parts) and

services' (Table 2). They are satisfied only with three of the five variables which are 'shopfloor employees', 'office employees' and 'local supervisors and managers' (Table 2).

4. Employee participation: Management performance of a transnational subsidiary is correlated with continued investment in training (Hood and Taggart 1999). The application of on-the-job-training as an element of the 'Japanese system' in overseas Japanese factories depends on the host country's conditions (Abo 2004b: 56). On-the-job-training inevitably takes time but the ultimate result is greater production efficiency and better product quality' (Kumon 2004: 4). Employee participation in a range of management and production practices within Japanese manufacturers in Australia has been studied previously (Nicholas et al. 1996, Purcell et al. 1999). Foreign manufacturers' subsidiaries in Australia rely strongly on participation in team based activities (Harzing and Noorderhaven 2006a). In the research survey, the data of which is presented here, the author also asked the manufacturers how many people participated in five different management and production practices. The respondents were asked to assign scores as: '1' ('many'), '2' ('a few') and '3' ('none'). Among the seven 'auto and auto-parts' manufacturers, more people participated in 'team/group work' than any other practice which shows the significant place team-based work holds in this sector (Table 3).

Table 2: Evaluation of quality

Auto and auto-parts manufacturers	**n**	**min**	**max**	**mean**	**std. dev**
shopfloor employees	7	1	3	1.00	0.00
office employees	7	1	3	1.00	0.00
local supervisors and managers	7	1	3	1.00	0.00
Japanese supervisors and managers	7	1	3	1.43	0.53
local suppliers' products (parts) and services	7	1	3	1.57	0.98
Electronics manufacturers	**n**	**min**	**max**	**mean**	**std. dev**
shopfloor employees	5	1	3	1.00	0.00
office employees	5	1	3	1.00	0.00
local supervisors and managers	5	1	3	1.00	0.00
Japanese supervisors and managers	5	1	3	1.00	0.00
local suppliers' products (parts) and services	5	1	3	1.00	0.00

Source: Author's data

'On the job training' programs have the second highest participation rate among 'auto and auto parts manufacturers.' Employee skills, attitudes and motivation all serve to mediate between management systems and corporate performance (Park et al. 2003). In Australia, on-the-job-training has by and large replaced the previously popular broad-based training in manufacturing (Cooney and Long 2010). The emphasis is given to on-the-job training more than other forms of training by foreign subsidiary manufacturers (Cooney and Sewell 2008).

Table 3: Employee participation in management and production practices in auto and auto-parts manufacturers

Auto and auto-parts manufacturers	**n**	**min**	**max**	**mean**	**std. dev**
on the job training programs	7	1	3	1.29	0.49
team/group work	7	1	3	1.14	0.38
multiple jobs/tasks	7	1	3	1.29	0.49
total quality control	7	1	3	2.14	0.69
ringi decision making	7	1	3	1.71	0.76
job evaluation	7	1	3	2.14	0.90
Electronics manufacturers	**n**	**min**	**max**	**mean**	**std. dev**
on the job training programs	5	1	3	1.40	0.55
team/group work	5	1	3	1.80	0.84
multiple jobs/tasks	5	1	3	1.80	0.84
total quality control	5	1	3	2.20	0.84
ringi decision making	5	1	3	1.80	0.84
job evaluation	5	1	3	2.20	0.84

Source: Author's data

On-the-job-training is correlated to 'community of fate' development at workplace (Ashton 2004). Among the electronics manufacturers, 'on the job training programs' is the most participated practice (Table 3). A further point which will have to be the topic of another paper is that 'total quality control' has the lowest score in both electronics and automotive manufacturers. The size of the sample in this discussion is small but it does show that the two groups display some differences as well as similarities. This result can be compared to data from other researchers in a descriptive manner. In this instance the paper provides a brief discussion of JMNESG (Japanese Multinational Enterprise Study Group) data from the UK and North America (see Abo 2007a: 3).

5. The UK and North American data: Japanese automotive and electronic manufacturers display similar patterns in their overseas factories (Kosaka 2004: 295-296). Data from JMNESG, which is led by Tetsuo Abo, provides comparisons of Japanese overseas factories, especially in the automotive sector (Abo 2007a, Kumon and Abo 2004). There is some level of correspondence between their results and the author's data. Different terminologies and scoring systems are used but the discussion topic is the same. In the author's research survey sample of 'auto and auto-parts' makers, the variable of 'local suppliers' products (parts) and services' has the lowest score (Table 2). In the UK and North American data, 'procurement' [of parts and supplies] has the lowest score (Table 4). Japanese automotive manufacturers, it appears, are dissatisfied with their suppliers in the UK, the US and Australia. In the final analysis, what these descriptive statistics signify is that the data from these three markets emphasise the same elements.

Table 4: Japanese automotive manufacturers in the UK and North America

Variable Name	N. America 'auto'	N. America 'auto parts'	UK 'auto'	UK 'auto parts'
Work organisation/administration	3.3	3.1	3.8	3.3
Production control	3.4	3.6	3.3	2.9
Procurement	3.0	3.0	1.9	1.9
Team sense	3.9	3.8	3.3	3.3
Labor relations	4.2	4.1	3.7	3.4
Parent subsidiary relations	3.5	4.2	2.6	2.5

Source: JMNESG data base - North America (2001), the UK (1997) quoted in Kamiyama (2004: 106-107). These scores are not percentages.

6. Conclusion: The discussion above has shown that Japanese manufacturers in Australia display unambiguous characteristics. This is the main conclusion that can be drawn from assessing the way in which the respondents evaluated the quality of the five variables defined above. Moreover, the levels of employee participation in management and production practices also draw an interesting picture. The differences between electronics and automotive manufacturers which may well be due to (apart from the obvious difference in the nature of the respective industries) the time-period in which these factories were established and their technology levels. The age of the plant and the management team are both relevant factors (Boyer 2007: 218). The data from the automotive factories in Australia appears to draw a similar picture to the data from the UK and North America. These issues can be addressed with further research with larger data sets, especially in respect to the issue of data comparability.

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