Macrothink Institute™

World Journal of Business and Management
ISSN 2377-4622
2016, Vol. 2, No. 2

Applicability of Japanese Management and Production System in Africa: Using "Hybrid Evaluation Model" in Comparison with Other Developing Regions

Wooseok Juhn

School of Management, Chukyo University, Japan

E-mail: wjuhn@mecl.chukyo-u.ac.jp

Tetsuo Abo

Institute Of Social Science, Emeritus Professor

University of Tokyo, Japan

Received: June 9, 2016 Accepted: July 13, 2016 Published: August 1, 2016

doi:10.5296/wjbm.v2i2.9577 URL: http://dx.doi.org/10.5296/wjbm.v2i2.9577

Abstract

The purpose of this paper is to illuminate the overall features of the Japanese management and production systems transferred into the industries in Africa, in order to examine its possibility of contribution to economic development in Africa. The most remarkable finding is that the African culture and social environment would be more or less compatible to Japanese style HRM. "Worksite–oriented" Japanese style management has been realized in various work practices not only at the local plants of Japanese firms but also of African firms under some institutional restrictions, i.e. strong labor unions and European type rigid social frameworks. For Japanese companies that are thinking of the investment in Africa, we could clarify the environment of Africa might be familiar to the Japanese management and production systems. Simultaneously, for the governments of the countries in Africa, this paper suggests that the JMPS could be one of the effective methods to develop the economy of their countries. This is the first time research approach to the transferability of the Japanese management and production systems based on the field research in Africa.

Keywords: Japanese management and production systems, Hybrid evaluation model, application, adaptation, Africa

1. Introduction

Since the end of twentieth century, Japanese management and production system has been considered as one of the most efficient and best practice in managing the organization (Oliver & Wilkinson, 1988; Womack et al., 1990; Kenny & Florida, 1994; Abo, 1994). In this paper, the authors are going to illuminate the overall features of the Japanese management and production system put into practice in the manufacturing industry in Africa, based on surveys performed by the Japanese Multinational Enterprise Study Group ("JMNESG"), of which the authors are the members.

JMNESG has been doing field research since 2009 onward in the following African countries: Northern region (Egypt, Morocco, and Tunisia), Southern region (South Africa, Swaziland, Zimbabwe and Mozambique), Eastern region (Tanzania, Kenya and Madagascar), and Western region (Nigeria) (Note 1). Our main concern is regarding the transferability of the Japanese management and production system in Japanese-affiliated factories in Africa, but we also have an interest in finding some aspects of the Japanese system in the affiliated factories of Western multinational companies and indigenous local firms in Africa. Surveys of JMNESG in Africa and analysis of the survey findings are both still in progress at the time of this writing. This paper is a kind of an interim report for the findings of 2009-2010 surveys.

"Hybrid Evaluation Model (an application-adaptation analysis model)" is used to evaluate and quantify the transferability and practicability of the Japanese management and production system in Africa. JMNESG had already carried out 10 full-scale research projects in 8 regions across 30 countries of the world: North America (1989 and 2000-2001), Latin America (2001 and 2006), Korea and Taiwan (1992), Southeast Asia (1993), China (2002), the United Kingdom (1997), Continental Western Europe (1998), and Central and Eastern Europe (2003) (Note 2). In those research projects that have been ongoing for more than 20 years, JMNESG has completed on-site surveys of about 500 factories using the Hybrid Evaluation Model, mainly in the fields of automobile, electronics and machinery industry. Most of them are Japanese-affiliated factories, but also the factories operated by multinational enterprises based in Europe and the US, as well as by indigenous local firms are included. In all of the Japanese-affiliated factories in the world, we could find the mixtures between Japanese and local elements, so we call them "Hybrid Factories (Note 3)".

At first, we will analyze the characteristics of the Hybrid Factories in Africa, in comparison with the Hybrid Factories in other regions, especially in other developing regions such as Southeast Asian, Latin American or Central and Eastern European countries. Then we will introduce two case studies: a typical Japanese style HRM in South Africa (Komatsu) and a unique multi-brand automobile production operation in Kenya (AVA). Thus the final purpose of this paper is to investigate, in comparison to other developing regions, how and to what extent Japanese type management and production technologies and know-how can contribute to the economic and management development in Africa, "the last frontier" in the world economy.

2. Hybrid Analysis of Japanese Plants in Africa

2.1 The Hybrid Evaluation Model

"Hybrid Evaluation Model", developed by JMNESG, specifies 23 constituent elements of the Japanese production system (see Table 1). These elements, divided into six groups, take account of the distinctive characteristics of the Japanese system by covering not only the functional aspects of the production site, but also the human-related managerial (HRM) and systemic aspects. Application of the Japanese system is not only about the transfer of *Method* (procedures), but also about the carrying in of readymade *Results* which actually embody aspects of the Japanese system, such as Japanese expatriates, equipment made in Japan, or parts and components made in Japan.

Evaluation criteria have been defined for measuring the degree of application, on a five-point scale, of the various elements comprising the Japanese system (Note 4). A higher score means a stronger level of *application* (bring in) of the Japanese system element, while a lower score means a stronger level of *adaptation* (modification to suit local conditions, or replacement with local practices or resources). For instance, if an overseas factory is found to have implemented a certain factor of the Japanese system 100 percent, an application score of "5" (meaning zero modification) will be given to that factory, while an application score of "1" (meaning 100 percent modification into the local system) will be given if no transfer of Japanese factors has been made (Note 5).

The scores are based on data gathered during half-day or one-day interview surveys at each factory. Scores are determined jointly by all members of the research group. Given that the scores are based on uniform evaluation criteria, and all of the scoring is done by the same standing group, this analytical model virtually excludes the type of subjective factors that tend to affect five-point evaluations based on questionnaire surveys, and also has very high comparability among control samples.

For comparison between Hybrid Factories in Africa and in other regions, included were 289 Japanese-affiliated factories (including the 19 factories in Africa), for which the Hybrid Evaluation Model has been used to analyze the transferability of the Japanese system. Because the surveys and analyses were conducted across a period of some two decades, it is not possible to make contemporary comparisons among the regions. Certainly the survey results for each region strongly reflect particular regional characteristics. Furthermore, the chronological differences may introduce some bias. Accordingly, for the North America region where the group completed two large-scale surveys separated by an interval of more than a decade, the analysis here refers separately to North America (1989) and North America (2001).

2.2 Aspects of the Application of the Japanese System in Africa

This analysis covers 19 factories in 14 companies where JMNESG conducted on-site surveys from 2009 to 2015. Broken down by industry, they comprise six auto assembly plants operated by five companies, including three CKD (complete knock down) plants; seven auto parts factories operated by four companies; one bike assembly plant; one electrical products

factory; and four other factories operated by a single company. Broken down by location, they comprise six factories in North Africa (two each in Egypt, Tunisia, and Morocco), two in East Africa (one each in Kenya and Tanzania), one in West Africa (Nigeria), and ten in Southern Africa (one in Zimbabwe, one in Swaziland, eight in South Africa).

Figure 1 shows the provisional degrees of application in Africa of the 23 elements of the Japanese production system, categorized in six groups in the Hybrid Evaluation Model (See also Table 1). For purposes of comparison, Figure 1 also shows the degrees of application for eight other regions of the world. As an initial observation, the aggregate average for the 23 elements in Africa is slightly lower than, but does not differ greatly from, the world average. Thus a version of system transfer has indeed been realized on the African continent. In terms of the six groups, the scores for groups I Work organization and administration (3.2), II Production control (3.2), IV Group consciousness (3.3), and V Labor relations (3.3) are in line with the world averages (I: 3.2, II: 3.3, IV: 3.1, V: 3.3); the score for group III Procurement (3.3) is higher than the world average (2.9); and the scores for group VI Parent-subsidiary relations (2.6) are below the world averages (2.8). Following are the breakdowns of the degrees of application for each group in terms of the 23 elements of the Japanese system (See Table 1).

First, within group I Work organization and administration, which on the whole matches the world average, the lower score for Job classification (i.e. more job classifications) and higher score for Multifunctional skills can be seen as offsetting each other. The low score of application in job classification matches that for Continental Western Europe (1998), and may well be attributable to the influence of the long European colonial history in Africa. A similar situation was found in Latin America (2006), another area of former European colonization.

However, some supplementary explanation is in order regarding the high score for job classification (i.e. less job classifications) in the UK (1997), the former colonial ruler of Kenya, Zimbabwe and South Africa. The Thatcher governments of the 1980s introduced far-reaching economic reforms, bringing about the relaxation of institutional restrictions, which in turn enabled broader application of Japanese-style less job classifications. In Africa, on the other hand, the low application score seems consistent with the survival of earlier British-style practices.

Another characteristic of the African situation is the extremely high application scores for Multifunctional skills and First-line supervisor (Note 6). The score for multifunctional skills is second only to the UK (1997), and the score for first-line supervisor is high comparing to other regions. These scores were likely influenced by the presence of 4 CKD factories among the 19 factories surveyed, and the fact that on the whole, most of the work done in these factories is rather simple. The low application scores for most of the items in group II Production control are consistent with this pattern.

On the other hand, when the above findings are considered together with the low application scores for the element Harmonious labor relations (described below), they suggest, interestingly, that even though Africa tends to have institutionalized restrictions inherited from Europe, the Japanese-style flexible management is possible. In fact, at most of the

Japanese-affiliated factories, regardless of finely specialized titles, on the job the operators and supervisors showed very little sense of compartmentalized responsibilities. A uniquely African sense of Brotherhood also appeared to be operative. For example, engineers in European regions often met strong resistance to cooperation from line workers, while in Africa such resistance has rarely been observed.

Table 1. Global comparison of hybrid evaluation model scores

	n=19	n=34	n=37	n=35	n=20	n=32	n=29	n=24	n=35	n=24	n=289
	Africa	North America ('89)	North America ('01)	Latin America ('06)	UK ('97)	Conti. Western Europe ('98)	Central & E. Europe ('03)	Korea & Taiwan ('92)	S.E. Asia ('93)	China ('02)	World Average
I Work Organization and Administration	**3.2**	**2.9**	**3.2**	**3.1**	**3.4**	**3.0**	**3.3**	**3.7**	**3.3**	**3.5**	**3.2**
1. Job classification	3.5	3.7	4.1	3.6	4.4	3.2	4.1	4.9	4.5	4.4	4.0
2. Multifunctional skills	3.2	2.6	3.1	2.9	3.3	2.8	2.8	2.9	2.6	3.0	2.9
3. Education and training	3.2	2.9	3.7	3.3	3.5	3.1	3.4	3.4	3.3	3.5	3.3
4. Wage system	2.7	2.4	2.2	2.7	2.8	2.8	2.9	3.9	3.1	3.4	2.8
5. Promotion	3.3	3.1	2.9	3.3	3.4	3.1	3.3	3.7	3.1	3.4	3.2
6. First-line supervisor	3.3	2.9	3.2	3.1	3.4	3.1	3.2	3.4	2.9	3.3	3.1
II Production Control	**3.2**	**3.3**	**3.4**	**3.4**	**3.5**	**3.2**	**3.3**	**3.5**	**3.4**	**3.3**	**3.3**
7. Equipment	3.6	4.3	3.9	4.0	3.9	3.1	4.0	3.5	4.0	3.8	3.8
8. Maintenance	2.8	2.6	3.1	2.9	3.0	3.3	2.8	3.3	3.0	3.1	3.0
9. Quality control	3.2	3.4	3.4	3.4	3.6	2.8	3.0	3.6	3.2	3.2	3.3
10. Process management	3.1	3.0	3.5	3.4	3.6	3.2	3.4	3.5	3.2	3.3	3.3
III Procurement	**3.3**	**3.0**	**2.6**	**2.9**	**2.5**	**2.8**	**2.6**	**3.2**	**3.2**	**3.0**	**2.9**
11. Local content	3.9	2.7	1.8	3.0	1.9	3.3	2.2	2.9	3.1	3.0	2.7
12. Suppliers	3.5	3.9	2.9	3.2	2.7	2.9	2.8	3.5	3.8	3.3	3.3
13. Procurement method	2.4	2.5	3.1	2.5	2.9	2.8	2.7	3.2	2.8	2.8	2.8
IV Group Consciousness	**3.3**	**3.2**	**3.3**	**3.2**	**3.3**	**3.1**	**2.8**	**3.4**	**3.2**	**3.0**	**3.1**
14. Small-group activities	2.7	2.5	2.6	2.9	2.7	2.9	2.0	3.2	2.9	2.6	2.7
15. Information sharing	3.6	3.6	3.6	3.3	3.6	2.8	3.2	3.5	3.3	3.1	3.3
16. Sense of unity	3.6	3.5	3.7	3.4	3.7	2.8	3.2	3.6	3.3	3.4	3.4
V Labor Relations	**3.3**	**3.6**	**3.7**	**3.3**	**3.5**	**2.8**	**3.3**	**3.4**	**3.1**	**3.1**	**3.3**
17. Hiring policy	3.2	3.4	3.6	3.3	3.3	2.6	3.2	3.0	3.1	2.9	3.2
18. Long-term employment	3.5	3.4	3.5	3.5	3.4	2.9	3.0	3.3	3.0	3.0	3.2
19. Harmonious labor relations	3.1	4.4	4.2	3.1	4.2	2.8	3.8	4.0	3.3	3.7	3.7
20. Grievance procedure	3.2	3.3	3.7	3.2	3.0	3.2	3.3	3.2	3.1	3.0	3.2
VI Parent-Subsidiary Relations	**2.4**	**3.6**	**2.8**	**2.3**	**2.8**	**3.1**	**2.8**	**2.3**	**2.9**	**2.7**	**2.8**
21. Ratio of Japanese expatriates	1.5	3.7	2.1	1.2	2.4	3.2	1.7	1.5	1.6	1.8	2.1
22. Delegation of authority	3.2	3.6	3.1	2.5	3.0	3.3	3.1	2.7	3.2	3.0	3.1
23. Position of local managers	2.6	3.6	3.1	3.1	3.0	3.4	3.4	2.7	3.8	3.2	3.3
Average Rate	**3.1**	**3.3**	**3.2**	**3.1**	**3.2**	**3.0**	**3.1**	**3.3**	**3.2**	**3.2**	**3.2**

Note. Light blue shaded parts are at least 0.2 higher than the world average, and yellow shaded parts are at least 0.2 lower than the world average.

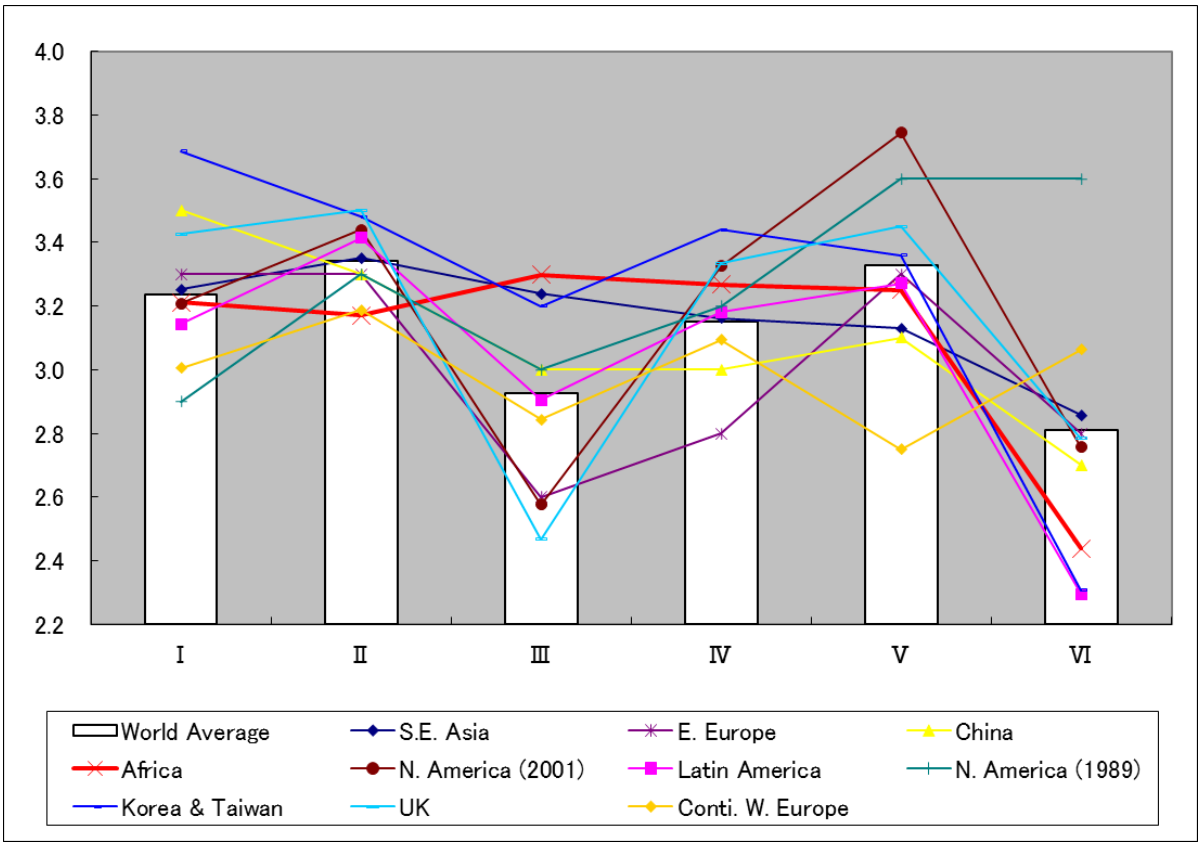

Figure 1. Regional comparison for the six groups of Japanese system elements

A further characteristic of the African hybrid pattern is above-average scores for system application in group III Procurement. Within this group, there were very high scores for the elements Local content and Suppliers (Note 7), indicative of the *Result* transfer, and in contrast a rather low score for Procurement method (for example, Just-In-Time procurement), indicative of the *Method* transfer. In every region of the world, the highest scores for application of the Japanese system were those for Local content and Suppliers. Yet Japanese-affiliated factories in Africa exhibit unusually high reliance on imported parts and components. It may be that there is a lack of suitable suppliers in Africa due to the continent's generally weak industrial infrastructure. Yet in contrast, another feature of African hybrid factories is that imports of production equipment are not very high (i.e. low score for the element Equipment). This implies that the level of manufacturing in Africa is more or less limited to perform simple assembly operations on readymade parts obtained from parent companies in Japan or their production affiliates elsewhere in Asia, in the absence of large-scale investment to the advanced or automated production equipment.

Another regional characteristic of Africa is especially low score for Harmonious labor relations in Group V Labor Relations, which had a lower score only in Continental Western Europe (1998). This is likely due to the existence of very combative industrial labor union organizations. As with the job classification situation discussed above, this could well be due

to European influence. In South Africa in particular, the solidarity of the black population during the successful struggle for freedom in recent decades seems to continue as a functional awareness of cohesion that carries over into all aspects of life. In addition to strikes during scheduled wage negotiations, illegal strikes are frequent. Labor issues are clearly one of the most important topics for business expansion in South Africa.

Finally, for group VI Parent-subsidiary relations, a low score is observed. This is especially true with respect to Ratio of Japanese expatriates and Position of local managers. That means few staff members are dispatched from Japan, and African managers hold high-level positions. This may indicate that factories with relatively simple processes can work smoothly under local management teams. Supporting that interpretation is the fact that outstanding human resources are more easily found in areas with insufficient industrial development, with local governments tending to assist in the process. Another likely factor is that Japanese parent companies place low strategic priority on the region and hence do not actively dispatch Japanese personnel. A likely reason for the half-hearted attitude of the parent companies is that Africa, like Latin America, tends to be perceived as a region that is most distant from Japan, both physically and psychologically.

2.3 Regional Comparisons through Four-Perspective Evaluation

Four-perspective evaluation is used here to investigate differences in the transfer patterns among the regions of the world. For this evaluation, 21 of the 23 Japanese system elements—excluding Process management and Delegation of authority—were divided into the two categories of *Human* and *Material*, and divided again into Japanese-style *Method* elements and Japanese-style *Result* elements (carried in and readymade). This provides a four-part matrix that reveals transfer patterns of the Japanese production system (Note 8). See Table 2.

Table 2. Arrangement of Japanese system elements for four-perspective analysis

	Human	Material
Method	I Work Organization and Administration (*all 6 elements*) IV Group Consciousness (*all 3 elements*) V Labor relations (*all 4 elements*)	II Production Control *Quality control, Maintenance* III Procurement *Procurement method*
Result	VI Parent-Subsidiary Relations *Ratio of Japanese expatriates,* *Position of local managers*	II Production Control *Equipment* III Procurement *Local content, Suppliers*

The average application scores for 9 regions in the world in each of the four quadrants are shown in Table 3. In this table, the two quadrants with higher transfer scores for each region are shaded light blue, and the two with lower scores are shaded yellow.

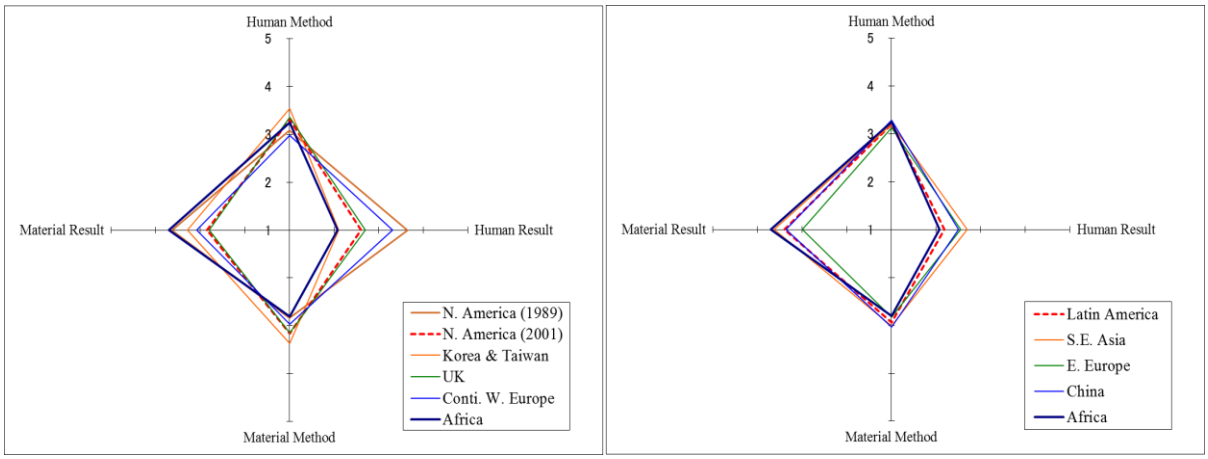

Figure 2. Four-perspective comparisons of hybrid factories worldwide

Table 3. Classification of transfer pattern by four-perspective analysis

		Human Method	Material Method	Human Result	Material Result
Developing Country Transfer Pattern	Africa	3.2	2.8	2.1	3.7
	Latin America (’06)	3.2	2.9	2.2	3.4
	Central & Eastern Europe (’03)	3.1	2.8	2.6	3.0
	Southeast Asia (’93)	3.2	3.0	2.7	3.6
	China (’02)	3.3	3.0	2.5	3.4
Result Transfer Pattern	North America (’89)	3.1	2.8	3.7	3.6
	Continental Western Europe (’98)	3.0	3.0	3.3	3.1
Method Transfer Pattern	North America (’01)	3.3	3.2	2.6	2.8
	United Kingdom (’97)	3.4	3.2	2.7	2.8
	Korea & Taiwan (’92)	3.5	3.4	2.1	3.3

From that display we find that the regional patterns of transference of the Japanese system fall into three general types: the Developing Country Transfer Pattern, with *Human-Method* and *Material-Result* aspects predominant; the Method Transfer Pattern with *Human-Method* and *Material-Method* aspects predominant; and the Result Transfer Pattern with *Material-Result* and *Human-Result* aspects predominant. Table 3 shows that the Japanese-affiliated hybrid factories of Africa match the Developing Country Transfer Pattern.

The Method Transfer Pattern that applies to Korea and Taiwan (1993), the UK (1997) and North America (2001)—relying on the transfer not of readymade resources that embody aspects of the Japanese system (equipment, parts, Japanese managers), but rather of the procedures and methods of the system—can be considered an ideal pattern for the transfer overseas of the Japanese production system, or perhaps the ultimate transfer pattern. This

pattern seems to originate in areas where the local environment is conducive to accepting the Japanese system (Korea & Taiwan 1993), while the differences observed in the 2001 and 1989 surveys of North America suggest that the pattern is also attainable through steady, long-term effort. For the UK (1997), as noted above, this pattern is likely to have resulted from policy changes on the national level (Abo, 2007).

The Result Transfer Pattern applies to North America (1989) and Continental Western Europe (1998). Due to social systems and cultural constraints that impede the transfer of the Japanese system, as well as the presence of solidly established local systems, a pattern has emerged of transferring the result aspects of the Japanese system while avoiding the transfer of the method aspects. In view of the differences between North America in 1989 and 2001, result-based transfer may also be regarded as a preliminary pattern that arises during the initial phase of offshore factory development by Japanese companies.

Finally, most of the developing regions fit the Developing Country Transfer Pattern in which the emphasis falls on *Human-Method* and *Material-Result* aspects. This pattern appears to arise from the characteristic circumstances of a developing area, where the short history of industrialization means there is no well-established local production system, and the local capacity for producing parts and machinery is weak. Africa certainly matches the Developing Country Transfer Pattern, and moreover in comparison to the other areas that fall into this pattern (Latin America 2006, Central and Eastern Europe 2003, Southeast Asia 1993, China 2002), Africa, with the lowest *Material-Method* score and the highest *Material-Result* score, is the quintessential example of the Developing Country Transfer Pattern. In that sense, the region that is closest to the African pattern is Latin America (2006), and yet there is still a big difference between those two regions in the *Material-Result* quadrant. A key feature of the African region, then, is that it is at the extreme of the *Material-Result* type of the Developing Country Transfer Pattern.

In this type, it is *Human-Method* aspects rather than *Human-Result* aspects which play the key role in the transfer of the Japanese production system, and it is worth noting that the *Human-Method* application scores in the Developing Country Transfer Pattern are generally lower than those in the Method Transfer Pattern and higher than those in the Result Transfer Pattern. An interesting corollary is that Africa and Latin America, with their legacies of European-influenced institutional blocks to the transfer of the *Human-Method* aspects of the Japanese system, turn out to be fertile ground for the transfer of Japanese-style procedures.

3. Case studies of Two Interesting Japanese-African Hybrid Factories

Among various interesting Japanese-African hybrid factories, here, we will take up two plants, Komatsu Southern Africa for an impressive Japanese style HRM, and Associated Vehicle Assemblers for their suggestive production management style**.**

3.1 Komatsu Southern Africa, Ltd. (KSAf)

This case shows an ideal “hybrid model” in a meaning that a Japanese style HRM is conducted by local managers in higher managerial positions. KSAf, a large distributing subsidiary of Komatsu, the world’s second largest maker of construction machinery, with

more than 1,000 employees at its offices and large-scale shops for repairing and maintenance in the Southern part of Africa, is basically managed by local top managers, introducing "Komatsu Ways", a well-combined "hybrid management" between Japanese and South African styles. After a local agency was established in 1963 in Johannesburg, KSAf was established as a company fully owned by the Komatsu group in 1997, and from that time until 2008, the management of the company was under a Japanese manager. 2008 saw the start of management under a local director (Managing Director). Up to the present, the unique Komatsu management style continues to be transferred, albeit while employing more than 1,000 employees and adapting itself to local managerial conditions with management ranks largely consisted of local personnel.

At this company, "Komatsu Ways" has been applied to the local management environment, and especially the importance was paid to the training of local people. It takes many forms, such as formal education at local schools, sending technicians to the global technical institutions of Komatsu in Japan, USA, Germany, and so on, and sending "every employee" to Japan. As the overall result of these practices, and a symbol of deep local commitment, the first local Managing Director, Mr. B, was appointed in 2008, supported mostly by the local management staff. It is impressive that the South African management people at Japanese companies seem to be more active in carrying out their roles, compared with local managers in South American or even Southeast Asian countries.

Also a thorough customer-oriented style is noticeable, from the customer service offices and workshops, to the 'Reman', a kind of small plant, for repairs and maintenances which are critical for construction machines.

So far this firm has been well organized as one of the most noteworthy, ideal Japanese-African hybrid models. Recently, however, it may be facing a challenging task, just like some cases in the electronics and automobile industries, for coping with severe competition against the firms of newly developing countries such as China and India, in the markets of "volume zone" or BOP (Base of the Pyramid). Typically, Caterpillar, the world's largest maker in this industry, is using its plants in India and China for importing construction machines and parts. Other challenges faced by many Japanese firms in South Africa, notably strong labor unions and BEE policy, have been flexibly coped with by Komatsu's local adaptability brought up exceptionally even in Japan.

3.2 Associated Vehicle Assemblers, Ltd (AVA)

What an interesting car assembler this is! AVA is a contract manufacturer of vehicles in Kenya, for six foreign auto makers. It is in a sense an "all round-player" for vehicle manufacturing, as a Japanese advisor there told us that the plant had produced almost all , except for a few, of the automobile models in the world. The authors had never seen such a plant, although having visited more than 200 auto plants around the world. AVA has a unique production management style suggestive for African vehicle factories.

AVA established in 1974 as a government-led project, and started production in 1977. It produced around 16,000 vehicles a year, with a peak in 1984. But, a big change of

government policy came, that is, liberalization of import duties of automobile including used cars in 1993, and full privatization of AVA in 1997. Now AVA is co-owned by two Kenyan import agency companies. As a result, in 2010, the number of used cars was 66,000 in total number of sales of about 80,000, and of the total of sold new vehicles, 10,000 were produced by Toyota, 1,500 by GM and 500 by Leyland, and about 2,500 by AVA.

At AVA, products are mainly truck type vehicles and number of employees was reduced to 250 in 2010 from 700 in 1985. All the vehicles are assembled by CKD method on three assembly lines. Almost all the parts and components are imported, mainly from Japan.

Each model is assembled weekly as a batch system. All the works are carried out manually, without any automated equipment or robots. Almost all the workers can adapt to any job of any process on the three lines, based on super multi-functional skills derived from long term employment. This way must be compatible to the Japanese production systems.

Administration of work organization is basically the same as in South Africa, in the sense of the national level European-style job grade system. But here also, a much larger discretionary area is seen to cope with small lot-large variety production, for example, OJT type training for multi-functional skills, using frequent job rotations at the three lines. Under such circumstance a sort of group consciousness and cooperative way of activities which are elements of Japanese system can be seen. In a sense, it could be also some influence of "harambee".

As a final remark, we can say that this type of contract manufacturing of vehicles is, for Japanese auto makers, one of the convenient ways of local production to get vehicles at an "appropriate" level of quality and cost for nearby local markets, with a minimum input of human and material resources. We could subsequently find another similar case of an "all round player": Willowvale Mazda Motor Industries in Zimbabwe. One of the authors was told at the interview, the present Willowvale Mazda used to do contract manufacturing of various vehicles of world car makers before the Zimbabwe government decided, in 1988, to produce Mazda cars only.

Judging from the above, we could visualize the possibility of an "African model" of vehicle production in a way of contract manufacturing. It is not a big factory for mass production, but a small and medium size for limited local markets. The Japanese style production system is generally good at managing such a flexible type of plant supported by multi-functional skilled workers trained on the shop floor. This kind of education and training of local human resources could contribute to Africa's gradual industrialization. Needless to say, there remain some crucial problems to be solved. CKD- contract manufacturing can contribute little in fostering the local suppliers-supply chains, as in the case of AVA.

4. Discussion: Applicability of the Japanese System in Africa

We have shown the results of the evaluation of the degree of transfer of the elements of Japanese management and production system, and two interesting cases, found in our African survey. Let's try here to point out the characteristic features and some implications of the results.

The applicability of the various elements of the Japanese management and production system can be observed in Africa, more than expected, at the local plants of the Japanese firms and even at some African firms. At the same time, however, in contrast of the apparent results, the overall performance such as substantial productivity (costs), quality and profitability, should be also taken into account.

4.1 General Applicability of human Related Japanese system

As seen in Table 3 and Figure 2 in section 2, as for *Human-Method* aspects the score (3.2) is around average among all the regions whereas *Human-Result*s (2.1) is among the lowest group as well as Latin America (2.2) and Korea-Taiwan (2.1), compared with the highest group such as North America (’89) (3.7) and Continental Western Europe (3.3).

The most significant feature from the viewpoint of transferring the Japanese management system regarding HRM, “worksite–orientedness”, an intensive and integrated expression of Japanese style management, is realized in various work practices at many plants. Flexible and cooperative ways of promotion practices, based on broad perspective knowledge and multi-functional skills, such as up-grading of positions for both blue- and white-collar workers, regardless of their school backgrounds, have been introduced in to the “Triple Heritages (Note 9)” of African society. In particular, the various cooperative ways of “how to work”, traditionally rooted in Africa, such as “harambee (All the members join together)” or “moral economy (Note 10)”, are often observed. It is not easy to point out clear Arabic or Islamic influences on hybrid situations. But, to some extent, serious ways of working hard are observed in the Mediterranean Sea areas, such as Egypt, Morocco and Tunisia.

It is especially interesting to learn that the Japanese hybrid situations of *Human-Method* aspects mentioned above are seen not only at Japanese transplants but also at European and American ones such as VW, Benz, Ford, and BMW (South Africa) and GM (Egypt and South Africa) and even at African ones such as Unga Feeds (Kenya), Centurion Systems, and DPI Plastics (South Africa). It is also noticeable to point out that those Japanese style practices have been implemented in many cases actively by local management people as shown in two cases in section 3.

In some meaning, this is not necessarily unexpected if taken into account the fact that the Japanese production system represented by Toyota as “Lean production system” (Womack et al., 1990), a kind of world standard of manufacturing technology, has been spread worldwide since the 1980s. However, this general applicability of Japanese human related management style to Africa, no matter what the origins of the company are, would strongly suggest that there is some compatibility or familiarity to Japanese managerial methods in African socio-cultural environment.

The situation described above is more or less related to the policy of local government, which shows “the pro-Japanese sentiments (Look East!)” regarding production technologies. Three examples can be taken up: one is the Kaizen Center (Productivity and Quality Improvement Center) set up by Egyptian government in corporation with JICA (Japan International Cooperation Agency) and the other two are the Productivity SA by South African government

and National Productivity Center by Nigerian government in cooperation with Japan Productivity Center. In addition, eight such type Productivity Centers in Africa including above two are organized as PAPA (Pan-African Productivity Association) (Note 11).

On the other hand, it should be strongly taken into consideration that the European style solid framework of work organization, in various aspects of the national level qualification system for promotion and rewards such as job ladder and job-based wage systems controlled by strong unions, is clearly seen almost everywhere in Africa we visited. It is also important to confirm that the Japanese systems have been somehow applied and adapted into such a framework which does not seem to fit.

Finally, it should be also notified that competition aspect of the typical Japanese HRM, another critical element of Japanese style qualification system based on ability, is generally weak in Africa. The motions of the operators, which must influence directly on efficiency and quality levels at shop floors, are more concretely slow and not very accurate. This situation means that the application of Japanese HRM in Africa is still on the way.

4.2 Low applicability of Material Methods (Material Related System) and Material Results Transfer

In the material aspect of the Japanese management system, on the other hand, the ways of local procurement of machines and parts have not been well transferred and those production elements are highly depending on outside Africa, mainly Japan. The score (3.7) of *Material-Result*s aspect is the highest, compared with the second highest group such as South East Asian region (3.6) and North America (’89) (3.6), whereas *Material-Method*s aspect (2.8) is among the same lowest group such as Central and Eastern Europe and North America (’89). This situation implies that the low applicability of material related Japanese system in the production site is complemented by the high level of transfer of *Material Results*, especially the components and parts from the parent company in Japan and other affiliates in various regions.

The above material aspect should be one of the most difficult problems in transferring of Japanese systems in Africa, together with the many other macro-scopic management environments as follows.

4.3 Overall Performance of Japanese Hybrid Factories in Africa

In evaluating the overall performance of Japanese hybrid factories in Africa, much higher wage cost and also national and regional frameworks strongly regulated and supported by the policies of governments or regional economic and political agreements should be taken into account.

Relatively high level of wage costs in Africa should be remarkable, compared with other developing regions, especially Asia. Minimum wage of South Africa (390 US$) especially is much higher than those of China (173), India (121), Russia (223), Brazil (286) though lower than Hungary (498), and Poland (628) (Note 12). Regarding actual average wages (US$/month) for general operators, according to JETRO (11 May, 2012 access), those of

Johannesburg (3,133), Lagos (154-222), Nairobi (154-222) and Cairo (247-795) are comparable to or even higher than those of Shanghai (China) (311) and Bangkok (Thailand) (263). These high wage costs must be heavy burden for foreign multinational companies in these African countries, along with the strict industrial relations with strong labor unions. The reasons for such high wage are not very clear so far but some can be pointed out: strong unions supported by governments, relatively overvalued foreign exchange rates pushed up by natural resource exports and tourism incomes, and closed economies resulted from the colonialism and present nationalist governments.

Now then, what about the overall substantial performance of the Japanese hybrid factories in Africa? We could collect a couple of useful information and data. The performances of almost all the Japan-based plants were somehow in the black though not very profitable. Another important data are export figures. Some factories of automobile and machinery industries were exporting their products: especially Toyota in South Africa exported more than half of cars manufactured there to Europe and YKK in Egypt, fasteners to the USA. One of the most difficult questions regarding the above performances would be the reason why those positive results were possible under the condition of the high wage costs. It might be possible by utilizing export subsidies, from the South African government for example, and various regional agreements for economic cooperation between African countries and EU, though we have not made sure such facts exactly so far. This should be one of the most significant tasks we have to intensively investigate from now on.

4.4 Regional Differences by Location within Africa

Just in addition to the above analysis and discussions, it is interesting to mention here the comparison of regional differences by location within Africa. In Northern Africa, such as Morocco and Tunisia, it is a good idea for Japanese multinationals to set up bases to export to Europe in taking advantages of relatively low wage level and high level of education as well as logistic closeness. And nowadays political stability has been increasing after “The spring of Arab”. Yet, quickly we have to add here the recent changing situation in safety threatened by Islamic-related terrorisms in this region, for example, a couple of serious terrorisms in Tunisia in 2015.

In Southern Africa, represented by South Africa, natural resource-led high economic growth has been realized despite of a distinct high level of wage and strong unions after the apartheid regime. In Eastern coast Africa, such as Kenya and Tanzania, not only with relatively high level of education and wage, but also under liberalized economies, it would not be so easy for Japanese multinationals to continue their local production. For example, AVA in Kenya is suffered from the liberalization of import of used cars as mentioned above (See 3.2) and Panasonic in Tanzania, from the liberalization of import of batteries. In Central West, such as Nigeria, even under the advantages of plentiful natural resources and large number of population, many Japanese companies, such as textile, motor cycle, metal workings, have been withdrawing from Nigeria since the 1990s mainly because of the political and social uncertainty as the results of racial antagonisms. Here also, recently the advantages of natural resources have been largely reduced because of sharp decline of prices of natural resources,

especially that of oil since the summer of 2014.

5. Concluding Remarks

In the above, we have shown the applicability of Japanese management and production system in Africa, using both the quantitative data measured by "Hybrid Evaluation Model" and the qualitative data of two case studies. Regarding the HRM, the most remarkable conclusion is that the African culture and social environment would be more or less compatible and familiar to Japanese style HRM. "Worksite–oriented" Japanese style management, in short, flexible and cooperative ways of work administration, has been realized to a considerable extent in various work practices at many plants in Africa, with a few Japanese expatriates. In addition, it is also noticeable that the Japanese human related system has been realized under some institutional restrictions, i.e. strong labor unions and rigid social framework, which might be originated from the European colonization.

On the other hand, in terms of material aspect, the most significant feature of Japanese hybrid factories in Africa is that the ways of local procurement of machines and parts have not been well transferred and those situations are complemented by the high ratio of the imported components and parts from mainly Japan.

In this sense, the Japanese hybrid factories in Africa could be expressed as an exaggerated shape of "*Developing Country Transfer Pattern*", which emphasize the *Human Method* and *Material Result* in transferring the Japanese management and production system.

Acknowledgement

The research is supported by JSPS KAKENHI Grant Number JP22402032, JP26301023.

References

Abo, T. (1989). The Emergence of Japanese Multinational Enterprise and the Theory of Foreign Direct Investment. In K. Shibagaki, M. Trevor, & T. Abo (Eds.), *Japanese and European Management* (pp. 3-17). Tokyo: University of Tokyo Press.

Abo, T. (1994). *Hybrid Factory: Japanese Production System in the United States*. New York: Oxford University Press.

Abo, T. (1998). Hybridization of the Japanese Production System in North America, Newly Industrializing Economies, South-East Asia, and Europe. In R. Boyer, E. Charron, U. Jurgens, & S. Tolliday (Eds.), *Between Imitation and Innovation: The Transfer and Hybridization of Productive Models in the International Automobile Industry* (pp. 216-230). New York: Oxford University Press.

Abo, T. (2007). *Japanese Hybrid Factories, A Comparison of Global Production Strategies*. Basingstoke: Palgrave-Macmillan. http://dx.doi.org/10.1057/9780230592964

Abo, T. (2010). *Competing Chinese and Foreign Firms in Swelling Chinese Economy: Competition Strategies for Japanese, Western and Asian Firms*. Berlin: LIT Verlag.

Abo, T. (2011). Nihon-gata Seisan Sisutemu no Kokusai Iten Kenkyu no Hensen-6 Tairiku no

Haiburiddo Kojo- (Transition of the Studies of International Transfer of the Japanese Style Production System –Hybrid Factories in Six Continents –translated as an un published English manuscript). *Kokusai Bijinesu Kenkyu, 3*(1), 103-118.

Abo, T. (2012). Global Operations of Japanese MNE's Hybrid Factories: Management Geography Framework. In R. D. Schlunze, N. O. Agola, & W. W. Baber (Eds.), *Spaces of International Economy and Management* (pp. 176-199). New York: Palgrave Macmillan. http://dx.doi.org/10.1057/9780230359550_10

Abo, T. (2015). Researching international transfer of the Japanese-style management and production system: Hybrid factories in six continents. *Asian Business and Management, 14*(1), 5-35. http://dx.doi.org/10.1057/abm.2014.13

Itagaki, H. (1997). *The Japanese Production System: Hybrid Factories in East Asia*. London: Palgrave Macmillan. http://dx.doi.org/ 10.1057/9780230592964_4

Kamiyama, K. (2005). *Kyodaika suru Chugoku Keizai to Nikkei Hybrid Kogyo* (Ever Growing Chinese Economy and Japanese Hybrid Plants). Tokyo: Jitsugyo no Nihon Sha.

Kawamura, T. (2011). *Hybrid Factories in the United States*. New York: Oxford University Press. http://dx.doi.org/10.1093/acprof:osobl/9780195311969.001.0001

Kenney, M., & Florida, R. (1994). *Beyond Mass Production*. New York: Oxford University Press.

Kumon, H., & Abo, T. (2004). *The Hybrid Factory in Europe: The Japanese Management and Production System Transferred*. Basingstoke: Palgrave Macmillan. http://dx.doi.org/10.1057/9780230523654

Mazrui, A. A. (1986). *The Africans: A Triple Heritage*. New York: Little, Brown & Company, Ltd.

Oliver, N., & Wilkinson, B. (1988). *The Japanization of British Industry*. Oxford: Blackwell.

Porter, M. (1990). *The Competitive Advantage of Nation*. New York: The Free Press. http://dx.doi.org/10.1007/978-1-349-11336-1

Sugimura, K. (2004). *Afurika Nohmin no Keizai* (Economy of African Peasantry). Tokyo: Sekai Shisou Sha.

Trevor, M. (1983). *Japan's Reluctant Multinationals: Japanese Management at Home and Abroad*. New York: St Martin's Press.

Wada M., & Abo, T. (2005). *Chuutou'ou no nihongata keiei seisan shisutemu – pourando, surobakia de no juyou* (Japanese Management and Production System in Central and Eastern Europe: Applicability in Poland and Slovakia). Tokyo: Bunshindo Publishing Corporation.

Womack, J. P., Jones, D. T., & Roos, D. (1990). *The Machine that Changed the World*. New York: Rowson Associates and Palgrave Macmillan. http://dx.doi.org/ 10.1057/jibs.1991.40

Yamazaki, K., Juhn, W., & Abo, T. (2012). *Hybrid Factories in Latin America: Japanese*

Management Transferred. Basingstoke: Palgrave Macmillan. http://dx.doi.org/10.1057/9781137287007

Yuan, Z. J. (2006). *Chuutou'ou no nikkei haiburiddo koujou* (Japanese Hybrid Factory in Central and Eastern Europe). Tokyo: Toyo Keizai Shimposha.

Notes

Note 1. In addition to the manufacturing factories, JMNESG conducted on-site surveys at African facilities affiliated with Japanese trading companies and Japanese mineral and energy resource enterprises. They are actively doing their businesses mainly in natural resource related industries in Africa, and we could find some aspects of Japanese system in them. But, they are excluded from the analysis presented in this paper, because it is not possible to score them using the Hybrid Evaluation Model which was developed specifically for the manufacturing company.

Note 2. For the details of the result analyzed by Hybrid Evaluation Model for each survey, see Abo (1994) for the first North America Survey (1989), Kawamura (2011) for the second North America Survey (2000-2001), Yamazaki et al. (2009) for the Latin America Survey (2001 and 2006), Itagaki (1997) for the Korea-Taiwan Survey (1992) and the Southeast Asia Survey (1993), Kamiyama (2005) and Abo (2010) for the China Survey (2002), Kumon and Abo (2004) for the UK and Continental Western Europe Survey (1997-1998), and Wada and Abo (2005) and Yuan (2006) for the Central and Eastern Europe Survey (2003).

Note 3. See Abo (1994).

Note 4. The first region surveyed was North America, and when the study was extended to Asian and European regions, the evaluation criteria remained basically consistent, although slight revisions were made to the standards for certain items in order to reflect particularities of the Asian and European versions of hybridization. The criteria of this paper are basically based on European version (Kumon & Abo, 2004).

Note 5. For the details of the criteria, see Kumon and Abo (2004), Appendix 1-1, pp. 19-31.

Note 6. The score for First-line supervisor becomes higher when first-line supervisors are internally promoted and participate not only in labor management but also in the management of work teams (examining daily production plans, assigning jobs, analyzing operational situations, securing parts and materials, and overseeing education and training) and in the technical control of production processes (setting up work standards and overseeing equipment maintenance, quality control and kaizen activities).

Note 7. This means the ratio of local content is low and the parts and components are mainly procured from Japanese suppliers in Japan, Africa, and other regions in the world.

Note 8. For details of Four-perspective evaluation, see Abo (1994).

Note 9. Mazrui (1986).

Note 10. “Moral economy” was illuminated by Hyden, G. and so on. (introduced by Sugimura (2004)).

Note 11. See the homepage of PAPA (http://www.pa-pa.co.za/).

Note 12. ILO, Global Wage Report 2010/11